

Final

Evaluation of Per- and Polyfluoroalkyl Substances in Groundwater, Outlying Landing Field Coupeville

Naval Air Station Whidbey Island Oak Harbor, Washington

May 2018

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FINAL TECHNICAL MEMORANDUM

Evaluation of Per- and Polyfluoroalkyl Substances in Groundwater, Outlying Landing Field Coupeville Naval Air Station Whidbey Island, Coupeville, Washington

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DATE:

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This evaluation describes the results of a groundwater investigation for Per and Polyfluoroalkyl substances (PFAS) at Outlying Landing Field (OLF) Coupeville, Naval Air Station (NAS) Whidbey Island, in Coupeville, Washington. The objectives of this investigation were to do the following: a) refine the understanding of groundwater flow at the OLF, and b) confirm the presence of PFAS in groundwater and characterize their nature, if present. CH2M HILL, Inc. (CH2M) prepared this document under the Department of the Navy (Navy), Naval Facilities Engineering Command, Comprehensive Long-term Environmental Action—Navy 9000 Contract N62470-16-D-9000, Contract Task Order 08.

Site Background and Description

OLF Coupeville is a military airfield associated with NAS Whidbey Island. The OLF is located 2 miles southeast of the Town of Coupeville, Washington, in Island County (Figure 1), and is located on a broad plateau of Smith Prairie in central Whidbey Island at an elevation of approximately 195 feet above mean sea level (amsl). The paved runway is approximately 5,400 feet long and is bordered by grass maintained by mowing operations extending to the public roads (Navy, 1994). A runway safety area extends approximately 3,300 feet south of the runway footprint and is bordered by trees and residential parcels (Figure 2). OLF Coupeville was commissioned for use by the Navy in 1943, and provides support for day and night Field Carrier Landing Practice operations by the Navy for aircraft based out of NAS Whidbey Island. Such operations allow aviators and crew to fly in patterns as well as practice touch-and-go, simulating carrier landings and take offs.

PFAS are found in aqueous film-forming foam (AFFF) compounds used in Navy firefighting activities. There is no available documentation that AFFF was used at the OLF Coupeville. However, several PFAS were recently detected in a sample collected from an onbase drinking water supply well in November 2016. This served as confirmation that AFFF was historically used/released at the site and this prompted initiation of off-site drinking water sampling and the on-site investigation. Suspected source areas include the runway and buildings located east and west of the runway.

Geologic Setting

Surficial geology at OLF Coupeville consists of the Partridge Gravel, which is composed of sand, gravel, and sandgravel mixtures with minor inter-layered silt and silty sand. This unit was deposited by glacial meltwaters as a coarsening-upward, marine, kame-delta–turbidite complex (Polenz et al., 2005). Bedding planes in the formation generally dip toward the west in the vicinity of OLF Coupeville. Undivided Pleistocene deposits lie beneath the Partridge Gravel. These deposits consist of poorly sorted, mildly compact sands.

Field Activities Summary

The following field activities were performed as part of this investigation:

- Monitoring well installation
- Groundwater level survey and transducer study
- Groundwater sample collection

The following sections detail the field activities that were completed between November 2016 and March 2017.

Monitoring Well Installation

Twenty-seven groundwater monitoring wells were installed between November 28, 2016 and February 14, 2017, ranging in depth from 106 feet below ground surface (bgs) to 237 feet bgs. Wells were installed using sonic drilling techniques in accordance with the Standard Operating Procedure (SOP) *Installation of Monitoring Wells by Sonic Drilling*, included in the Sampling and Analysis Plan (SAP) (CH2M, 2017). Locations of groundwater monitoring wells are shown on **Figure 2**. Well construction details are included in **Table 1**. Soil boring logs are included as **Attachment 1**.

Because of the presence of shallow perched zones of groundwater, it was necessary to use isolation casings to limit potential cross-contamination during well construction. To install isolation casing, the deeper well at each location was advanced to the depth of the isolation seal using 8-inch diameter casing. The depth of isolation seal was determined based on geology and consultation with the licensed professional hydrogeologist, selecting to seal off a confining unit or material above the aquifer unit of interest for screening. A seal comprised of hydrated bentonite pellets was installed within the 8-inch diameter casing, after which the remainder of the borehole was drilled from the depth of the isolation casing using 6-inch diameter casing to the target screen depth. Continuous soil cores were collected for lithologic classification and screened for volatile organic compounds (VOCs) using a photoionization detector. Soil cores were closely examined for signs of saturation and the presence of fine-grained beds that could indicate the presence of perched groundwater conditions. For the shallower, second borehole at each nested well location, the entire depth of the borehole was advanced using 6-inch diameter casing with no isolation casings.

Each monitoring well was constructed of 2-inch inside-diameter polyvinyl chloride (PVC) riser with centralizers at 20-foot intervals connected to a 2-inch inside-diameter factory-slotted, PVC screen with a bottom cap. Schedule 40 PVC casing and screen were used for shallow and intermediate wells (those with screen bottom elevations greater than mean sea level). Schedule 80 PVC casing and screen was used for deep wells (those with screen bottom elevations less than mean sea level). Additionally, 5 feet of solid casing was installed below the screen interval to serve as a sump for deep wells. Ten feet of screen was used for all wells, with the exception of WI-CV-MW12-S, which was installed with 15 feet of screen to facilitate communication with the perched saturated zone identified during borehole advancement. Well construction information is included in **Table 1**.

A silica sand filter pack was placed around the annular space of the well screen from the bottom of the boring and extended to a minimum height of 2 feet above the top of the well screen. A bentonite seal, at least 2 feet thick, was placed above the top of the sand pack. After the bentonite had been hydrated, bentonite grout was placed in the remaining annular space.

All monitoring wells were finished with flush-mount completions that included a metal well vault and concrete pad. A locking watertight cap was placed on the PVC pipe and the wells were labeled on the exterior of the well vault with a metal stamp indicating the well identification.

Groundwater monitoring wells were developed concurrently with installation starting January 25, 2017 and ending on February 20, 2017. Wells were developed using surge and purge methods using a stainless-steel bailer, submersible pump, and a pneumatic lift. Water quality parameter (WQP) measurements (pH, temperature, conductivity, and turbidity) and observations were done periodically to monitor development. Wells were considered developed once water quality parameters stabilized or until 4 hours of development had passed, whichever occurred first. All wells were developed based on the above criteria with the exception of wells that experienced insufficient recharge during development. The wells that were not developed to the criteria specified included WI-CV-MW05-S, WI-CV-MW09-S and WI-CV-MW11-S. While WI-CV-MW12-S was developed in accordance with the criteria, the water level for this well was near the bottom of the screened interval at the start of development and one well volume was calculated to be only 0.42 gallons. This well was purged dry several times during development and while measured parameters were stable, the well ultimately did not recharge for sample collection. This lack of recharge may indicate that water removed during development was added during sonic drilling operations and the well itself is not within a water bearing zone. Development logs are included as **Attachment 2**.

Monitoring wells were surveyed by a professional land survey licensed in Washington. The survey report is included as **Attachment 3**.

Groundwater Sample Collection

Groundwater samples were collected between February 20, 2017 and March 4, 2017. Groundwater samples were collected from monitoring wells under low flow and low stress conditions, with the sample pump intake placed at the middle of the well screen interval. In accordance with the SAP, the pumps used were PFAS-free pneumatic pumps operated by compressed air, which is essentially a bladder-less bladder pump, in which the air does not come into contact with the air and water interface.

Depth to water readings and WQPs (specific conductance, pH, turbidity, temperature, dissolved oxygen, and oxidation-reduction potential) were measured and recorded approximately every 5 minutes before sampling using a water quality meter, calibrated daily (at a minimum). If excessive drawdown was created at the minimum acceptable flow rate for low flow and low stress sampling conditions, the pump intake was raised to within a few feet of the top of the water column and a minimum of three well volumes was purged. If the well went dry before purging three well volumes, a sample was collected after recharge had taken place within 24 hours of purging.

WQPs were considered stabilized for three consecutive readings, as follows:

- Temperature remained constant
- pH was within 0.1 pH units
- Conductivity was within 10 percent
- Turbidity measurements were less than 10 nephelometric turbidity units or agreed within 10 percent

Groundwater sample locations are shown on **Figure 2**. Stabilized WQPs recorded before sample collection are presented in **Table 2**. Depth-to-water, WQPs, and total well depth measurements were recorded on Groundwater Sampling Data Sheets included as **Attachment 4**.

During sample collection, sample containers were filled in such a manner so as to minimize aeration of the samples. Quality control (QC) samples were collected at a rate of one duplicate sample for every 10 samples for field duplicates and one matrix spike/matrix spike duplicates sample for every 20 samples collected. One equipment rinsate blank sample was collected each day of sampling from decontaminated or disposable equipment.

Groundwater samples were shipped in an ice-chilled cooler under chain-of-custody protocols to Vista Laboratories in El Dorado Hills, California, a National Environmental Laboratory Accreditation Program-accredited laboratory. Groundwater samples were analyzed for perfluorooctanoic acid (PFOA), perfluorooctane sulfanate (PFOS), and perfluorobutanesulfonic acid (PFBS) via United States Environmental Protection Agency (USEPA) Method 537 (Modified).

Investigation-derived Waste Management and Disposal

Wastes generated during the field activities were characterized as investigation-derived waste (IDW) and managed in accordance with the SAP and applicable SOPs. Solid IDW generated from soil cuttings was containerized in four 20 cubic yard roll-off boxes with lids, inner plastic liners, and outer secondary containment. Additional soil IDW was containerized in 30 stainless steel drums placed on wooden pallets and within secondary containment. Liquid IDW, which included well development and purge water, decontamination water, and residual drilling mud was stored in two 20,000-gallon steel fractionation tanks within secondary containment. Soil and aqueous IDW was sampled for waste characterization (PFAS; Toxicity Characteristic Leaching Procedure VOCs, semivolatile organic compounds, pesticides, and polychlorinated biphenyls ; total Resource Conservation and Recovery Act of 1976 metals plus copper, nickel, and zinc; total cyanide; corrosivity; ignitability). Waste has been characterized as nonhazardous and is not considered a dangerous waste (State of Washington Dangerous Waste Regulations WAC 173-3030) and is currently awaiting disposal.

Groundwater Elevation Study

A groundwater elevation study was conducted from March 3 through March 20, 2017, which consisted of collection of groundwater measurements using water level meters as well as pressure transducers at the newly installed groundwater monitoring wells.

Groundwater level measurements were collected twice at all monitoring wells: March 3, 2017 and March 18, 2017. Groundwater-level measurements were collected from all of the monitoring wells within a 4-hour period, with the exception of the initial measurement at monitoring well WI-CV-MW06-M. Because of limited accessibility, the groundwater-level measurement was collected from WI-CV-MW06-M on March 6, 2017. Groundwater levels were measured manually at all wells using a water level indicator to the nearest 0.01 foot from the top of the survey point on the PVC-riser casing. Groundwater elevations collected during the hydrogeological study are presented in **Table 3**. Hydrographs generated from transducer data are included in **Attachment 5**.

The study also collected data using pressure transducers to collect measurements over a 48-hour period in groups of six wells. Transducers used were vented water-level data loggers with a vented design to allow for automatic atmospheric pressure compensation. The data loggers recorded water level, water pressure, and temperature, and were programmed to collect measurements at 1-minute intervals to determine if there was any effect on the water table from surrounding domestic water well pumping, tidal influx, and during periods of onsite water well use (weekdays) and nonuse (weekends). Once deployed in a well, the data loggers remained for a minimum 48-hour period. Six total data loggers were used and were deployed in wells that were in relative close proximity. The following well clusters were evaluated simultaneously:

- WI-CV-MW12-D and WI-CV-MW12-S
- WI-CV-MW10-D, WI-CV-MW10-M, WI-CV-MW06-M, WI-CV-MW06-S, WI-CV-MW05-S, and WI-CV-MW05-M
- WI-CV-MW09-M, WI-CV-MW13-S, WI-CV-MW13-M, WI-CV-MW14-M, WI-CV-MW04-S, and WI-CV-MW04-M
- WI-CV-MW11-M, WI-CV-MW11-S, WI-CV-MW07-S, WI-CV-MW07-M, WI-CV-MW08-S, and WI-CV-MW08-M
- WI-CV-MW01-D, WI-CV-MW01-M, WI-CV-MW02-S, WI-CV-MW02-M, WI-CV-MW03-M, and WI-CV-MW03-D

Hydrographs were created from the water-level measurements collected by the Level TROLLs from each well. The water levels were converted to groundwater elevation (based on the surveyed elevation at each well) and were plotted compared with tide elevation predictions for Admiralty Head, located to the southwest of the site (NOAA, 2017). Groundwater elevations were evaluated for tidal influences and for influences because of possible

pumping of onsite wells or the nearby Town of Coupeville water supply well, located approximately 700 feet to the west of the northern edge of the runway.

Deviations from the Sampling and Analysis Plan

The following list summarizes deviations from the SAP (CH2M, 2017) during the field investigation activities and justification for those deviations:

- Middle and deep zone monitoring wells were installed at elevations relative to the mean sea level and depths of private drinking water wells, while screen intervals identified in the SAP were based on existing documentation and research of existing soil borings and wells. The depths specified in the SAP were not always consistent with a water-bearing zones observed in the field. Additionally, according to the Island County Water Resources Advisory Committee, 95 percent of wells on record within one-mile of the OLF Coupeville boundary have bottom depths in the interval between 25 and -100 feet amsl. During borehole advancement, observations were made based on soil type and saturation to determine the appropriate installation depth and number of wells installed at each location. Where practical based on lithology, middle and deep zone monitoring well screened intervals were selected to bias the interval in which most water supply wells were installed, while also adding a preference for installation in more transmissive units.
- Schedule 80 PVC casing and screens with 20-foot spaced centralizers were used at deep wells to increase the rigidity during installation to maintain well integrity.
- Five feet of solid casing connected below the screen interval as a sump was installed to assist with well development and the removal of sediment from the well casing.
- Ten feet of screen was used for all wells installed with the exception of WI-CV-MW12-S, which was installed with 15 feet of screen to facilitate communication with the perched saturated zone identified during borehole advancement.
- Bentonite grout was used for the annular seal during well construction instead of a cement-bentonite mixture because of the complications from colder temperatures during installation. There are no specific cement requirement for well installation in the State of Washington.
- One hour of well development was proposed; however, because of the turbidity of the groundwater observed during development, well development was increased to 4 hours to allow for adequate development.
- During groundwater sampling, excessive drawdown was observed during purging. Wells that went dry were sampled within 24 hours of purging after recharge had occurred. This additional contingency procedure was not described in the SAP.

Data quality and usability was not affected by these deviations.

Updated Conceptual Site Model

No prior environmental investigations at OLF Coupeville have been conducted; as such, the conceptual site model (CSM) provided in the SAP (CH2M, 2017) was based on existing documentation from Island County (Island County, 2005) and from the United States Geological Survey (Sapik et al., 1988). Based on the lithological findings during the well installation as well as the groundwater elevation study, the CSM was updated with site-specific information and observations. Lithology at OLF Coupeville consists of heterogeneous glacial deposits of gravel, sand, silt, and clay. Lithology observed is consistent with the previous mapping by Polenz et al. (2005) and described in the Geologic Setting section of this document. Cross sections have been developed to evaluate the comprehensive site hydrogeology and are shown on **Figures 3** through **7**. These mixed deposits are distributed in beds of inconsistent thickness across the site, which complicates identification of distinct hydrogeologic units.

The first encountered groundwater in the northern portion of the site is present in perched zones between 90 and 130 feet bgs. At this interval, a discontinuous clay and silt layer is encountered, which pinches out in the southern

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portion of the site. The underlying "middle zone" is semi-confined, with confined conditions in portions of the northern portion of the site and unconfined conditions in the southern portion, in the vicinity of WI-CV-MW10-M and WI-CV-MW12-S/D. The "middle zone" ranges in thickness from just a few feet to greater than 50 feet. The potentiometric surface for the "middle zone" is at approximately 60 to 85 feet amsl, or 120 to 130 feet bgs. A heterogeneous clay, claystone, and silt confining layer underlies the "middle zone." Organic material (for example, plant material and peat) was frequently logged in this interval. Transmissive sandy zones are present within and beneath the organic silt and clay unit. Borings completed at the site were typically terminated in the organic clay zone or sandy zones within or beneath it. For the purpose of this assessment, these sandy zones are considered the "deep zone."

The average range in groundwater elevation fluctuations in each well over the 48-hour period during the transducer study was 0.6 feet or less, which is not large enough to significantly impact groundwater flow direction at the site. The deep wells (WI-CV-MW01-D, WI-CV-MW03-D, WI-CV-MW10-D, and WI-CV-MW12-D) show a clear semidiurnal tidal influence, with water elevations mimicking the predicted tide elevations. Two of the middle-zone wells (WI-CV-MW06-M and WI-CV-MW08-M) show a weaker semidiurnal tidal influence. A potential response to nearby pumping, likely of the Town of Coupeville Keystone well, is observed with daily periods of drawdown observed in the water levels observed at WI-CV-MW14-M. Pumping records have not been obtained for the Town of Coupeville well. Most of the remaining wells show daily fluctuations that appear to correlate with barometric pressure fluctuations. The hydrographs for each well and for groups of wells evaluated simultaneously demonstrate these patterns (**Attachment 5**).

Groundwater contour maps have been generated for the middle and deep zones, included as **Figures 8** and **9**, respectively. Because the perched, shallow zone is discontinuous across much of the site, no contour map for this unit was generated. The dominant flow direction in the middle zone is to the southwest in the northern portion of the site, shifting to the south-southeast in the southern portion of the site. Groundwater flow in the deep zone is to the south.

In general, the overall groundwater flow direction appears to be consistent regardless of tidal influence.

Sampling Results Summary

Groundwater sample results are presented in **Table 4** and shown on **Figure 10**. Comprehensive laboratory results are presented in **Attachment 6**. The following is a summary of the groundwater sampling results from samples collected in February and March 2017:

- **PFBS** PFBS was detected in seven samples, ranging from an estimated 3.07 nanograms per liter (ng/L) in the sample collected from WI-CV-MW10-M to 473 ng/L in the sample collected from WI-CV-MW05-M. None of the detections of PFBS exceeded the Regional Screening Level (USEPA, 2017) of 400,000 ng/L (based on a hazard quotient of 1.0).
- PFOS PFOS was detected in five samples ranging from an estimated 0.844 ng/L in the sample collected from WI-CV-MW07-M to 54.7 ng/L in the sample collected from WI-CV-MW02-S. There were no detected concentrations that exceeded the USEPA lifetime health advisory (LHA) of 70 ng/L for PFOS.
- PFOA PFOA was detected in five samples, ranging from 9.87 ng/L in the sample collected from WI-CV-MW05-S to 1,190 ng/L in the sample collected from WI-CV-MW05-M. Three samples collected from wells WI-CV-MW02-S, WI-CV-MW05-M and WI-CV-MW14-M exceeded the LHA of 70 ng/L for PFOA.

The highest combined PFOA and PFOS concentration in the intermittent shallow/perched aquifer was 626 ng/L, in the sample from WI-CV-MW02-S. This was the only detection in shallow/perched zone that exceeded the LHA for the total concentration of PFOA plus PFOS (70 ng/L). This location may represent a source area. The highest detection was of PFOA at a concentration of 1,190 ng/L in the sample collected from WI-CV-MW05-M. PFAS concentrations in WI-CV-MW05-S, the shallow well for this well pair, were significantly lower with no exceedances of the LHA (**Figure 10**), indicating a possible upgradient source and potential transport pathway between the shallow/perched and middle zone (which could not be positively confirmed with the existing well network).

PFAS contamination was most widespread in the middle aquifer zone, compared to the shallow/perched and deeper zones. In addition to the elevated concentration in the sample from WI-CV-MW05-M, the combined PFOA and PFOS concentration in the sample from WI-CV-MW14-M also exceeded the LHA at 167 ng/L. Detections of one or more PFAS were noted in WI-CV-MW09-M, WI-CV-MW10-M, and WI-CV-MW13-M. With the exception of a PFOS detection of 0.914 J ng/L at WI-CV-MW03-D, there were no detections of PFAS in the deep zone aquifer.

Data Validation

Data validation was performed on groundwater samples collected February 20 through March 4, 2017 from OLF Coupeville. The data validation report is included in **Attachment 7**. The data validation included a review for systematic errors or patterns that are found in the distribution of data qualifiers.

Select PFAS were analyzed by USEPA Method 537 (modified) as specified in the SAP (CH2M, 2017). The data packages were then reviewed by an independent data validator on the basis of the criteria outlined by *National Functional Guidelines for Superfund Organic Data Review* (USEPA, 2016). Excluding field QC samples, 84 distinct data points were generated, and six results were qualified with J-qualifiers (because of the low sample concentrations) or U-qualified (because of blank contamination).

All results are usable as qualified. The overall conclusion is that the dataset generated is acceptable and appropriate for its intended use.

Conclusions and Recommendations

Geologic borings collected as part of this investigation indicated surficial geology composed of sand, gravel, and sand-gravel mixtures with minor inter-layered silt and silty sand, consistent with the Partridge gravel as described in mapping completed by Polenz et al. (2005). Where practical based on lithology, middle and deep zone monitoring well screened intervals were selected to bias the interval in which most water supply wells were installed, while also adding a preference for installation in more transmissive units. Groundwater flow beneath OLF Coupeville is to the south (**Figure 9**), which is consistent with the offbase drinking water results; detections of PFAS and exceedances of the LHA in offbase drinking water were due south of the OLF.

An evaluation of the historical use of AFFF at OLF Coupeville is recommended, to include a desktop review of historical documents as well as interviews with current and former OLF personnel. Additional site characterization is recommended, to include an assessment of PFAS concentrations south of WI-CV-MW05-M and WI-CV-MW10 clusters to evaluate the likely offsite transport pathways in both the middle and deep depth intervals, as well as slug testing and effective porosity testing (to evaluate groundwater flow velocity). Additional source identification efforts may be warranted in the central portion of the base, upgradient of the WI-CV-MW05 well pair. Identification of a source area may be complicated by the intermittent nature of the shallow/perched zone, which increases the probability of installation of dry wells or wells that may periodically go dry depending on precipitation and recharge rates that are dependent on weather conditions. Soil samples and direct-push technology groundwater samples are recommended to address data gaps in source area identification. Proposed groundwater sampling locations for future investigations in order to fill the data gaps discussed herein are included on **Figure 11**.

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Tables

Monitoring Well Construction Summary

Evaluation of Per- and Polyfluoroalkyl Substances in Groundwater Outlying Landing Field Coupeville, Naval Air Station Whidbey Island Coupeville, Washington

Monitoring Well	Installation Date	Ground Elevation (ft msl)	Top of PVC Casing Elevation (ft msl)	Total Well Depth (ft bgs)	Measured Total Well Depth (ft btoc)	Length of Screen (ft)	Length of Sump (ft)	Depth of Top of Screen (ft bgs)	Depth of Bottom of Screen (ft bgs)	Elevation of Top of Screen (ft msl)	Elevation of Bottom of Screen (ft msl)	Pump Intake Depth (ft btoc)	Screened Aquifer	Northing (feet NAD83)	Easting (feet NAD83)
Site Investigation															
WI-CV-MW01-D	12/8/2016	194.99	194.58	217.42	217.00	10	5	202.00	212.00	-7.01	-17.01	207.00	D	439604.95	1202430.71
WI-CV-MW01-M	12/13/2016	194.97	194.61	163.36	163.00	10	5	148.00	158.00	46.97	36.97	153.00	М	439611.38	1202426.49
WI-CV-MW02-M	12/20/2016	193.57	193.11	167.96	167.50	10	5	152.50	162.50	41.07	31.07	157.50	М	439065.11	1202358.17
WI-CV-MW02-S	1/4/2017	193.53	193.17	106.86	106.50	10	5	91.50	101.50	102.03	92.03	100.00	S	439062.88	1202352.24
WI-CV-MW03-D	1/9/2017	193.49	193.07	237.43	237.00	10	5	222.00	232.00	-28.51	-38.51	227.00	D	439391.27	1201759.66
WI-CV-MW03-M	1/13/2017	193.50	193.14	160.36	160.00	10	5	145.00	155.00	48.50	38.50	150.00	М	439397.60	1201756.79
WI-CV-MW04-M	1/27/2017	193.54	193.19	159.05	158.70	10		148.70	158.70	44.84	34.84	153.00	М	440483.04	1201341.55
WI-CV-MW04-S	1/31/2017	193.53	193.20	126.93	126.60	10	5	111.60	121.60	81.93	71.93	116.60	S	440487.00	1201338.34
WI-CV-MW05-M	2/7//2017	190.99	190.64	175.35	175.00	10	5	160.00	170.00	30.99	20.99	165.00	М	438254.53	1201503.60
WI-CV-MW05-S	2/12/2017	190.93	190.38	124.56	124.00	10		114.00	124.00	76.93	66.93	122.00	S	438248.04	1201506.33
WI-CV-MW06-M	2/7/2017	198.38	197.87	189.51	189.00	10	5	174.00	184.00	24.38	14.38	179.00	М	437400.58	1202641.22
WI-CV-MW06-S	2/8//2017	198.40	197.97	140.43	140.00	10		130.00	140.00	68.40	58.40	138.00	S	437394.46	1202643.62
WI-CV-MW07-M	1/24/2017	200.32	199.57	193.75	193.00	10	5	183.00	193.00	17.32	7.32	185.00	М	441202.27	1200339.00
WI-CV-MW07-S	1/27/2017	200.54	200.02	145.02	144.50	10	5	129.50	139.50	71.04	61.04	139.00	S	441209.76	1200340.48
WI-CV-MW08-M	2/13/2017	205.42	205.21	165.21	165.00	10	5	150.00	160.00	55.42	45.42	155.00	М	441676.52	1202808.83
WI-CV-MW08-S	2/14/2017	205.53	205.17	131.26	130.90 ¹	10		120.90	130.90	84.63	74.63	125.00	S	441676.84	1202815.43
WI-CV-MW09-M	12/15/2016	187.55	187.23	197.33	197.00	10	5	182.00	192.00	5.55	-4.45	187.00	M	436991.02	1200530.74
WI-CV-MW09-S	12/21/2016	187.57	187.15	110.92	110.50	10	5	95.50	105.50	92.07	82.07	NA	S	436988.92	1200524.67
WI-CV-MW10-D	1/19/2017	188.62	188.25	206.67	206.30	10	5	191.30	201.30	-2.68	-12.68	196.00	D	436180.75	1203179.80
WI-CV-MW10-M	1/23/2017	188.58	188.33	159.45	159.20	10	5	144.20	154.20	44.38	34.38	150.00	M	436186.13	1203182.90
WI-CV-MW11-M	2/5/2017	202.57	202.14	170.43	170.00	10	5	155.00	165.00	47.57	37.57	157.80	M	443696.16	1199632.00
WI-CV-MW11-S	2/8/2017	202.44	202.01	140.43	140.00	10		130.00	140.00	72.44	62.44	138.00	S	443692.06	1199626.40
WI-CV-MW12-D	1/27/2017	187.28	186.85	198.03	197.60	10	5	182.60	192.60	4.68	-5.32	190.00	D	433269.90	1204130.83
WI-CV-MW12-S	1/31/2017	187.38	186.97	106.92	106.50	15		91.50	106.50	95.88	80.88	NA	S	433273.82	1204137.37
WI-CV-MW13-M	1/6/2017	189.37	189.11	187.76	187.50	10	5	172.50	182.50	16.87	6.87	177.50	М	437627.11	1200713.17
WI-CV-MW13-S	1/9/2017	189.56	189.28	114.98	114.70	10		104.70	114.70	84.86	74.86	NA ²	S	437634.55	1200712.10
WI-CV-MW14-M	1/23/2017	191.95	191.61	176.34	176.00	10	5	161.00	171.00	30.95	20.95	164.00	М	439885.76	1200752.61

Notes:

¹ - Total depth measurement after well development on 02/17/2017.

² - Groundwater sample collected using a disposible bailer due to insufficient water column.

NAD 83 - Washington State Plane Coordinate System, North Zone NAD83-11

-- = No sump used in well construction

bgs = below ground surface

btoc = below top of casing

D = deep aquifer

ft = feet

M = middle/intermediate aquifer

msl = mean sea level

NA = not applicable

Water Quality Parameters

Evaluation of Per- and Polyfluoroalkyl Substances in Groundwater Outlying Landing Field Coupeville, Naval Air Station Whidbey Island Coupeville, Washington

			Depth to				Dissolved		
		Sample	Water (ft		Conductivity	Temperature	Oxygen	Oxidation- Reduction	Turbidity
Station ID	Sample Date	Time	btoc)	рН	(mS/cm)	(°C)	(mg/L)	Potential (mV)	(NTU)
WI-CV-MW01-D	2/28/2017	14:00	141.8	7.93	0.375	9.44	2.02	-67	
WI-CV- MW01-M	2/28/2017	11:00	124.4	7.73	0.558	9.23	2.85	10	0.0
WI-CV-MW02-M	3/1/2017	13:55	123.8	7.69	0.599	9.64	1.75	-20	
WI-CV-MW02-S	3/1/2017	11:00	92.73	7.38	0.667	8.18	2.80	168	
WI-CV-MW03-D	2/27/2017	17:05	143.26	7.39	0.534	6.75	2.53	-78	
WI-CV-MW03-M	2/27/2017	13:15	123.05	7.73	0.380	7.84	3.09	116	
WI-CV-MW04-M	2/28/2017	10:00	125.60	8.31	0.387	10.96	8.31	-157	26.7
WI-CV-MW04-S	3/1/2017	13:25	115.10	6.55	0.485	10.98	11.06	202	12.1
WI-CV-MW05-M	2/23/2017	15:45	123.60	8.41	0.355	11.40	8.75	179.8	96
WI-CV-MW05-S	2/24/2017	17:30	121.50	8.29	0.379	9.09	13.90	161.3	167
WI-CV-MW06-M	2/21/2017	14:25	145.45	7.08	0.634	11.65	0.81	-95	0.0
WI-CV-MW06-S	2/22/2017	12:05	134.95	7.28	0.596	12.50	2.95	201	0.0
WI-CV-MW07-M	3/4/2017	17:15	145.20	7.91	0.448	11.10	1.69	-162	10.1
WI-CV-MW07-S	3/4/2017	13:25	127.80	7.38	0.625	11.40	2.42	162	13.3
WI-CV-MW08-M	3/4/2017	12:00	123.20	7.90	0.555	9.05	2.69	75	
WI-CV-MW08-S	3/2/2017	10:50	117.85	7.24	0.514	8.31	6.11	181	
WI-CV-MW09-M	2/23/2017	16:55	126.91	7.57	0.431	11.85	2.82	-152	17.4
WI-CV-MW10-D	2/20/2017	11:45	140.30	7.14	0.507	10.57	8.48	-40.1	1.63
WI-CV-MW10-M	2/22/2017	10:00	136.20	7.49	0.518	10.15	7.51	215.9	1.52
WI-CV-MW11-M	2/26/2017	14:35	136.15	7.86	0.686	8.02	3.94	57	43.0
WI-CV-MW11-S	2/26/2017	14:30	132.80	7.79	0.435	7.21	13.67	133	3.3
WI-CV-MW12-D	3/1/2017	16:50	160.95	6.90	0.569	10.73	1.48	-128	11.3
WI-CV-MW13-M	2/22/2017	16:25	127.65	7.81	0.462	12.07	6.33	-71	1.7
WI-CV-MW13-S	3/3/2017	17:05	110.82	5.71	0.747	12.40	10.54	127	39.7
WI-CV-MW14-M	3/4/2017	17:00	122.50	7.56	0.599	8.23	1.30	-108	

Notes:

--- turbidity measurements not presented due to inaccurate calibration

°C = degrees centigrade

mg/L = milligrams per liter

mS/cm = milliseimens per centimeter

mV = millivolts

NM = not measured

NTU = nephelometric turbidity units

Groundwater Elevations (March 3 and 18, 2017) Evaluation of Per- and Polyfluoroalkyl Substances in Groundwater Outlying Landing Field Coupeville, Naval Air Station Whidbey Island Coupeville, Washington

				Groundwater	Groundwater
Monitoring	Top of Casing	Depth to Water	Depth to Water	Elevation	Elevation
Well ID	Elevation	(03/03/2017)	(03/18/2017)	(03/03/2017)	(03/18/2017)
	ft msl	btoc	btoc	ft msl	ft msl
WI-CV-MW01-D	194.58	141.83	141.45	52.75	53.13
WI-CV- MW01-M	194.61	123.94	124.31	70.67	70.30
WI-CV-MW02-M	193.11	123.26	123.66	69.85	69.45
WI-CV-MW02-S	193.17	92.19	92.52	100.98	100.65
WI-CV-MW03-D	193.07	143.12	142.94	49.95	50.13
WI-CV-MW03-M	193.14	123.24	123.54	69.90	69.60
WI-CV-MW04-M	193.19	123.13	123.64	70.06	69.55
WI-CV-MW04-S	193.20	106.28	106.73	86.92	86.47
WI-CV-MW05-M	190.64	123.17	123.58	67.47	67.06
WI-CV-MW05-S	190.38	120.49	120.69	69.89	69.69
WI-CV-MW06-M	197.87	NM	146.61	NA	51.26
WI-CV-MW06-S	197.97	138.88	134.97	59.09	63.00
WI-CV-MW07-M	199.57	130.07	129.25	69.50	70.32
WI-CV-MW07-S	200.02	126.53	126.69	73.49	73.33
WI-CV-MW08-M	205.21	121.8	121.98	83.41	83.23
WI-CV-MW08-S	205.17	117.48	117.88	87.69	87.29
WI-CV-MW09-M ²	187.23	161.8	126.21	25.43	61.02
WI-CV-MW09-S ¹	187.15	109.18	109.25	77.97	77.90
WI-CV-MW10-D ²	188.25	149.52	141.35	38.73	46.90
WI-CV-MW10-M	188.33	136.03	136.29	52.30	52.04
WI-CV-MW11-M	202.14	132.79	131.89	69.35	70.25
WI-CV-MW11-S	202.01	131.2	131.30	70.81	70.71
WI-CV-MW12-D	186.85	160.47	160.56	26.38	26.29
WI-CV-MW12-S	186.97	106.4	106.51	80.57	80.46
WI-CV-MW13-M	189.11	127.13	127.54	61.98	61.57
WI-CV-MW13-S	189.28	113.25	110.37	76.03	78.91
WI-CV-MW14-M	191.61	122.35	122.93	69.26	68.68

Notes:

¹-Water column measured to be less than one foot. Groundwater data not used for site investigation.

² Water levels between gauging events were considerably different. For the purpose of cross-sections and contour maps, the water level most consistent with other data from sampling and surrounding wells was used. Future events should confirm levels in these wells.

Dry - well was observed to be dry

btoc = below top of casing

ft = feet

msl = mean sea level

NA = not applicable

NM = not measured

Groundwater Sample Results for PFAS (February and March 2017) Evaluation of Per- and Polyfluoroalkyl Substances in Groundwater Outlying Landing Field Coupeville, Naval Air Station Whidbey Island Coupeville, Washington

Sample ID	USEPA LHA	USEPA RSL	WI-CV-MW01-D-0217	WI-CV-MW01-M-0217	WI-CV-MW02-M-0317	WI-CV-MW02-S-0317	WI-CV-MW02-SP-0317	WI-CV-MW03-D-0217	WI-CV-MW03-M-0217
Sample Date	(May 2016)	(May 2017)	2/28/17	2/28/17	3/1/17	3/1/17	3/1/17	2/27/17	2/27/17
Chemical Name									
Perfluorobutanesulfonic acid (PFBS)		400,000	4 U	3.94 U	3.88 U	332	357	3.91 U	3.88 U
Perfluorooctane Sulfonate (PFOS)	70		0.9 U	0.886 U	0.872 U	54.7	53	0.914 J	0.872 U
Perfluorooctanoic acid (PFOA)	70		2 U	1.97 U	1.94 U	571	564	1.95 U	1.94 U

Notes:

Bolded text indicates detection.

Shading indicates exceedance of USEPA Lifetime Health Advisory.

Underlined text indicates exceedance of USEPA Tapwater RSL, HQ = 1.0.

"P" in the sample ID indicates that a duplicate was collected at this location.

-- = no screening criteria available

LHA = lifetime health advisory

ng/L = nanograms per liter

NS = not sampled

OLF = Outlying Landing Field

PFBS = perfluorobutanesulfonic acid

PFOA = perfluorooctanoic acid

PFOS = perfluorooctane sulfonate

Groundwater Sample Results for PFAS (February and March 2017) Evaluation of Per- and Polyfluoroalkyl Substances in Groundwater Outlying Landing Field Coupeville, Naval Air Station Whidbey Island Coupeville, Washington

Sample ID	USEPA LHA	USEPA RSL	WI-CV-MW04-M-0217	WI-CV-MW04-S-0317	WI-CV-MW04-SP-0317	WI-CV-MW05-M-0217	WI-CV-MW05-S-0217	WI-CV-MW06-M-0217	WI-CV-MW06-S-0217	WI-CV-MW06-SP-0217	
Sample Date	(May 2016)	(May 2017)	2/28/17	3/1/17	3/1/17	2/23/17	2/24/17	2/21/17	2/22/17	2/22/17	
Chemical Name											
Perfluorobutanesulfonic acid (PFBS)		400,000	4.03 U	3.91 U	3.82 U	473	12.9	3.91 U	3.97 U	3.94 U	
Perfluorooctane Sulfonate (PFOS)	70		0.907 U	0.879 U	0.859 U	3.26 J	0.922 U	0.879 U	0.893 U	0.886 U	
Perfluorooctanoic acid (PFOA)	70		2.02 U	1.95 U	1.91 U	1,190	9.87	1.95 U	1.98 U	1.97 U	

Notes:

Bolded text indicates detection.

Shading indicates exceedance of USEPA Lifetime Health Advisory.

Underlined text indicates exceedance of USEPA Tapwater RSL, HQ = 1.0.

"P" in the sample ID indicates that a duplicate was collected at this location.

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OLF = Outlying Landing Field

PFBS = perfluorobutanesulfonic acid

PFOA = perfluorooctanoic acid

PFOS = perfluorooctane sulfonate

Groundwater Sample Results for PFAS (February and March 2017) Evaluation of Per- and Polyfluoroalkyl Substances in Groundwater Outlying Landing Field Coupeville, Naval Air Station Whidbey Island Coupeville, Washington

Sample ID	USEPA LHA	USEPA RSL	WI-CV-MW07-M-0317	WI-CV-MW07-S-0317	WI-CV-MW08-M-0317	WI-CV-MW08-S-0317	WI-CV-MW09-M-0217	WI-CV-MW10-D-0217	WI-CV-MW10-M-0217	WI-CV-MW11-M-0217	
Sample Date	(May 2016)	(May 2017)	3/4/17	3/4/17	3/4/17	3/2/17	2/23/17	2/20/17	2/22/17	2/26/17	
Chemical Name											
Perfluorobutanesulfonic acid (PFBS)		400,000	3.91 U	4.39 U	3.91 U	3.85 U	11.2	3.85 U	3.07 J	7.66 U	
Perfluorooctane Sulfonate (PFOS)	70		0.844 J	0.987 U	0.879 U	0.865 U	0.915 U	0.865 U	0.938 U	1.72 U	
Perfluorooctanoic acid (PFOA)	70		1.95 U	2.19 U	1.95 U	1.92 U	2.03 U	1.92 U	2.08 U	3.83 U	

Notes:

Bolded text indicates detection.

Shading indicates exceedance of USEPA Lifetime Health Advisory.

Underlined text indicates exceedance of USEPA Tapwater RSL, HQ = 1.0.

"P" in the sample ID indicates that a duplicate was collected at this location.

-- = no screening criteria available

LHA = lifetime health advisory

ng/L = nanograms per liter

NS = not sampled

OLF = Outlying Landing Field

PFBS = perfluorobutanesulfonic acid

PFOA = perfluorooctanoic acid

PFOS = perfluorooctane sulfonate

Groundwater Sample Results for PFAS (February and March 2017) Evaluation of Per- and Polyfluoroalkyl Substances in Groundwater Outlying Landing Field Coupeville, Naval Air Station Whidbey Island Coupeville, Washington

Sample ID	USEPA LHA	USEPA RSL	WI-CV-MW11-S-0217	WI-CV-MW12-D-0317	WI-CV-MW13-M-0217	WI-CV-MW13-S-0317	WI-CV-MW14-M-0317	
Sample Date	(May 2016)	(May 2017)	2/26/17	3/1/17	2/22/17	3/3/17	3/4/17	
Chemical Name								
Perfluorobutanesulfonic acid (PFBS)		400,000	3.91 U	3.97 U	139	4.07 U	111	
Perfluorooctane Sulfonate (PFOS)	70		1 U	0.893 U	0.872 U	0.915 U	0.898 J	
Perfluorooctanoic acid (PFOA)	70		1.95 U	1.98 U	20.4	2.03 U	166	

Notes:

Bolded text indicates detection.

Shading indicates exceedance of USEPA Lifetime Health Advisory.

Underlined text indicates exceedance of USEPA Tapwater RSL, HQ = 1.0.

"P" in the sample ID indicates that a duplicate was collected at this location.

-- = no screening criteria available

LHA = lifetime health advisory

ng/L = nanograms per liter

NS = not sampled

OLF = Outlying Landing Field

PFBS = perfluorobutanesulfonic acid

PFOA = perfluorooctanoic acid

PFOS = perfluorooctane sulfonate

Figures





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Legend

- Well Location
- ▲ Keystone Hill Well Location -

Well Depths

- ▲ < 60 ft bgs △ 151 200 ft bgs ▲ >201 ft bgs
- Cross Section A-A'
- Cross Section B-B'
- Cross Section C-C'
- Cross Section D-D'
- Base Boundary



1 inch = 0.2 mile Imagery Source: Esri

Figure 3 Cross Section Locations Outlying Landing Field Coupeville Naval Air Station Whidbey Island Coupeville, Washington

For Official Use Only





*Water level anomalous data estimated from March 18, 2017 round.

Cross section is vertically exaggerated for visualization purposes.

Cross section is conceptual in nature; predominant soil type was generally used for stratigraphic interpretation, however, in some cases similar units were combined for the purpose of simplification.

Geologic contacts are dashed where inferred.



Figure 4 Cross Section A-A' Outlying Landing Field Coupeville

Naval Air Station Whidbey Island Coupeville, Washington





NG0412170816VBO NAS_Whidbey_Cross_Section_B-B'_v5.ai kw







NG0412170816VBO NAS_Whidbey_Cross_Section_D-D'_v11.ai kw

R:\N\Navy\CLEAN\MULTI_REGION\PFC_679580\MapFiles\NW\Whidbey_NAS\Coupeville_Reporting\Figure Zone GW Contour Map.mxd7/26/2017bmailhe 8 Middle MW11M 70.25 MW08M 83.23 MW07M 70.32 MW04M 69.55 MW14M 68.68 MW01M 70.30 MW03M 69.60 MW02M 69.45 MW05M 67.06 MW13M 61.57 MW06M 51.26 MW09M 61.02 MW10M 52.04



Legend

- Monitoring Well Location
- 5-foot Contour Interval (dashed where inferred)
 Direction of Middle Groundwater Flow
- Base Boundary



1 inch = 0.2 mile

Imagery Source: Esri

Figure 8 Middle Zone Groundwater Contours Outlying Landing Field Coupeville Naval Air Station Whidbey Island Coupeville, Washington

For Official Use Only

Note:

Groundwater level measurements used to generate this contour map were collected 3/3/2017 and 3/18/2017.

R:\N\Navy\CLEAN\MULTI_REGION\PFC_679580\MapFiles\NW\Whidbe 5/2017bmail



Legend

- Monitoring Well Location
- 5-foot Contour Interval (dashed where inferred)
 Direction of Deep Zone Groundwater Flow
 Base Boundary

0.2 0.1 Miles

1 inch = 0.2 mile

Imagery Source: Esri

Figure 9 Deep Zone Groundwater Contour Map Outlying Landing Field Coupeville Coupeville, Washington

For Official Use Only

Note: Groundwater level measurements used to generate this contour map were collected 3/3/2017 and 3/18/2017.

CV-MW11-M	2/26/17	And the second second	CV-MW11-S	2/26/17				CV-MW08-S	3/2/17	CV-MW08-M	3/4/17
Depth (ft bgs)	170.43		Depth (ft bgs)	140.43			and the states	Depth (ft bgs)	131.26	Depth (ft bgs)	165.21
PFBS	7.66 U		PFBS	3.91 U			a series and a	PFBS	3.85 U	PFBS	3.91 U
PFOS	1.72 U	·······	PFOS	1.0 J	-	N.		PFOS	0.865 U	PFOS	0.879 U
PFOA	3.83 U		PFOA	1.95 U		V		PFOA	1.92 U	PFOA	1.95 U
CV-MW07-S	3/4/17		and the second			-1		State of the second			
Depth (ft bgs)	145.02		States and				COLUMN STREET, ST			10 million	
PFBS	4.39 U					7.0				CV-MW01-M	2/28/17
PFOS	0.987 U		Nº YA			Building 11	9/19/16	100 m		Depth (ft bgs)	163.36
	2.19.0					Depth (ft bgs)	162			PFBS	3.94 U
CV-MW07-M	3/4/17					PFBS	10 U	Si Caracia		/ PFOS	0.886 U
Depth (ft bgs)	193.75					PFOS	10 U		/ /	PFOA	1.97 U
PFBS	3.91 U			8		PFOA	30	and the second s	/ /	CV-MW01-D	2/28/17
PFOS	0.844 J			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			1745 M		/ /	Depth (ft bgs)	217.42
TIOA	1.95 0						Parten a		/ /	PFBS	4 U
CV-MW04-M	2/28/17						ist and		11	PFOS	0.9 U
Depth (ft bas)	159.05			and the second			the training		1 10	/ PFOA	2 U
PFBS	4.03 U			1			- A A A A A		- A1	350	皆问题
PFOS	0.907 U									CV-MW02-S	3/1/17
PFOA	2.02 U		1 and	Í.					1 1	Depth (ft bgs)	106.86
	0/1/17	1 Ling	X						P	PFBS	332 D
Depth (ft bas)	3/1/1/		in the second		-	·				PF05	54. <i>1</i>
PFBS	3.91 U	and the second	- Market				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
PFOS	0.879 U							• • • • /		NO.	
PFOA	1.95 U	1					1		/ /	CV-MW02-M	3/1/17
CV-MW14-M	3/4/17		A A					/	/ /*	Depth (ft bgs)	167.96
Depth (ft bgs)	176.34	Sand Martin					1		/ /	PFBS	3.88 U
PFBS	111		A CALAR		Part 1	*		///	/	PFOS	1.872 U
PFOS	0.898 J		后。何望 公 [13]	E P					1 22	ITOK	1.54 0
PFOA	166			Address of the second	1000			//	1	CV-MW05-S	2/24/17
CV-MW03-D	2/27/17							1/ /		Depth (ft bas)	124.56
Depth (ft bgs)	237.43		Contraction of the second	The self				11 1		PFBS	12.9
PFBS	3.91 U					1×1 K			1.0.35	PFOS	0.922 U
PFOS	0.914 J		1 141 ····	19110194		Build	ing 11		1. august 199	PFOA	9.87
PFOA	1.95 U	AS LEAD T	and the second	Ta the second se						CV-MW05-M	2/23/17
CV-MW03-M	2/27/17		-	R' L'auge I		111				Depth (ft bgs)	175.35
Depth (ft bgs)	160.35	10-10 - 10 - 10	Martine 194 1			10		1/ /	S 12 - 24	PFBS	473
PFBS	3.88 U	TRANSPORT	E. Car			DATE:	CNAMI 01		18 22	PFOS	3.26 J
PFOS	0.872 U					WI-			and the second	PFUA	1190
PFOA	1.94 U			and the second			111		and the state of the second		0/00/17
CV-MW13-S	3/3/17	100 -	16 T				/	10 000		Depth (ft bos)	2/22/17
Depth (ft bgs)	114.98	A well a law	2 - 700			e e e e e e e e e e e e e e e e e e e				PFBS	3.97 U
PFBS	4.07 U	/ stime					111	11	TTOTA	PFOS	0.893 U
PFOS	0.915 U	the man	Se al Contractor	and the second						PFOA	1.98 U
	2.03 0		A.S.O. 1531	23672			and a strength		Tem First		1
CV-MW13-M	2/22/17	and the second		and and the second		Building	2807			CV-MW06-M	2/21/17
Depth (ft bas)	187.76	and the second		and and	Tarren					Depth (ft bas)	189.51
PFBS	139	- Contraction					2		E CARLES	PFBS	3.91 U
PFOS	0.872 U	1 C . 1 .	and relia	1						PFOS	0.879 U
PFOA	20.4			1		M. Star	1		ALL PROPERTY	PFOA	1.95 U
CV-MW09-M	2/23/17		State -							and the	
Depth (ft bas)	197.33	and the state of t	and states	/	00 1000					CV-MW10-D	2/20/17
PFBS	11.2			25			ALC AL		and the second	Depth (ft bgs)	206.67
PFOS	0.915 U				/t			9		PFBS	3.85 U
PFOA	2.03 U		- Frank		1 44		A CARE		No.	PFOS PFOA	U.865 U
		A WAY AND COM	2 march	A BARA							1.32 U
CV-MW09-S	NA	The A	Building	2807 9/19/1	6	A REAL PROPERTY				CV-MW10-S	2/22/17
Deptn (π bgs)	110.92 NS	12010	Depth (ft b	ogs) 178	5	A Trans	Al California			Depth (ft bgs)	159.45
PEOS	NS	- 1º20 -	PEOS	110	56	Bar .			li li	PFBS	3.07 J
PFOA	NS	Cart Con	PFOA	17.5	J	States -				PFOS	0.938 U
A LOS A	a States &		· · · · · ·		The Instance					PFOA	2.08 U
and the second division of the second divisio				and the second					, All and All	CV-MW12-9	NΔ
Notes					A AL					Depth (ft bas)	106.92

R:NNavy/CLEAN/MULTI REGION/PFC 679580/MapFiles/NW/Whidbey NAS/Coupeville Reporting/Figure 10 Detections PFAS GW.mxd5/25/2017bmailhes CV-MW11-S

PFBS - Perfluorobutanesulfonic acid PFOS - Perfluorooctane Sulfonate PFOA - Perfluorooctanoic acid

LHA - lifetime health advisory units - nanograms per liter (ng/L) ft bgs - feet below ground surface NS - not sampled J - analyte detected, concentration is estimated U - not detected D - diluted sample Bold indicates detection Shaded text indicates exceedance of USEPA LHA

Samples were not collected from CV-GW09S and CV-GW12S because the wells were dry at the time of sampling. Samples collected from the wells within Buildings 2807 and 11 were analyzed by ALS-Kelso using Method 537 for drinking water.

Legend

- Base Supply Well
- ightarrowMonitoring well with no exceedance of LHA
- Monitoring well with LHA exceedance ightarrow
- No detections of PFAS
- Not Sampled
- → Direction of Middle Zone Groundwater Flow
- Direction of Deep Zone Groundwater Flow
- Base Boundary





1 inch = 0.2 mile Imagery Source: Esri

Figure 10 Detections of PFAS in Groundwater Outlying Landing Field Coupeville Coupeville, Washington

PFBS

PFOS

For Official Use Only

NS

NS

R:\N\Navy\CLEAN\MULTI_REGION\PFC 80\MapFiles\NW\Whidbey NAS\Coupeville ations





Legend

- Proposed Monitoring Well Location
- Base Supply Well
- Monitoring well with no exceedance of LHA
 Monitoring well with LHA exceedance
- No detections of PFAS
- Not Sampled
- Base Boundary
- -> Direction of Middle Zone Groundwater Flow
- → Direction of Deep Zone Groundwater Flow

0.15 0.3 0 Miles

1 inch = 0.3 mile Imagery Source: Esri Figure 11 Proposed Monitoring Well Locations Outlying Landing Field Coupeville Coupeville, Washington

For Official Use Only

Attachment 1 Soil Boring Logs



BORING NUMBER: WI-CV-MW01-D

SHEET 1 OF 8

SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439605.0 N, 1202430.7 E)

ELEVATION: 194.6 ft

DRILLING	METHOD	AND EQUI	PMENT :	Sonic Drilling

WATER	LEVELS	:		START : 11/30/16 14:40 E	ND					LOGG	ER : R. Clennon
DEPTH E	BELOW SI	JRFACE (I	FT)	SOIL DESCRIPTION		DG	R	PID EADING	SS		
	INTERVA	L (FT) RECOVE	RY (FT) SAMPLE #/TYPE	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMBOLIC LC	Breathing Zone	Headspace	Above Hole	COMMENTS	WELL DIAGRAM
194.6_ _ _ _ _				Hand auger, move truck to clear utilities 0.0-5.0'							
5 189.6_	5.0	1.3	SN-1	Poorly Graded Sand with Gravel (SP)	_		0.0		0.0		
	16.0	8.0	SN-2	 5.0-6.0' - very dark grayish brown (10YR 3/2), brown, moist, loose, medium to coarse-grained sand, small to large subround to subangular gravel, little silt, cobbles to 0.16' length Sand and Gravel (SP/GP) 6.0-7.0' - very dark grayish brown (10YR 3/2), saturated, loose Poorly Graded Sand with Gravel (SP) 7.0-8.5' - grayish brown (10YR 3/2), wet, loose, fine to medium-grained sand, some silt Poorly Graded Sand with Gravel (SP) 8.5-10.3' - dark gray (10YR 4/1) to dark grayish brown (10YR 4/2), moist, fine to medium sand, some silt Poorly Graded Sand with Silt (SP-SM) 10.3-12.2' - dark gray (10YR 4/1), moist, loose, fine to medium sand, little gravel, cobbles to 0.4' Poorly Graded Sand with Silt (SP-SM) 12.2-14.0' - gray (10YR 5/1) to dark gray (10YR 4/1), moist, loose, little angular to subangular gravel, cobbles and rock fragments to 0.6' No Recovery 			0.0	0.0 0.0 0.0 0.0	0.0		
- - - - - - - - - - - - - - - - - - -	26.0	9.0	SN-3	(Slough?) Poorly Sorted Sand with Gravel 16.0-17.6' - dark grayish brown (10YR 4/2), wet, loose, little silf fine to medium-grained sand, subrounded to subangular grave Poorly Graded Sand with Gravel (SP) 17.6-25.0' - dark gray (10YR 4/1), moist, loose, fine to medium-grained sand, subround to round gravel (fine to large) little silt No Recovery 25.0-26.0' Poorly Graded Sand with Gravel (SP) 26.0'-27.2 - Same as above Poorly Graded Sand with Gravel (SP) 27.2-32.6' - grav (10YR 5/1) with gravish brown (10YR 5/2)			0.0	NR 0.0 0.0 0.0	0.0		
- - - - - - -				moist to damp, loose, subround to round gravel, fine to mediun sand	- 1 -						



BORING NUMBER: WI-CV-MW01-D

SHEET 2 OF 8

SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439605.0 N, 1202430.7 E)

ELEVATION: 194.6 ft

DRILLING CONTRACTOR : Cascade Drilling

DRILLING METHOD AND EQUIPMENT : Sonic Drillin	DRILLING M	/IETHOD AND	EQUIPMENT :	Sonic	Drilling
---	------------	-------------	-------------	-------	----------

WATER LEVELS : ---START : 11/30/16 14:40 END LOGGER : R. Clennon DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing Headsp CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 164.6 Stop drilling for 0.0 day (11/30/16) at SN-4 8.1 0.0 0.0 26' bgs Resume drilling 12/1/16 at 0915 Used Poorly Graded Sand with Silt (SP-SM) 0.2 approximately 325 gallons 32.6-34.1' - brown (10YR 4/3), moist, loose, fine-grained sand, trace fine gravel water 11/30/16, No Recovery 35 1 bag quik gel 34.1-36.0' 159.6 36.0 0.2 Poorly Graded Sand with Silt (SP-SM) 36.0-39.9' - gray (10YR 5/1) to dark grayish brown (10YR 5/2), moist, loose, fine to medium-grained sand, trace fine gravel 0.0 40 154.6 Silty Sand (SM) 0.1 39.9-47.2' - dark gray (10YR 4/1) to dark grayish brown (10YR 4/2), moist, loose, fine-grained sand, few fine to large gravel (subround to subangular) 0.1 0.1 45 149.6 14.3 SN-5 0.0 0.1 0.0 Note: Quick-gel added to drilling water to drive Silty Sand (SM) outter casing 47.2-50.3' - same as above, trace gravel 0 1 50 144.6 0.1 No Recovery 50.3-56.0' 55 139.6 56.0 Silty Sand (SM) 56.0-60.4' - dark gray (10YR 4/1), moist, loose to moderate dense, fine-grained sand, some silt, trace gravel 60



BORING NUMBER: WI-CV-MW01-D

SHEET 3 OF 8

SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439605.0 N, 1202430.7 E)

ELEVATION: 194.6 ft

DRILLING CONTRACTOR : Cascade Drilling

DRILLING METHOD AND EQUIPMENT : Sonic Drilling

WATER	LEVELS	:		START : 11/30/16 14:40 E	ND :					LOGG	ER : R. Clennon
DEPTH E	BELOW SI	JRFACE (FT)	SOIL DESCRIPTION		<i>(</i> 1)	R		29		
	INTERVA	L (FT)		SOIL NAME, USCS GROUP SYMBOL, COLOR		IC LOG	Zone			COMMENTS	WELL DIAGRAM
		RECOVE	SAMPLE	MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMBOL	Sreathing 2	Headspace	Above Hole		
134.6			#/TYPE					_	4		
				Silty Sand (SM) 60.4-66.0' - same as above, gray (10YR 5/1)				0.2			
65_ 129.6_ _		16.5	SN-6	Silfy Sand (SM)	-		0.0	0.2	0.0		
				66.0-72.6' - dark gray (10YR 4/1) to dark grayish brown (10YR 4/2), moist, moderate dense to dense, fine-grained sand, trace dense silt stringers, dark gray (10YR 4/1)			0.0	0.2	0.0		
70 124.6_ 								0.1			
- - - 75				No Recovery 72.6-76.0'				0.1			
119.6								NR			
	76.0			Poorly Graded Sand with Silt (SP-SM) 76.0-80.4' - dark grayish brown (10YR 4/2), moist, loose to medium dense, fine-grained sand				0.1			
114.0 - 				Poorly Graded Sand with Silt (SP-SM) 80.4-86.0' - same as above with trace gray (10YR 5/1), silt stringers				0.1			
85_ 109.6_ - - - -		14.6	SN-7	Poorly Graded Sand with Silt (SP-SM) 86.0-90.5' - same as above, wet in 89.0-90.5' silt lens, approximately 0.5' thick, grayish brown (10YR 5/2) to brown (10YR 5/3), moist, stiff, low plasticity, little fine-grained sand, moderate cohesiveness			0.0	0.1	0.0		
90					_						
						<u>. 11 î</u>					YA LYA



BORING NUMBER:

WI-CV-MW01-D SHEET 4 OF 8

SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439605.0 N, 1202430.7 E)

ELEVATION: 194.6 ft

DRILLING METHOD AND EQUIPMENT : Sonic Drilling	

WATER	LEVELS	:		START : 11/30/16 14:40	END					LOGO	ER : R. Clennon	
DEPTH E	BELOW S	JRFACE (FT)	SOIL DESCRIPTION				PID	~~			
1			. ,			00	READING		GS			
	INTERVA	AL (FI)				one C		2				
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		Ē	g Zd	ace	e	COMMENTS	WELL DIAGRAM	
				CONSISTENCY SOIL STRUCTURE MINERALOGY		ABC	athin	dspi	θĒ			
			SAMPLE			S,	Bre	Hea	Abo			
104.6			#/ITFE					0.1	_			
104.0				No Recovery		1.1 1						
-				90 5-96 0'	-						- 24	
_					-							
					_							
					_							
_					_							
_					_						X X -	
05 -					_						- 18	
90								NR				
55.0 _	96.0				-						\bowtie	
-	00.0			Poorly Graded Sand with Silt (SP-SM)						Driller Note: In		
_				96.0-98.7' - very dark gravish brown (10YR 3/2), moist,	_	미귀				96-116 sample,		
				moderate density, fine-grained sand, some silt	_	티라				clayey material	\otimes \otimes \Box	
_					_	66				squeezed/extrude		
-					_	由計		0.0		when retrieving	Bontonito -	
_				Silty Sand (SM)	-					core sample, to	Grout	
100 -				98.7-102.0' - very dark grayish brown (10YR 3/2), moist,	-					length of core		
94.6				moderate dense to dense, fine-grained sand						iong in or core		
					-							
-					_							
_				Poorly Graded Sand with Silt (SP-SM)	_	말할						
_				102.0-104.0' -same as 96.0-98.7	_	답답						
_					-	同時					₩₩ -	
_											- 🕅 🕅	
105				Clay (CL) 104 0-110 0' - dark gray (10YR 4/1) and yery dark gray	-						K K -	
89.6				(GLEY1.3) stiff to very stiff medium plasticity little fine sand				0.1				
		~~~~		clav is extruded/stretched beyond actual thickness	-							
-		23.6	SN-8		_		0.0		0.0		$\bigotimes$	
_					_							
_					_						- 12	
_					-						KI KI -	
-					-			0.1			N N -	
110 -					-							
84.6				Silt (ML)		r í í í í				12/1/16	$\otimes \otimes$ -	
				110.0-113.0' - dark gray (10YR 3/1) to very dark gravish brow	vn –					Approximately 2		
				(10YR 3/2), moist, very stiff	_					? water (600		
					_					gallons) used in		
_					_					drilling; 4 bags		
-				Cite (ML)		+++				quik gel used	N N -	
-				SIII (ML) 112.0.116.0' dark grow (10VP 4/1) to dark growish brown	-						X X -	
-				(10YR 4/2) moist medium stiff/dense little fine sand	-						- 18	
115					-						$\bowtie$	
79.6								0.0				
_	116.0					Ш						
				Silt with Sand (ML)	_							
				116.0-124.0' - dark gray (10YR 4/1), moist, very stiff/dense,	_							
_				tine-grained sand, no to low plasticity	_						M M -	
-					-						- 12	
-					-						$\bowtie$	
-					_			0.1				
120					-							



BORING NUMBER:

WI-CV-MW01-D SHEET 5 OF 8

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439605.0 N, 1202430.7 E)

ELEVATION: 194.6 ft

DRILLING METHOD AND EQUIPMENT : Sonic Drilling

WATER	LEVELS	:		START : 11/30/16 14:40	END					LOGG	ER : R. Clennon	
DEPTH BELOW SURFACE (FT)		FT)	SOIL DESCRIPTION			R	PID					
	INTERVA	RVAL (FT)				DOLOG	e e		30	-		
		RECOVE	SAMPLE	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMBOLIC	Breathing Zo	Headspace	Above Hole	COMMENTS	WELL DIAGRAM	
74.6			#/ITPE						<u>`</u>			
				Silé with Sand (ML)				0.1				
125_ 69.6 _ - - - - -		22.2	SN-9	(GLEY1 3), moist, very stiff/dense, fine-grained sand, non-plastic			0.0	0.2	0.0			
130 64.6 _ - - - - -								0.2		Completed drilling for day on 12/1/16; reached 116' bgs, 96- 116; sample pulled Friday (12/2)		
135 59.6	136.0			Silt with Sand (ML) 135.0-136.0' - same as above, grayish brown (2.5Y 5/2) to da	 ark			0.2		10/0/10: Due te		
-				Grayish brown (2.5Y 4/2) Silt with Sand (ML) 136.0-137.8' - same as above, wet t saturated (from drilling fluids) Poorly Graded Sand (SP) 137.8-148.6' - dark gray (2.5Y 4/1) to dark grayish brown	= = =		•			nuclear for the second		
140 54.6 _ _ _ _ _ _				(10YR 4/2), moist (unsaturated), loose, tine to medium-graine sand, trace fine to loose subround to subangular gravel	- 00  - - - - -					unsaturated to current depth of 136' bgs Drill to 136' bgs on 12/2/16, 150 gallons water used Driller Note: (136-156' (3ample) used		
145 49.6  		12.6	SN-10	No Recovery	-  - - - - - - -		· · · · · · · · · · · · · · · · · · ·		0.0	auger tip to better retain sample (sand), hit something hard at bottom of core, but sample (sand) lost recovery out of bottom of core		
150				148.6-156.0'	_							



BORING NUMBER: WI-CV-MW01-D

SHEET 6 OF 8

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439605.0 N, 1202430.7 E)

ELEVATION: 194.6 ft

DIGEENTO METHOD / ND EQUI MENT : Como Diming
----------------------------------------------

WATER	LEVELS	:		START : 11/30/16 14:40	END	:				LOGO	ER : R. Clennon	
DEPTH BELOW SURFACE (FT)		FT)	SOIL DESCRIPTION		(1)		PID	20				
						Ö	READING		50	4		
	INTERVA	L (FI)				U U	C L Sne			001/0/51/70		
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		5	ig Zo	ace	ole	COMMENTS	WELL DIAGRAM	
				CONSISTENCY SOIL STRUCTURE MINERALOGY		ΜB	athir	dsbe	Ve H			
			SAMPLE #/TYPE			SΥΙ	Bre	Hei	Abo			
44.6			#/III L									
					-							
_					_							
											$\bigotimes$	
					_							
_					_							
_					_			0.0			- 🛛 🖓	
_					-						K K -	
155					-						$\otimes$ $\otimes$ -	
39.6						1						
_	156.0				-							
				Poorly Graded Sand (SP)	_					156-176'		
_				156.0-156.9' - same as above, moist to wet (unsaturated)						Sample: Using		
_				Poorly Graded Sand (SP)	_					auger tip, driller	- 🛛 🖓	
_				156.9-158.0' - transitioning to silt, very dark gray (GLEY1 3/	N),			0.0		feels 1/5	KI KI -	
_				\moist, very stiff, no to low plasticity	/-			0.0		to 164' wash out	N N -	
-				Silt (ML)	-					sand above it in		
160				158.0-161.3 - same as above	-					hole, use regular	$\otimes$ $\otimes$ -	
34.6		4.9	SN-11				0.0		0.0	bit/tip to confirm		
										presence of till or		
				No Bocovory	_					continuing layer		
_				161 3-164 0'	_							
_				101.0-104.0	_						N N -	
-					-			0.0			X X -	
-	164.0				-			0.0			⋈ ⋈ -	
_	104.0			No Recovery	-							
165				164.0-167.0'	_							
29.6		0.0	SNI 12			1						
		0.0	SIN-12		_		0.0		0.0			
_					_						N N -	
_	167.0							0.0			X X -	
-				SIIT (INIL) 167.0.160.8', same as above (156.0.161.3')	-			0.0			- 18	
-				107.0-109.0 - Same as above (150.5-101.5)	-							
_					-							
					_							
170				Silty Sand (SM)								
24.6				169 8-171 8' - very dark brown (GLEY1 3/N) moist loose to	_			0.0			N N -	
_				moderate dense, subround to round fine to large gravel,	_						X X -	
_		11.0	SN-13	cobbles to 0.3' length	_		0.0		0.0		- 18	
_				Silty Sand (SM)	-			0.0				
_				171.8-173.6' - very dark gray (10YR 3/1) to very dark gray	-						$\bigotimes$	
				(GLEY1 3/N), damp, very stiff to hard, low plasticity	_							
_				Gravelly Silt with Sand (ML/CL)	_							
475 -				$\uparrow$ 173.6-174.2' - very dark gray (10YR 3/1), moist, loose to	/-						- 12 12	
1/5				\moderate dense/stiff, fine-grained sand, fine to large angular	⁺to /							
19.0	176.0			subround gravel, non-uniform	/ -							
-	170.0			Slit with Sand (ML)	<u>ا</u> ا					In 176-196'		
-				3/N) moist very stiff to hard trace fine to subround to	' /-					Material extruded		
				subangular gravel						to > 20'		
				Silt/Lean Clav (ML/CL)								
_				176.0-185.5' - dark gray (GLEY1 3/N) to very dark grav (10Y	′R –						$\bowtie$	
_				3/1), moist, hard, low plasticity, trace coarse sand, in	_						KA KA -	
180				182.5-183.0', Sandy Lean Clay, trace coarse sand	-							
100									-			


BORING NUMBER:

WI-CV-MW01-D SHEET 7 OF 8

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439605.0 N, 1202430.7 E)

ELEVATION: 194.6 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER LEVELS : DEPTH BELOW SURFACE (FT)				START : 11/30/16 14:40	END :		_			LOGG	ER : R. Clennon
DEPTH E	BELOW SU	JRFACE (F	FT)	SOIL DESCRIPTION		Ŋ	RÍ	PID	GS		
	INTERVA	.L (FT)				IC LC	one				WELL DIAGRAM
		RECOVE	RY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY SOIL STRUCTURE MINERALOGY		MBOL	athing 7	adspace	ve Hole		
			SAMPLE #/TYPE			sΥμ	Breć	Hez	Abov		
14.6 _ _ _ _ _											
185 9.6 - -		24.5	SN-14	Lean Clay (CL) 185.5-186.7' - very dark gray (10YR 3/1) to very dark gray (GLEY1 3/N), moist, stiff to medium stiff, low to moderate plasticity Sandy Silt (ML)			0.0	0.1	0.0		
190 4.6				186.7 ⁻ 195.7 ¹ - very dark gray (GLEY1 3/N) to very dark greenish gray (GLEY1 3/1), moist to wet, very stiff to hard, no low plasticity, little clay, poorly graded	to			0.0		Note: Isolation casing driven to 196' bgs, install bentonite seal 189-196' bgs using bentonite pellets	
- 195 -0.4 -	196.0			Silty Sand (SM) 195.7-196.0' - very dark gray (GLEY1 3/N) to very dark				0.0			
200 -5.4				<ul> <li>greenish gray (GLEY1 3/1), moist, moderate dense, fine-grained sand</li> <li>Poorly Graded Silty Sand (SM)</li> <li>196.0-198.4' - very dark gray (GLEY1 3/N), moist to wet, moderate dense, fine-grained sand, little clay</li> <li>Sandy Silt (ML)</li> <li>198.4-199.0' - very dark gray (GLEY1 3/N), wet, trace little subround to round gravel, little clay, non-plastic</li> <li>Lean Clay with Sand (CL)</li> <li>199.0-201.2' - dark gray (GLEY1 4/N) and pale brown (10YR 6/3), moist, very stiff to hard, trace sand and fine to large subround to round gravel</li> </ul>				0.0			- Bentonite Chips - Chips - 20/40 Sand
205 -10.4 -		14.1	SN-15	Sandy Silt (ML) 201.2-203.0' - same as 198.4-199.0' Poorly Graded Gravel with Sand (GP) 203.0-205.6' - very dark gray (GLEY1 4/N), wet, fine to coarse sand, fine to large subround gravel Poorly Graded Gravel with Sand (GP) 205.6-207.6' - very dark gray (GLEY1 3/N), to very dark gray (10YR 3/1), wet, loose, few to little clay, trace fine to coarse round to subround gravel, non-plastic TILL - Poorly Graded Silty Sand (SM)	α 		0.0	0.4	0.0		2" 2" Schedule - 80 - 0.010-
-				207.6-210.1 - Very dark grayish brown (101R 4/2), moist to wet, dense, trace fine subangular to subround gravel	-	i ji					
210						7/6		$\left  - \right $			
1	, I	, I	( I			1	1 '	1 1	I	1	1



BORING NUMBER:

WI-CV-MW01-D SHEET 8 OF 8

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439605.0 N, 1202430.7 E)

ELEVATION: 194.6 ft

DRILLING CONTRACTOR : Cascade Drilling

	DRILLING METHO	D AND EQUI	PMENT : S	onic Drilling
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WATER LEVELS : DEPTH BELOW SURFACE (FT)				START : 11/30/16 14:40 EN	ND :					LOGG	ER : R. Clennon
DEPTH E	BELOW SI	JRFACE (	FT)	SOIL DESCRIPTION		Ċ	R	PID EADING	s		
	INTERVA	L (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		BOLIC LO	ning Zone	space	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMI	Breath	Head	Above		
-15.4 _ 	212.0			<b>No Recovery</b> 210.1-212.0'	-	<del>2.8 213</del>		0.4			
- - 215 -20.4 - - - 220.4 - - - - - - - - - - - - - - - - - - -		18.3	SN-16	Poorly Graded Silty Sand (SM) 212.0-213.5' dark gray (10YR 4/1), moist to wet, dense, trace fine to subround gravel Sandy Silt and Poorly Graded Sand (SM) 213.5-216.2' - dark gray (10YR 4/1), moist, very dense, fine-grained sand, trace fine to large subround to round gravel TILL Material/Silty Sand (SM) 216.2-222.3' - dark grayish brown (10YR 4/2), moist, very dense, trace to little subround gravel (fine to ?), fine-grained to round sand, few clay stringers, non-plastic			0.0	0.0	0.0		
-23.4 	226.0			Silt and clay (CL) 222.3-225.3' - dark gray to dark greenish gray (10YR 4/1 to GLEY 4/1), moist, low to medium plasticity, interbedded with 0.2-0.5' sand lenses, very dark gray (10YR 3/1) - color transition to dark greenish (GLEY1 4/1) in 225.0-226.0'				0.0			- - - - - - - - - - - - - - - - -
   		13.8	SN-17	Silt and clay (CL) 226.0-226.9' - same as above Sandy Silt Interbedded with Clay (ML/CL) 226.9-229.2' - very dark gray (GLEY1 3/N), moist, very stiff Silt and clay (CL) 229.2-230.5' - same as 225.0-226.0' Poorly Graded Silty Sand (SM) 230.5-233.5' - very dark greenish gray (GLEY1 3/1), moist			0.0	0.0	0.0		- - - - - - - - - - - - - - - - - - -
- - - - - - 40.4 - -	236.0			Silt (ML) 233.5-236.0' dark greenish gray (GLEY1 4/1), to greenish gray (GLEY1 5/2), moist, very stiff to hard, little to some fine sand, no to low plasticity				0.0			- - - - - - - - - 
				Bottom of Boning at 230.0 it bys Off							



WI-CV-MW01-M SHEET 1 OF 7

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439611.4 N, 1202426.5 E)

ELEVATION: 194.6 ft

DRILLING CONTRACTOR : Cascade Drilling

WAIEF	<u>R LEVELS</u>	<u>5 : 123.4 i</u>	t bgs	START : 12/9/10 13:10	END	: 12/	12/16	15:3	30	LOGG	ER : R. Clennon
DEPTH	DEPTH BELOW SURFACE (FT)		(FT)	SOIL DESCRIPTION				PID	20		
			. ,			8	R	EADIN	کن		
	INTERV	AL (FT)					one				
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		Ĕ	g Zo	e	e	COMMENTS	WELL DIAGRAM
			、 <i>,</i>	MOISTURE CONTENT, RELATIVE DENSITY OR		B	hing	lspa	Ч		
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		ž	srea	Teac	Noq		
1010			#/TYPE			0)	ш	-	<		
194.6	-			Hand cleared with vac truck, hand auger	-						- 12 12
	-			0.0-5.0	-						- KA
-	-				-						K K -
-	-				-						- 124
	1				-						
-					-						- 12
					_						
-	1				_			NA			
5	5.0										
189.6				Poorly Graded Sand with Gravel (SP)	_						
-				5.0-7.0' - dark brown (10YR 3/3), wet, loose to moderate den	se, _						N N -
				fine to medium ungrained sand, some silt, fine to coarse rour	nd _						- 12
-	-			to to subround grained		•••••					- 12 1
	-			Poorly Graded Sand with Gravel (SP)	-						- 🕅 🕅
	-			7.0-13.2' - dark grayish brown (2.5Y 4/2), moist, loose,	_			0.0			KA KA -
-				medium-grained sand, little coarse sand, trace lew siit, line to	) _			0.0			- 12 12
				coarse subangular to round graver	-						X X -
10					-						- 12
184.6			0114								
-	1	8.2	SIN-1		_	11.14	0.0		0.0		
					_						
-					_	le de					N N -
-					_						
-	-			No Recovery	-						X X -
	-			13.2-16.0'	_			0.0			- 🕅 🕅
15 -					-			0.0			- 12
179 6	-										
170.0	16.0				-						Y Y -
-				Poorly Graded Sand (SP)		1.1					- 14 14
-				16.0-17.2' - dark brown (2.5 4/2), moist, loose, fine to	_						
				$\neg$ medium-grained sand, trace coarse sand and fine subround	to /						
				_∖subangular gravel, trace silt							
-				Poorly Graded Sand (SP)							X X -
-	_			17.2-17.9' - very dark gray (10YR 3/1), moist, moderate dens	se,  _						- 12 12
-	-			fine to medium-grained sad, little silt, trace coarse sand and	-			0.0			XX -
174 0	4			tine-grained							$\bowtie \bowtie -$
1/4.0	1			Poorly Graded Sand with Gravel (SP)	_					Diller Note:	- 🕅 🕅
	1			17.9-23.8 - Oark gray (2.5Y 4/1), dry to moist, loose,	-					20-24' bos and	KA KA -
	1			inte-grained sand, line to coarse round to subround gravel	-					30-33' bas. plus	
-	1				-					a few large	
I -	1				_					cobbles felt -	
						$\mathbb{R}^{1}$				many account for	
	1			Boorly Gradod Sand (SB)				Ι.		loss of recovery	Ki Ki –
	4			23 8-26 0' - dark gravish brown (2 5V 4/2), dark gravish brown	/n —			0.0		ın 36' sample	- 124 12
25	4			moist loose fine-grained little silt							KA KA —
169.6	4				_	ti F					- 12 12
	4	10.0	SN-2	No Bosovory			0.0		0.0		- 12 12
	-			26 0-36 0' - see driller's note	-		0.0		0.0		- 🕅 🕅
	1				-						- 🕅 🕅
	1				-						KA KA -
-	1				_						
I -	1				_						
I -	]										$\bowtie$
30											
1	1										



BORING NUMBER: WI-CV-MW01-M SHEET 2 OF 7

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439611.4 N, 1202426.5 E)

ELEVATION: 194.6 ft

DRILLING CONTRACTOR : Cascade Drilling

	WATER	LEVELS	<u>5 : 123.4 f</u>	t bgs	START : 12/9/10 13:10	END	: 12/	12/16	15:3	30	LOGG	ER : R. Clennon
ſ	DEPTH B	TH BELOW SURFACE (FT)		FT)	SOIL DESCRIPTION					20		
		INTER//	AL (ET)				ŏ					
					SOIL NAME, USCS GROUP SYMBOL, COLOR		<u>1</u>	Zone	a		COMMENTS	WELL DIAGRAM
			RECOVE	±κΥ (F1)	MOISTURE CONTENT, RELATIVE DENSITY OR		BOL	hing .	space	Hole		
				SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		ΜY	3reat	Head	bove		
╉	164.6			#/TYPE			0)		_	<		
	104.0					-						
	_					_						
	_					_						- 18
	-					-			INFX			
	-					-						
	_					_						
	35 -					_						× × -
	159.6											
		36.0										
	_				Poorly Graded Sand (SP)	_						
	-				36.0-42.8° - same as above	_						- 🕅 🕅
	-					_						
	_					_			0.0			
	_					_						
	40					-						$\boxtimes \boxtimes -$
	154.6											
	_					_						
	-					_						- 12 12
	-					-						- 12
	_				De auto Orre de d. Oerre d. (OD)							
	_				A2 8-44 0' - dark grav (2 5X 4/1) to dark gravish brown (2 5X	_						
	_				4/2), moist, loose, fine-grained sand, little silt	_			0.0			- 🕅 🕅
	45				Poorly Graded Sand (SP)				0.0			
	149.6				44.0-45.7' - sane as above, but dark grayish brown (10YR 4/	2) _						
	-		15.6	SN-3	Poorly Graded Sand (SP)	_						88 -
	-				45.7-48.8' - dark grayish brown (2.5Y 4/2), moist, loose,	-		0.0		0.0		- 🕅 🕅
	-				fine-grained sand, trace silt	-						
	_					_						
	-					-						
	-				Sandy Silt (SM)	_			0.0			
	50_				48.8-49.2' - dark grayish brown (2.5Y 4/2), moist, dense,							
	144.6				Poorly Graded Sand (SP)							Ň Ň –
	-				49.2-51.6' - same as 44.0-45.7'	-						
	-				No Recovery		· · · · ·					
	_				51.6-56.0'	_						
	_					_						- 12 12
	-					-			INPC			
	-					-						
	55_											
	139.6	56.0				_						× × -
	-	30.0			Poorly Graded Sandy Silt (SP-SM)							
	_				56.0-58.3' - dark grayish brown (10YR 4/2), moist, moderate	_	日甘					
	_				dense, fine-grained sand, non-plastic	_						
	-						白白		0.1*			- 12
	-				Poorly Graded Sandy Silt (SP-SM)	-						
	_				58.3-66.5' - grayish brown (10YR 5/2), grayish brown, moist,	_	H:F					
	60				mouerate dense to loose, inte-granied sand		다는					$\bowtie$



### BORING NUMBER:

WI-CV-MW01-M SHEET 3 OF 7

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439611.4 N, 1202426.5 E)

ELEVATION: 194.6 ft

DRILLING CONTRACTOR : Cascade Drilling

DRILLING METHOD AND EQUIPMENT : Full-sized Sonic Rig (truck mounted) 4 x 6

V	VATER	LEVELS	<u>5 : 123.4 f</u>	t bgs	START : 12/9/10 13:10	END	: 12/	12/16	5 15:3	30	LOGO	ER : R. Clennon
	DEPTH E	PTH BELOW SURFACE (FT)		FT)	SOIL DESCRIPTION		(1)	R		25		
1							ŏ					
					SOIL NAME, USCS GROUP SYMBOL, COLOR		10	Zone	m		COMMENTS	WELL DIAGRAM
			RECOVE	ERY (F1)	MOISTURE CONTENT, RELATIVE DENSITY OR		BO	Buic	spao	Ноњ	00111121110	
				SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		Σ	reath	lead	bove		
╄	124.6			#/TYPE			S		-	A		
	134.0_					-	답답					- 13
	-					-						
	_					_						
	-					-						- 12
	-					-	Цŀ					- 🕅 🕅
	_					_	i i					
						_	남남		0.1*			
	65 129 6						南					
	120.0		10.5	01.4		-	임임					- 18
	_		10.5	5IN-4				0.0-		0.0-		
	-				No Recovery	_		0.1		0.1		- 🕅 🕅
	-				00.0-70.0	-						- 12
	_					_						
	-					_						- 12
	70					-						- 18
	124.6											
						_						
	-					-						Bentonite -
	-					-						Grout –
	-					_						
	_					_						- 🛛 🖓
	-					-			NR			- 🕅 🕅
	75					-						- 18
	119.6					_	1					
	-	76.0			Poorly Graded Sandy Silt (SM)		TEL					- 18
	-				76.0-88.5' - same as above, wet, in 76.0-81.0' (most likely fro	m –						- 🕅 🕅
	-				drilling mud), otherwise moist)							
	-					_						- 🕅 🕅
	-					-						K K -
	_					_			0.1*			
	80											
	114.0					-						- 🕅 🕅
	-					-						K K -
	-					_						
	-					-						K K -
	_					_		·				- 🕅 🕅
	-					_						
	0F -					-		1				- 🕅 🕅
	oo 109.6											K K –
				SN 5		-						
	-			014-0		_		0.0- 0.1		0.0- 0.1		
	-					-						- 🕅 🕅
	_					-						K K -
	-											
	-				Sandy Silt (SM)	_			0.1*			K K -
1	90				(10YR 4/2), moist to wet, dense, fine-grained sand non-plast	ic –			<b>0</b> .1			- 12
T												
I												



WI-CV-MW01-M SHEET 4 OF 7

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439611.4 N, 1202426.5 E)

ELEVATION: 194.6 ft

DRILLING CONTRACTOR : Cascade Drilling

WAIE	R LEVELS	<u>5 : 123.4 f</u>	t bgs	START : 12/9/10 13:10	END	: 12/	12/16	15:3	30	LOGG	ER : R. Clennon
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION				PID			
1		INTERVAL (FT)				8	R		55	]	
	INTERV	AL (FT)				IC L	_one			COMMENTS	WELL DIAGRAM
		RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		ğ	ing Z	pace	Hole	CONNENTS	
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		ΥME	reath	leads	Dove		
-			#/TYPE			S.	ā	Í	ЧÞ		
104.6	5			Poorly Graded Sand (SP)	_						- 🕅 🕅
	-			90.4-93.2' - dark gravish brown (10YR 4/2), moist, loose to	-	다는					XX -
	-			moderate dense, fine-grained sand, trace to few silt	_	티뷰					- 🕅 🕅
					_	出出					
	_				_	다는					- 18
	-			No Recovery	-						- 🕅 🕅
	-			93.2-96.0'	-			0.1*			
95	_				_						
99.6					-						K K -
	96.0			Poorly Graded Sand (SP)							99 -
	-			96.0-102.3' - same as above	-						
					_						
	-				_						
	-				-						98 -
					_		1	0.1*			
100	_				_						$\otimes \otimes $ $-$
94.0	-				_					*Amplent PID	X X -
	-				-					ppm (drift or due	
	]				_					to rainy/wet	
	_			Clay (CL)	_	, ////				conditions)	N N -
	-			102.3-109.8' - dark gray (10YR 4/1) to dark gray (GLEY1 4/	N), –						X X -
	-			moist, stiff to very stiff, medium to high plasticity, trace fine	_						
	]			subangular to subround gravel	_			0.2*			
105	-										$\otimes \otimes$ –
89.0	-				_						
	-		SN-6		-		0.0-		0.0-		
	]				_		0.1		0.1		
	_				_						- 🕅 🕅
	-				-						- 12
					_						
	_				_			0.1*			
110 84 6	-			Silt (ML)		r///	-				
04.0	-			109.8-113.0' - very dark gray (10YR 3/1) to very dark grayis	h –						- 🕅 🕅
	1			brown (10YR 3/2), moist, medium stiff, low plasticity	_						
	-				_						- 🕅 🖓
	-				-						
	-			Poorly Graded Silty Sand (ML)		$\parallel \parallel$	1				
	]			113.0-116.0' - dark grayish brown (2.5Y 4/2), moist, loose,	_						
115	-			tine-grained sand	_			0.1*			- 🕅 🖓
79.6	-										
	116.0										
				Sandy Silt (ML)	_	ЦT					
	-			TID.U-124.8' - Very dark gray (2.5Y 3/1) to very dark grayish brown (2.5Y 3/2) moist stiff non-plastic	-						- 🕅 🕅
	-			b(0)(1) (2.01 o(2), 10)(30, 30)(10)(1-p)(33)(0)	_						
	1				_						
	-				_			0.2*			X X -
120	-				-			0.2			- X X
120											УЛ ЦУЛ



WI-CV-MW01-M SHEET 5 OF 7

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439611.4 N, 1202426.5 E)

ELEVATION: 194.6 ft

DRILLING CONTRACTOR : Cascade Drilling

WATE	<u>R LEVELS</u>	<u>5 : 123.4 f</u>	t bgs	START : 12/9/10 13:10	END	<u>: 12/</u>	12/16	5 <u>15:</u> 3	30	LOGO	ER : R. Clennon
DEPTH	EPTH BELOW SURFACE (FT)		W SURFACE (FT) SOIL DESCRIPTION			0	R	PID FADIN	GS		
	INTERV	AL (FT)	ERY (ET)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		LIC LOG	Zone	8	<u>_</u>	COMMENTS	WELL DIAGRAM
		RECOVE	SAMPLE #/TYPF	MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMBO	Breathing	Headspac	Above Hol		
74.6 125 69.6 130 64.6 135 59.6 140 54.6 145 49.6		21.3	SN-7	<ul> <li>Sandy Silt (ML) <ol> <li>124.8-127.3' - same as above, color transitioning to very darl gray (GLEY1 3/N)</li> </ol> </li> <li>Sandy Silt (ML) <ol> <li>127.3-132.2' - very dark gray (GLEY1 3/N), moist, very stiff, non-plastic, mottled with grayish brown (2.5Y 5/2)</li> </ol> </li> <li>Poorly Graded Sandy Silt (SP-SM) <ol> <li>132.2-133.3' - very dark gray (10YR 3/1), moist to wet, coarse-grained sand, little fine subround to subangular grave Poorly Graded Sandy Silt and Gravel (SP-SM)</li> <li>133.3134.3' - dark gray (2.5Y 4/1), dark gray, moist, loose, fine-grained sand, fine to coarse subround to round gravel, win bottom 0.3'</li> <li>Poorly Graded Sandy Silt (SP-SM)</li> <li>134.3-136.0' - dark gray (2.5Y 4/1) to dark grayish brown (2.4/2), moist, loose, fine-grained sand, trace coarse sand and fine gravel</li> <li>Poorly Graded Sandy Silt (SP-SM)</li> <li>136.0-140.5' - dark gray (10YR 4/1), moist, moderate dense, fine-grained sand, little silt</li> </ol> </li> <li>Poorly Graded Sand (SP) <ol> <li>140.5-150.9' - dark gray (10YR 4/1), moist to wet, moderate dense, medium-grained sand, trace silt, trace coarse sand ar fine subangular gravel</li> </ol> </li> </ul>	<pre></pre>		0.0-0.1	0.2* 0.0 0.2*	0.0-0.1	Driller Note: Material feels more gravelly at ~141' bgs	- Bentonite 20/40 Sand



WI-CV-MW01-M SHEET 6 OF 7

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439611.4 N, 1202426.5 E)

ELEVATION: 194.6 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER	<u>LEVELS</u>	<u>5 : 123.4 i</u>	t bgs	START : 12/9/10 13:10	END	: 12/	12/16	5 15:3	30	LOGG	ER : R. Clennon
DEPTH	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		0	R		35		
1						ŏ	$\vdash$			4	
1						2	one	L		COMMENTS	WELL DIAGRAM
		RECOVE	ERY (FT)	MOISTURE CONTENT RELATIVE DENSITY OR		Ы	ng Z	Dace	ble	CONNENTS	
				CONSISTENCY, SOIL STRUCTURE, MINERALOGY		ΒB	athi	adsp	Ve F		
			SAMPLE #/TYPF			₹	Bre	£	Abo		
44.6			<i>"</i> ,,,,,,							*Amhient PID	
					_					readings - 0.0 -	· E · · · · · ·
-				Poorly Graded Sand (SP)	_					0.2 ppm (likely	
-				150.9-153.7' - same as above, silty sand, sandy silt stringers,	_					due to drift or	
				increasing moisture in 153.0-153.7'						rainy conditions)	: (물리) - [
					_						2" -
					_						Schedule -
-				No Recovery	_						80 - 0.010
455 -	_			153.7-156.0'	_			0.1*			Slot Screen
155											
39.0	150.0				-						): 日): i
	156.0			Boorly Graded Sand (SB)							[] [] -
-				156.0 150.2' venudark grav (CLEV1.3/N) Joose	-						)   E       -
-	-			medium-grained sand loose moist to wet trace silt and coars	- -						
-				sand	- 20	11 8					· . 🗐
-					_			0.0			
-					_						N 2 2 2 2
-						111					
160				159 2-162 5' - dark grav (GLEV1 4/N) moist stiff low to		///					
34.6				medium plasticity	_	V//	1				이 아이
-		10.5	SN-9	moduli plastoty	_	///	1				
-		10.0			_	V//	0.0		0.0		-
-					_	V///	1				A-11-1-1 _
-	-										
-	-			Clay (CL)		V//	1	0.0			-
-	-			102.5-100.0 - Same as above 150.0-159.2, lew small (0.2) s	- nu	///		0.0			<u>1. (.) (.) (.</u>
-	-			sungers	_	V///	1				-
165					-	///	1				=
29.6	-					V//	1				
	166.0				_	V//	1				-
-				Sandy Silt (ML)		<b>r</b> ( ( (					-
-				166.0-168.7' - dark greenish gray (GLEY1 4/1), moist, very	_						-
				stiff, no to low plasticity							
					_						
					_						_
-				Gravel (GP)	_						_
470 -	_			168.7-171.3' - dark gray (GLEY1 4/2), saturated, loose, some	_	1. 1		0.0			-
1/0	-			coarse sand, little silt							
24.0	-				-	•	I I	L			-
	-	12.3	SN-10		-	. ●	0.0	L	0.0		-
	1			Clay (CL)	-	V///	1	L	5.0		-
	1			171.3-172.3' - very dark gray (GLEY1 3/N), moist, stiff,	_	V///	1	L		Driller Note: Hit	=
1 -	1				_/=		1	1		silt/continuing	-
-	1			Poorly Graded Sandy Silt (SP-SM)	/-	י יו		I I		laver at 172' bos	-
	1			172.3-172.7' - very dark gray GLEY1 3/N), moist, moderate	17	l: /		I I		, <u>.</u>	
1 7				dense to loose, fine-grained sand	_/[-		I I	0.0			
175	1			Coarse Sand and Gravel (GP)			I I	I I			
19.6	1			172.7-173.7' - dark gray (10YR 4/1), saturated, loose,	r=	$\downarrow \downarrow \downarrow$	1	I I			_
	176.0			Coarse-grained sand, little fine to medium sand and silt	_  _	¥///	1	<u> </u>			-
1				Sandy Silt (ML)	-		I	L		*Ambient PID	-
1				173.7-175.3 - dark gray (GLEY1 9/N), moist, very stiff,	-		I I	I I		readings - 0.0 -	-
1					_  -		I	L		U.1 ppm	-
1					-		I I	I I			-
1				ven, stiff to bard, moderate plasticity	-		I I	I I			-
1				Potry still to flaru, moderate plasticity			I I	I I			-
1				BOILOTH OF BOILING AL 170.0 IL DQS OF 12/12/10 15:30	-		I I	I I			-
							1				
1							1	1			
L		1					1			1	



BORING NUMBER:

WI-CV-MW01-M SHEET 7 OF 7

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439611.4 N, 1202426.5 E)

ELEVATION: 194.6 ft

DRILLING CONTRACTOR : Cascade Drilling

	WATER LEVELS : 123.4 ft bgs		t bgs	START : 12/9/10 13:10	END	: 12/	12/16	15:3	30	LOGG	ER : R. Clennon	
	DEPTH F	DEPTH BELOW SURFACE (FT)			SOIL DESCRIPTION		IJ	R		GS		
	l I	INTERV/	AL (FT)				LO C	ē				
	l I	1	RECOVE	RY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		ОПО	oZ gr	ace	lole ble	COMMENTS	WELL DIAGRAM
		1		SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		YMB	eathir	eadsp	ove F		
-	ļ'	<b> </b>		#/TYPE			Ś	В	Í	Ab		
	l I	1				-					Water level	-
	l I	1				_					bgs and	-
	l I	1				-					dropping on 12/13: 123 43'	-
		1				_					bgs	-
	l I	1				-						-
	l I	1				_						-
	l I	1										
	l I	1				-						-
	l I	1				_						-
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BORING NUMBER:

WI-CV-MW02-M SHEET 1 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439065.1 N, 1202358.2 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER	LEVELS	:		START: 12/14/16 10:50 E	:ND :	12/1	9/16	10:4	-0	LOGG	ER : R. Clennon
DEPTH E	PTH BELOW SURFACE (FT)		FT)	SOIL DESCRIPTION					29		
						Ö			55		
	INTERVA	RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		30LIC L	ing Zone	pace	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		ΥME	reath	leads	bove		
400.4			#/TYPE			S	8	-	A		
193.1				Cleared vac truck/hand auger	-						- 12
-				0.0-5.0	-						
-					-						$\bowtie$
_					_						
					_						
_					_						
	<b>F</b> 0				-			NA			- 18
188 1	5.0			Poorly Graded Sand with Gravel (SP)							
100.1				5 0-6 4' - dark vellowish brown (10YR 4/4) wet coarse	-						$\boxtimes$ $\boxtimes$ -
_				medium to coarse sand, fine to large subround to round gravel	_						
				Poorly Graded Sand (SP)							
_				6.4-8.3' - dark yellowish brown (10YR 3/4), wet, loose,	_						
_				medium-grained sand, little fine to coarse-grained, trace to few	_						
-				Slit							99 - 19
-				8 3 16 7' brown (10VP 4/3) wet loose medium to	-			0.1			
10				coarse-grained sand few silt fine to coarse subround gravel	_						
183.1_				(cobbles to 0.5' diameter), gravel content increasing gravel	_						
_				content with depth	_						
-		11.7	SN-1		-		0.0		0.0		X X -
-					-		0.1*		0.0-		
-					-						
-					-						
					_						$\bigotimes$ $\bigotimes$ ]
					_						
15											$\bigotimes \bigotimes $ –
178.1_					-			0.0			
-					-						K K -
-					-						$\bowtie$
_				No Recovery	-						
	18.0			16.7-18.0	_						
_				Poorly Graded Sand with Gravel (SP)	_						
-				18.0-19.0' - brown (10YR 4/3), wet/saturated, fine to coarse	_						
20 -				round to subround gravel, coarse-grained sand	_/ _						- 12
1731				10.0.24.5' dark growich brown (2.5V.4/2) moist loose							
				medium-grained, trace to few coarse sand and silt, fine to	-						
				coarse subrounded gravel, cobbles to 0.6'	_			0.0			
					_						
-					_						
_					-						N N -
-					-						X X -
-					-						
25				Poorly Graded Sand with Gravel (SP)							
168.1				24.5-26.2' - dark grayish brown (2.5Y 4/2), moist, loose, few	_						$\boxtimes \boxtimes$
				gravel/fine to coarse, subangular to subround, fine to medium	_			0.44			
				sand, trace slit	/-	11		0.1*			
-		15.7	SN-2	Poorly Graded Sand with Silt and Gravel (SP-SM)	-	甘	0.0-		0.0-		$\bowtie$
_				20.2-28.8 - grayish brown (2.51 5/2), dry, loose, line sand, subangular fine to coarse gravel	-		0.1		0.1		
-					-						
				Dearly Graded Sand with Gravel (SD)		토					
				28 8-30 8' - same as 24 5-26 2'	_						
30						1.1					M M



## BORING NUMBER:

WI-CV-MW02-M SHEET 2 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439065.1 N, 1202358.2 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Full-sized Sonic Rig (truck mounted)

DEFINITION         OIL DESCRIPTION         OIL PROVENT (FT)         SOIL NAME LUGG GROUP SYMBOL, COLOR, MEDIVER (CONTRY (FT)         SOIL NAME LUGG GROUP SYMBOL, COLOR, MEDIVER (CONTRY C)         OOMENTS         WELL DIAGRAM.           163.1         SAMPLE         SOIL ANAME LUGG GROUP SYMBOL, COLOR, MEDIVER CONTRY (FT)         MORENTS         COMMENTS         WELL DIAGRAM.           163.1         SAMPLE         Poorly Graded Sand with Gravel (SP) 30.33.7 - dark grayish brown (2.5Y 4/2), mold, loose, fine-graned sand, trace silt.         0.1         0.1         0.1           35         3.0         No Recovery 33.7 - 36.0         50.4 (SP) 30.4.2.5 - 40.7 - dark grayish brown (2.5Y 4/2), mold, loose, fine sand, trace silt         0.2         0.2         0.2           40         10.7         SN-3         Poorly Graded Sand (SP) 42.5 - 40.7 - dark grayish brown (2.5Y 4/2), mold, loose, fine sand, trace silt         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2         0.2	WAIER	R LEVELS	5:	-	START : 12/14/16 10:50	END	: 12/	19/16	5 10:4	10	LOGG	ER : R. Clennon
MTERVAL (FT)         SOL NAME: USCS GROUP SYMBOL. COLOR MOSTURE CONTENT, RELATIVE DENSITY OR MOSTURE CONTENT MOSTURE CONTENT ACCOUNTENT MOSTURE CONTENT, RELATIVE DENSITY OR MOSTURE CONTENT ACCOUNTENT MOSTURE CONTENT, RELATIVE DENSITY OR MOSTURE CONTENT ACCOUNTENT MOSTURE CONTENT, RELATIVE DENSITY OR MOSTURE CONTENT ACCOUNTENT MOSTURE CONTENT ACCOUNTENT MOSTURE CONTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNTENT ACCOUNT	DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION					~~		
RECOVERY (PT)         SOLVAME.USCS GROUP SYMBOL COLOR. CONSISTENCY: SOL STRUCTURE, MINERALORY CONSISTENCY: SOL STRUCTURE, MINERALORY CONSISTENCY: SOL STRUCTURE, MINERALORY CONSISTENCY: SOL STRUCTURE, MINERALORY CONSISTENCY: SOL STRUCTURE, MINERALORY Solution, Caroline, Solution, Caroline, Solu		INTERV	AL (FT)				C LOG	е e				
SAMPLE         CONSISTENCY, SOL STRUCTURE, MNERALOGY         E         B         A         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B         B			RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		BOLIG	hing Zo	space	Hole	COMMENTS	WELL DIAGRAM
163.1       Poorly Graded Sand with Gravol (SP)         30.8.33.7* dark grayish brown (2.5Y 4/2), moist, loose, fine-grained sand, trace silt, trace coarse subrounded gravel       0.1         35.1       36.0       Poorly Graded Sand (SP)         36.0       Poorly Graded Sand (SP)       0.2         36.0.1       36.0.42.5*.0ark grayish brown (2.5Y 4/2), moist, loose, fine sand, trace silt       0.2         40       10.7       SN-3       Poorly Graded Sand (SP)         36.0.42.5*.0ark grayish brown (2.5Y 4/2), moist, loose, fine sand, trace silt       0.2         45.1       No Recovery       36.0.42.5*.0ark grayish brown (2.5Y 4/2), moist, loose, fine sand, trace silt         45.1       No Recovery       46.7*.50.0*         148.7       50.0       Poorly Graded Sand (SP)         45.7       50.0       Poorly Graded Sand (SP)         45.7       50.0       Poorly Graded Sand (SP)         45.7       50.0       Poorly Graded Sand (SP)         46.7*50.0*       Gard Gard Gard (SP)       0.3         55.1       50.0       Poorly Graded Sand (SP)       0.3         55.1       50.0       Poorly Graded Sand (SP)       0.2         55.1       50.0       Poorly Graded Sand (SP)       0.2         55.1       50.0       Poorly Graded Sand (SP)				SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYM	Breat	Head	Above		
35         36.0         Poorly Graded Sand (SP) 30.8-33.7-36.0'         0.1         0.1         0.1           35         36.0         Poorly Graded Sand (SP) 33.7-36.0'         0.1         0.1         0.1           36.0         Poorly Graded Sand (SP) 36.0.42.5' dark grayish brown (2.5Y 4/2), moist, loose, fine sand, trace silt         0.1         0.1           40         10.7         SN-3         Poorly Graded Sand (SP) 42.5-46.7' - dark grayish brown (2.5Y 4/2), moist, loose, fine sand, trace silt         0.1           45         148.1         10.7         SN-3         Poorly Graded Sand (SP) 42.5-46.7' - dark grayish brown (2.5Y 4/2), moist, loose, fine sand, trace silt         0.2         0.2           45         148.1         1         10.7         SN-3         Poorly Graded Sand (SP) 42.5-46.7' - dark grayish brown (2.5Y 4/2), moist, loose, few grayish brown (10YR 4/2) silt stringers/stiff, moist         0.2         0.2           50         50.0         10.7         SN-3         Poorly Graded Sand (SP) 50.0-56.8' - very dark grayish brown (10YR 3/2), moist, loose, fine sand, trace silt         0.2         0.3         10.7           51         18.1         1         10.7         SN-3         Poorly Graded Sand (SP) 50.0-56.8' - very dark grayish brown (10YR 3/2), moist, loose, fine sand, trace silt         0.2         0.2           52         138.1         1 <t< td=""><td>163.1</td><td>-</td><td></td><td></td><td></td><td>_</td><td></td><td></td><td></td><td></td><td></td><td>- X X</td></t<>	163.1	-				_						- X X
35         30.0         30.7.30         30.00         37.40         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         100000         10000         10000					Poorly Graded Sand with Gravel (SP)	_			0.1*			
35         36.0         No Recovery         33.7.36.0°           38.1         36.0         Poorly Graded Sand (SP)         0.7           36.0         10.7         SN-3         Poorly Graded Sand (SP)         0.7           40         153.1         10.7         SN-3         Poorly Graded Sand (SP)         0.2           45         148.1         10.7         SN-3         Poorly Graded Sand (SP)         0.2           45         148.1         10.7         SN-3         Poorly Graded Sand (SP)         0.2           45         148.1         10.7         SN-3         Poorly Graded Sand (SP)         0.2           45         148.1         10.7         SN-3         Poorly Graded Sand (SP)         0.3           143.1         10.7         SN-3         Poorly Graded Sand (SP)         0.3         0.3           143.1         10.7         SN-3         Poorly Graded Sand (SP)         0.3         0.3           143.1         10.7         SN-3         Poorly Graded Sand (SP)         0.3         0.3           143.1         10.7         SN-3         Poorly Graded Sand (SP)         0.3         0.3           143.1         10.7         Poorly Graded Sand (SP)         0.3         0.3		_			fine-grained sand, trace silt, trace coarse subrounded gravel	-						99 -
36.         No Recovery           33.7.36.0'	-					_						
35       158.1       33.7-36.0       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	-	-			No Recovery			_				
168.T       36.0       Poorty Graded Sand (SP) 30.0-42.5 · dark grayish brown (2.5Y 4/2), moist, loose, fine sand, trace silt       0.2       0.2         40       153.T       10.7       SN-3       Poorty Graded Sand (SP) 42.5-46.7 · dark grayish brown (2.5Y 4/2), moist, loose, fine grayish brown (10YR 4/2) silt stringers/stiff, moist       0.4       0.5         45       148.1       No Recovery 46.7-50.0'       0.5       0.5       0.5         143.1       S0.0       Poorty Graded Sand (SP) fine sand, trace silt       0.5       0.5         50       50.0       Poorty Graded Sand (SP) fine sand, trace silt       0.5       0.5         50       50.0       Poorty Graded Sand (SP) fine sand, trace silt       0.5       0.5         51       50.0       Poorty Graded Sand (SP) fine sand, trace silt       0.5       0.5         55       50.0       Poorty Graded Sand (SP) fine sand, trace silt       0.5       0.2         55       S0.0       Poorty Graded Sand (SP) fine sand, trace silt       0.5       0.5         55       S0.0       Poorty Graded Sand (SP) fine sand, trace silt       0.5       0.2         55       Poorty Graded Sand (SP)       0.5       0.5       0.5         56       Poorty Graded Sand (SP)       0.5       0.5       0.5	35	_			33.7-36.0'	-						- X X
40         900         Poorly Graded Sand (SP) 30.0-42.5 - dark grayish brown (2.5Y 4/2), moist, loose, fine sand, trace silt         0.2         0.2           40         10.7         SN-3         Poorly Graded Sand (SP) 42.5-46.7 - dark grayish brown (2.5Y 4/2), moist, loose, fine grayish brown (10YR 4/2) silt stringers/stiff, moist         0.2         0.2         0.2           45         148.1         No Recovery 46.7-50.0         No Recovery 46.7-50.0         0.2         0.2         0.2         0.2           50         50.0         Poorly Graded Sand (SP) 50.0-56.8 - very dark grayish brown (10YR 3/2), moist, loose, fine sand, trace silt         0.2         0.2         0.2         0.2           51         50.0         Poorly Graded Sand (SP) 50.0-56.8 - very dark grayish brown (10YR 3/2), moist, loose, fine sand, trace silt         0.2         0.2         0.2           52         53.1         Poorly Graded Sand (SP) 50.0         0.2         0.2         0.2         0.2           143.1         Poorly Graded Sand (SP) 50.0         Poorly Graded Sand (SP)         0.2         0.2         0.2         0.2           55         138.1         Poorly Graded Sand (SP)         0.2         0.2         0.2         0.2	158.1	200				_			0.2*			
36.0-42.5° - dark grayish brown (2.5Y 4/2), moist, loose, fine         40         10.7       SN-3         Poorty Graded Sand (SP)         42.5-46.7° - dark grayish brown (2.5Y 4/2), moist, loose, few         grayish brown (10YR 4/2) silt stringers/stiff, moist         0.7         0.8         10.7         SN-3         Poorty Graded Sand (SP)         42.5-46.7° - dark grayish brown (10YR 4/2), moist, loose, few         grayish brown (10YR 4/2) silt stringers/stiff, moist         0.7         0.8         50         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0         50.0		30.0			Poorly Graded Sand (SP)	_						
40       10.7       SN-3       Poorly Graded Sand (SP)       0.2       0.2       0.2         45       148.1       10.7       SN-3       Poorly Graded Sand (SP)       0.2       0.2       0.2       0.2         45       148.1       1       No Recovery       46.7-50.0'       0.3       0.3       0.2       0.3       0.2         50       50.0       50.0       50.0-56.6''' very dark grayish brown (10YR 3/2), moist, loose, fine sand, trace sitt       0.3       0.3       0.3       0.3       Cetting difficultient PID readings to 0.1-0       0.2       0.3       0.3       0.2       0.2       0.3       0.2       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3       0.3	-	_			36.0-42.5' - dark grayish brown (2.5Y 4/2), moist, loose, fine sand, trace silt	-						- 🕅 🕅
40       10.7       SN-3       Poorly Graded Sand (SP)         45       148.1       -       -       -       -       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2       0.2 <td></td> <td>-</td> <td></td> <td></td> <td></td> <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		-				_						
40         153.1         10.7         SN-3         Poorly Graded Sand (SP) 42.5-46.7 - dark grayish brown (10YR 4/2) silt stringers/stiff, moist         0.2         0.2         0.2           45         148.1         1         10.7         SN-3         Poorly Graded Sand (SP) grayish brown (10YR 4/2) silt stringers/stiff, moist         0.2         0.3         0.2         0.3         0.2           45         148.1         1         1         1         1         1         1         1         1         0.3         0.2         0.3         0.2         0.3         0.2         0.3         0.2         0.3         0.2         0.3         0.2         0.3         0.2         0.3         0.2         0.3         0.3         0.2         0.3         0.2         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3         0.3 <td>-</td> <td></td> <td></td> <td></td> <td></td> <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	-					_						
153.1       10.7       SN-3       Poorly Graded Sand (SP) 42.5 46.7' - dark grayish brown (2.5Y 4/2), moist, loose, few grayish brown (10YR 4/2) silt stringers/stiff, moist       0.2       0.3       0.2         45       148.1       1       10.7       SN-3       Poorly Graded Sand (SP) 42.5 46.7' - dark grayish brown (2.5Y 4/2), moist, loose, few grayish brown (10YR 4/2) silt stringers/stiff, moist       0.3       0.3       0.3       0.4         45       148.1       1       Poorly Graded Sand (SP) 50.0-56.8' - very dark grayish brown (10YR 3/2), moist, loose, fine sand, trace silt       0.3       "Getting drift/ambient PID readings to 0.1- 0.2 ppm       *Getting 0.4         55       138.1       1       Poorly Graded Sand (SP) 50.0-56.8' - very dark grayish brown (10YR 3/2), moist, loose, fine sand, trace silt       0.2       0.2         9       Poorly Graded Sand (SP) 50.0-56.8' - very dark grayish brown (10YR 3/2), moist, loose, fine sand, trace silt       0.2       0.2	40	-				-						- 12 13
45       10.7       SN-3       Poorly Graded Sand (SP) 42.5-46.7 - dark grayish brown (2.5Y 4/2), moist, loose, few grayish brown (10YR 4/2) silt stringers/stiff, moist       0.0 0.2 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3	153.1	-				_			0.2*			
45       10.7       SN-3       Poorly Graded Sand (SP) 42.5-46.7 · dark grayish brown (2.5Y 4/2), moist, loose, few grayish brown (10YR 4/2) silt stringers/stiff, moist       0.0 0.2       0.3       0.0 0.2       0.3       0.0 0.2       0.3       0.3       0.4       0.3       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4 <td>-</td> <td>_</td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	-	_				-						
45       10.7       SN-3       Poorly Graded Sand (SP)       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0 <td< td=""><td>-  </td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td>- 🕅 🕅</td></td<>	-					-						- 🕅 🕅
45       148.1	-		10.7	SN-3	Poorly Graded Sand (SP)	_						
45       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	-				grayish brown (10YR 4/2) silt stringers/stiff, moist	_		0.2*		0.2*		
148.1     No Recovery       46.7-50.0'     -       50     50.0       143.1     Poorly Graded Sand (SP)       50.0-56.8' - very dark grayish brown (10YR 3/2), moist, loose, fine sand, trace silt     -       55     -       138.1     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     -       -     - <t< td=""><td>45</td><td>-</td><td></td><td></td><td></td><td>-</td><td></td><td></td><td>0.3*</td><td></td><td></td><td>- 14 16</td></t<>	45	-				-			0.3*			- 14 16
S0     50.0       143.1       55       138.1       9       Poorly Graded Sand (SP)       0.2*	148.1					_						
No Recovery       46.7-50.0'       50       50.0       143.1       50.0-56.8' - very dark grayish brown (10YR 3/2), moist, loose, fine sand, trace silt       55       138.1       9       755       138.1       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9       9    <						_						
50     50.0       143.1       50       143.1       50.056.8' - very dark grayish brown (10YR 3/2), moist, loose, fine sand, trace silt       55       138.1       755       138.1       755       138.1       755       138.1       755       138.1       755       138.1       755       138.1       755       138.1       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755       755	-				No Recovery	-						- 🛛 🖓
50     50.0       143.1     Poorly Graded Sand (SP)       50.0-56.8' - very dark grayish brown (10YR 3/2), moist, loose, fine sand, trace silt       55       138.1       9       755       138.1       9       9       9       9       9       9       9       9       9       138.1       138.1	-				46.7-50.0	-			0.3*			
50     50.0       143.1     Poorly Graded Sand (SP)       50.0-56.8' - very dark grayish brown (10YR 3/2), moist, loose, fine sand, trace silt       55       138.1       138.1       Poorly Graded Sand (SP)       Poorly Graded Sand (SP)	-					_						
143.1       Poorly Graded Sand (SP)         50.0-56.8' - very dark grayish brown (10YR 3/2), moist, loose, fine sand, trace silt       neadings to 0.1-         55       0.2*         138.1       Poorly Graded Sand (SP)         Poorly Graded Sand (SP)       0.2*	50 -	50.0				-					*Getting drift/ambient PID	22 -
55 138.1 Poorly Graded Sand (SP)	143.1	_			Poorly Graded Sand (SP)						readings to 0.1-	× × ×
55 138.1 - - - - - - - - - - - - - - - - - - -					fine sand, trace silt	-, _					0.2 ppm	
55 138.1 - - - - - - - - - - - - - - - - - - -	-	_				_						22 -
55     -     -     -     -     0.2*       138.1     -     -     -     -     -       -     -     -     -     -     -       -     -     -     -     -     -       -     -     -     -     -     -       -     -     -     -     -     -       -     -     -     -     -     -       -     -     -     -     -     -       -     -     -     -     -     -       -     -     -     -     -     -	-					_						×× ×
55     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     - </td <td>-</td> <td>-</td> <td></td> <td></td> <td></td> <td>_</td> <td></td> <td></td> <td>0.0*</td> <td></td> <td></td> <td></td>	-	-				_			0.0*			
138.1 Poorly Graded Sand (SP)	55 -					-			0.2*			- 🕅 🕅
Poorly Graded Sand (SP)	138.1					_		·				× × ·
Poorly Graded Sand (SP)		1				_						
	-	-			Poorly Graded Sand (SP)	-						- 🕅 🕅
11.7 SN-4 Sand, few to little silt 56.8-61.1' - dark grayish brown (2.5Y 4/2), moist, loose, tine	-		11.7	SN-4	56.8-61.7' - dark grayish brown (2.5Y 4/2), moist, loose, fine sand, few to little silt	_		0.0-	0.2*	0.0-		
		1				_		0.0*		0.0*		
	60											



WI-CV-MW02-M SHEET 3 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439065.1 N, 1202358.2 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER	LEVELS	:		START : 12/14/16 10:50	END	12/	<u>9/16</u>	10:4	0	LOGG	ER : R. Clennon
DEPTH E	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		<b>6</b>	р				
						Ö	R		5		
	INTERVA	AL (FT)				U U	one				
		RECOVE	ERY (FT)	SUIL NAME, USUS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		0L	Z BL	ace	lole	CONNENTS	
				CONSISTENCY, SOIL STRUCTURE, MINERALOGY		MB	athi	adsp	ve F		
			#/TYPE			S	Bre	Не	Abc		
133.1											
					_						
_					_						
_				No Recovery	_						N N -
-				61.7-66.0'	_						- 12 12
_					-						- 🕅 🕅
-					-						X X -
-					-			0.2*			
65					_						
128.1_					_						KI KI –
_	66.0			De subs Oue de d.O.e. d. (OD)						Deillen Matai	- 12 12
_				66.0.71.2' dark growich brown (2.5V.4/2) moist loose fine	-					Driller Note:	XX -
-				sand trace silt	-					and drilling into a	- 18
_					-					water table in the	- 12
					_					66-86' bgs	$\otimes \boxtimes$
_					_					interval	- XX
					_						K K -
123 1								0.2*			$\otimes$ $\otimes$ $-$
120.1					-			0.2			- 12 12
-					_						N N -
-				(Poorly Graded) Silty Sand (SM)	-						
				$71.3-72.0^{\circ}$ - dark gray (2.5Y 41) to dark grayish brown (2.5Y	/_						
_				Poorly Graded Sandy Silt (SD SM)		¦다					× × -
_				72 0-82 7' - dark gravish brown (2 5Y 4/2 to 10YR 4/2 moist		南臣					- 🕅 🕅
_				loose to medium dense, fine sand	., _	이는		0.3*			Bentonite -
75					_	답답					Grout –
118.1						南臣					
		16.7	SN-5		_						
_		10.7			_	남남	0.2*		0.2*		N N -
_					_	白白					XX -
-					-						- 🕅 🕅
-					-	무다					- 12
					_	同臣					
					_	다는		0.3*			
80						답답					
113.1					_	同臣					- 🕅 🕅
-					-						KA KA -
-					-	¦다					N N -
_					_	同時					
				No Recovery		1.11.					
-				82.7-86.0'	_						- 12 12
-					-			NR			- 🕅 🕅
85					-						- 🕅 🕅
108.1											
	86.0										
				Poorly Graded Sandy Silt (SP-SM)	_						KA KA –
_				86.0-96.3' - same as above	_	답답					- XX (
-					-	前					X X -
-					-	臣臣					- 18
-					-	답답					
					_	臣臣		0.2*			
90						민민					$\bowtie$



BORING NUMBER: WI-CV-MW02-M

SHEET 4 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439065.1 N, 1202358.2 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Full-sized Sonic Rig (truck mounted)

WATER LEVELS : ---START : 12/14/16 10:50 END: 12/19/16 10:40 LOGGER : R. Clennon DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 103.1 95 98.1 0.2* 18.6 SN-6 0.0 0.0-0.2' Poorly Graded Sandy Silt (SP-SM) 96.3-99.0' - dark gray brown (10YR 4/2), moist, moderate dense to dense, fine sand Poorly Graded Sandy Silt (SP-SM) 0.2* Ambient PID 99.0-104.4' - dark gray (10YR 4/1) to very dark gray (10YR 3/1), moist, dense, fine sand, non-plastic 100 readings of 0.2 93.1 ppm - likely drift due to equipment 0.2 No Recovery 105 104.4-106.0' 88.1 106.0 Silty Sand (SM) 106.0-114.7' - dark gray (2.5Y 41) to dark gray 10YR 3/1), moist to very moist, dense, fine sand, non-plastic 110 0.0 83.1 0.1 115 Sandy Silt (ML) 78.1 114.7-115.8' - dark gray (10YR 4/1) to very dark gray (10YR 3/1), moist, stiff, fine sand, no to low plasticity 18.1 SN-7 0.1 0.1 Clayey Silt (ML) 115.8-120.5' - dark gray (10YR 4/1), moist, very stiff, few lenses of fine-grained sand, moderate plasticity, transitioning to dark grayish brown (2.5Y 4/2) and olive brown (2.5Y 4/3) in 120.0-120.5' 0.3 120





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WI-CV-MW02-M SHEET 5 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439065.1 N, 1202358.2 E)

#### ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER	LEVELS	<u>:</u>		START : 12/14/16 10:50 Ef	ND :	12/	19/16	10:4	-0	LOGG	ER : R. Clennon
DEPTH E	BELOW SU	JRFACE (	FT)	SOIL DESCRIPTION				PID			
1					-	00	R		50		
	INTERVA	\L (⊢ Г)				Ľ ن	ane				
		RECOVE	RY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		Ĭ	oZ E	ge	e	COMMENTS	WELL DIAGRAM
			. ,	MOISTURE CONTENT, RELATIVE DENSITY OR		B	hing	lspa	Ч		
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		Σ	reat	leac	9VOC		
			#/TYPE			Ś	В	4	At		
73.1											
				Silty Sand (SM)	_						
_				_ 120.5-121.5' - dark grayish brown (2.5Y 4/2), moist to wet,	_						
_				\loose to medium dense, fine sand, trace to few clay, non-plastic	/_						
_				Silt with Sand and Clay (ML)	_						
_				121.5-124.1' - dark grayish brown (2.5Y 4/2), moist to wet,	_						
_				very stiff, little clay lenses, fine-grained sand, trace coarse sand	_						- 12 12
_				and fine gravel, low plasticity	_			0.44			
405 -				No Recovery	_			0.1*			- 12
125				124.1-126.0							
68.1	100.0				_						KA KA –
_	126.0										- 12 12
_				Sandy Clay (CL)	_						- 12
_				126.0-127.1 - grayish brown (2.5Υ 5/2), moist, very stiff, fine	_	[[[]					- 🕅 🕅
_				sand, lew line to coarse subround to round gravel, moderate	/-						- 12
-				plasticity	/ _						K K -
-				Poorty Graded Sand (SP)	-	t, te					
-				127.1-131.0' - dark grayish brown (2.5Y 4/2), very moist to wet,	-			0.1*			
120 -				loose, fine sand, little silt, trace fine to coarse subround gravel	-			0.1			- 12
63.1											$ \otimes$ $\otimes$
00.1					-	ti ti					KA KA -
-				Poorly Gradod Sandy Silt (SP-SM)		111					- 12
-				131.0.136.0' dark gravish brown (2.5V.4/2) moist loose ven	-	귀류					- 12
-				fine sand	-	1 li					K K -
-					-	물문					$\neg$
-					-						
-					-	남남					
-					-	금날		0.1*			- 12
135					-	금물					
58.1						다					
					-	다					
-		16.4	SN-8	Poorly Graded Sand (SP)		- <u></u>	0.0-		0.0-		
-				136.0-140.0' - dark gravish brown (2.5Y 4/2), very moist, loose.	-		0.1*		0.1*		
-				fine to medium sand	_						
-					_						
_					_						
_					_						$\bigotimes$
					_	e ir		0.1*			
140					_						
53.1				Poorly Graded Sandy Silt (SP-SM)		11					
				140.0-142.4' - same as 131.0-136.0'		신간					
_					_	금답					
					_	招					
_					_						
_					_						N N -
_				142.4.1-140.0	_						
_					_			0.4*			$\bowtie$
					_			0.1*			- 🛛 🖓
40.1	146.0				-						
-	140.0			Bearly Creded Sand (SD)							
-				146.0 154.1' some as 126.0 140.0' grain size increasing with	-						$\boxtimes$ $\boxtimes$ -
-				depth	-						- Ka Ka
-				uepui	-						
-					-		1	0.2*			
-					-		1				
-					-		1				- Bentonite
150					-						Chips –
						•					



BORING NUMBER: WI-CV-MW02-M

SHEET 6 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439065.1 N, 1202358.2 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Full-sized Sonic Rig (truck mounted)

WATER LEVELS : ---START : 12/14/16 10:50 END: 12/19/16 10:40 LOGGER : R. Clennon DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole Breathing 7 MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 43.1 Ambient PID readings up to -20/40 Sand 0.1 ppm 0.3 Lean Silty Clay (CL) 155 154.1-155.1' - dark gray (10YR 4/1), moist, stiff, low plasticity 38.1 Poorly Graded Sand (SP) 155.1-162.5' - same as 136.0-140.0' 14.7 SN-9 0.0 0.1 0.0-0.1* Schedule 80 - 0.010-Slot Scree 0.3 160 33.1 Clay Lens (CL) 162.5-163.2' - dark gray (10YR 4/1 to GLEY 4/N), moist, very stiff to hard, medium plasticity 0.2 Poorly Graded Sand (SP) 165 163.2-164.4' - dark gray (GLEY1 3/N), moist, loose, fine to 28.1 medium sand, little clay and silt, trace to little fine to coarse 166.0 subround to subangular gravel Clay Lens (CL) 164.4-164.9' - very dark gray (10YR 3/1 to GLEY 3/N), moist, moderate dense, fine-grained sand, little silt, trace coarse sand and fine-grained 02 Poorly Graded Sand (SP) 164.9-165.7' - very dark gray (10YR 3/1 to GLEY1 3/N), moist, medium dense, fine-grained sand, little silt, trace coarse sand 170 and fine gravel 23 Ī No Recovery 11.0 SN-10 165.7-166.0' 0.0-0.0-Clayey Silt (ML) 166.0-174.5' - dark gray (GLEY1 3/N) to dark greenish gray (GLEY1 4/1), moist, very stiff to hard, low to no plasticity, trace coarse sand, fine gravel 0 1 - coarse sand/gravel dense at 169.3-169.6' 175 Silt (ML) 174.5-176.0' - very dark greenish gray (GLEY1 3/1) to 18.1 176.0 greenish black (2.5Y 4/1), damp to moist, stiff Silty with Sand (ML) 176.0-178.2' - very dark gray (GLEY1 3/N), moist, very stiff, fine sand Sandy Clay (CL) 178.2-186.0' - very dark greenish gray (GLEY1 3/1), moist, 0.2 stiff to very stiff, low to medium plasticity 180



BORING NUMBER:

WI-CV-MW02-M SHEET 7 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439065.1 N, 1202358.2 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Full-sized Sonic Rig (truck mounted)

WATER	<u>LEVELS</u>	:		START : 12/14/16 10:50 E	<u>END :</u>	12/1	9/16	10:4	10	LOGG	ER : R. Clennon
DEPTH E	ELOW SI	JRFACE (	(FT)	SOIL DESCRIPTION		Ċ	RF		GS		
	INTERVA	L (FT)		SOIL NAME, USCS GROUP SYMBOL, COLOR,	Π	LIC LO	Zone	e	٥	COMMENTS	WELL DIAGRAM
		RECOVE	SAMPLE #/TYPE	MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMBO	Breathing	Headspar	Above Ho		
13.1 _		11.0	SN-11		-		0.0- 0.1*		0.0-	Note: Set isolation casing at 176' (8	
- - - 185_ 8.1							0.1	0.2*		casing), seal with bentonite pellets 170-176' bgs (3 50-lb buckets), drill from 176' bgs using telescoping 6 casing, 4 core	- - - - - - - -
	186.0			Sandy Clay (CL) 186.0-191.4' - dark greenish gray (GLEY1 3/1), moderate stiff to very stiff, moist, moderate plastic, fine sand, some silt, trace coarse subround to subangular gravel				0.2*		barrel	
190 3.1 				Silty with Sand (ML)				0.2			
- - - 195_ -1.9				yellowish brown (10YR 4/6), moist, very stiff to hard, trace fine to coarse subround to subangular gravel, fine sand low plasticity	-			0.2*			
-		20.8	SN-12	Clayey Sand (SC) 195.2-199.0' - dark greenish gray (GLEY1 4/1), moist, dense to moderate dense, no to low plasticity	- 0 - - - - -		0.0- 0.1*		0.0- 0.1*		
200 -6.9 				Poorly Graded Sand with Silt and Clay (SP-SM) 199.0-200.2' - very dark greenish gray (GLEY1 3/1), moderate dense to dense, fine-grained sand, trace course subangular gravel Silt (ML) 200.2-205.2' - dark greenish gray (GLEY1 4/1) mottled with dark yellowish brown (10YR 4/6), moist, dense (somewhat friable), some very fine sad, little clay, non-plastic, slight				0.2*		*Ambient PID reading up to 0.1 ppm	
 205 -11.9	206.0			Clayey Silty Sand (ML) 205.2-206.0' - brown (10YR 4/2), moist, very dense to dense,	- - - -			0.2			
				very fine sand, non-plastic Clayey Sand (SC) 206.0-211.0' - dark grayish brown (2.5Y 4/2), very moist, very dense, fine sand, few clay and silt stringer, trace coarse sand, non-plastic	   						
210						[]/]].					





## BORING NUMBER:

WI-CV-MW02-M SHEET 8 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439065.1 N, 1202358.2 E)

#### ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

WAIER	<u>R LEVELS</u>	; :		START : 12/14/16 10:50	END	: 12/	19/10	<u>5 10:</u> 4	10	LOGG	ER : R. Clennon
DEPTH	DEPTH BELOW SURFACE (FT)			SOIL DESCRIPTION		PID READINGS		~~			
1		NI (ETC)				۱ö			33		
1	INTERVA	<b>\</b> ∟ (⊢∣)				0	one			001415150	
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		Ē	g Zd	ace	e	COMMENTS	WELL DIAGRAIN
			. ,			βğ	thi	dsb	ъ		
			SAMPLE	CONSISTENCE, SOIL STRUCTURE, MINERALOGE		ž	Srea	Hear	òq		
- 10.0			#/TYPE			0)			<		
-16.9	-				-	///		0.2			-
-	-			Construction (ML)		<b> </b> ///	2				-
-	-			Sandy Slit (ML)	-						-
-	-			211.0-212.5 - Oark grayish brown (2.51 4/2), molie with dat	к						-
-	-			$\sim$ yellowish brown (10 m 4/0), moist to very moist, very dense $\sim$ non-plastic	, _		-				-
-	-				/ -						-
-				212 5 214 5' dark greenish grav (CLEV1 4/1) dry to moist	-						-
-				very dense low to no plasticity				0.2*			-
215				Silty Sandy Clay (CL)		$\overline{V}/$	7				-
-21.9				214 5-216 25' - dark vellowish brown (1oYR 4/6) moist har		V//	1				
		21.1	SN 13	low to moderate plasticity		///					
		21.1	514-15	Silty Clay (CL)			4 0.0- 0 1*		0.0-		-
-				216 25-222 5' - dark gravish brown (2 5Y 4/2) and olive	_	V//			0.1		-
-	_			brown (2.5Y 4/3), very moist, very stiff, little very fine sand.	-	V//					-
-	-			trace coarse sand. low plasticity	_	V//					-
- 1	4				-	V//.	1	1			-
	-				-	V//	3	1			-
220 -	1				-	V//.		1			-
-26.9	1					<i>V///</i>	1	0.2*			
20.0	-				-	///					-
-	-				-	///	1				-
-					-	///					-
-					-	V//	1				-
-				Silt with Clay (CL/ML)			1				-
				222.5-225.0' - dark greenish gray (GLEY1 4/1), dry to moist							_
				mottling with dark yellowish brown (10YR 4/6), dark yellowis	h _	$ \mathcal{A} $					_
_				brown in 223.0-224.5', very stiff to hard, little very fine sand,	_	A					_
225	_			low plasticity		14					
-31.9	000.0			Sandy Silt (ML)	-			0.1*			-
-	220.0			_ 225.0-226.0' - dark greenish gray (GLEY1 4/1) with dark	_		-				-
-	-			Vellowish brown (10 PR 4/6), moist, very hard, non-plastic	/ -						-
-	-			Sandy Silt (ML)	-						-
-				226.0-230.0 - Very dark gray (2.51 3/1), very moist to wet,	-						-
-	-			very suit, non-plastic	-						-
	1				-	1	1	1			-
					_		1	0.2*			-
230	1						1	1			
-36.9				Sandy Silt (ML)	_		1	1			
-				230.0-232'.0' - same as above, but moist, hard	_		1	1			_
- 1	4				-		1	1			-
- 1	-			Condu Cilé (MIL)			-	1			-
	-			Januy Jill (ML) 232 0 243 0 very dark gray (2 5V 2/1) wat stiff to your sti	ff –		1	1			-
	1			fine sand no plasticity	'', _		1	1			-
	1			into dana, no pidouoity	-		1	1			-
	1				-		1	1			-
235	1				-	1	1	1			-
-41.9	1					1	1	0.2*			
1 -	]	20.0	SNI 14		-		1	1			-
	1	20.0	JIN-14		_		0.0-	1	0.0-		
	1				_		0.1	1	0.1		_
- I	4				_		1	1			-
- 1	-				_		1	1			-
	4				-		1	1			
	-				-		1	0.2*			-
240	1				-		1	0.2			-
240							1	1			
1							1	1			
							1				



## BORING NUMBER:

WI-CV-MW02-M SHEET 9 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439065.1 N, 1202358.2 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Full-sized Sonic Rig (truck mounted)

				START : 12/14/16 10:50	END : 12/19/16 10:40 LOGGER : I			ER : R. Clennon			
DEPTH BELOW SURFACE (FT)				SOIL DESCRIPTION		(1)	R		38		
	INTERVA	L (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		SOLIC LOC	ing Zone	space	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above		
-46.9 _ _ _ _			#/IYPE		-				1		
- 245_ -51.9				Silt (ML) 243.0-245.0' - very dark gray (2.5Y 3/1), wet, stiff to very stif fine sand, no plasticity Silt (ML)	f,		-				- - - -
-	246.0			245.0-245.5' - very dark greenish gray (GLEY1 3/1), moist, very stiff, some fine sand, no to low plasticity Silty Sand (SM) 245.5-246.0' - very dark greenish gray (GLEY1 3/1), moist, moderate dense, very fine sand Clayey Silt (ML)		× ×	-	0.1*			
250 -56.9				246.0-250.6' - dark greenish gray (GLEY1 4/1), mottled with dark yellowish brown (10YR 4/6), very moist, very stiff, some very fine sand Clayey Sand (SC) 250.6 255.0' dive brown (2.5X 4/3) wet/caturated dense			R.			*Ambient PID reading up to 0.1 ppm	- - - -
- - - 255_ -61.9_				Clayey Sand (SC)				0.1*			- - - - - - - - - - - -
		19.6	SN-15	255.0-250.7 - same as above, but very dark greenish gray (GLEY1 3/1) <b>Poorly Graded Sand with Silt (SP-SM)</b> 256.7-265.0' - very dark gray (GLEY1 3/N), wet/saturated, dense to moderate dense, little clay, non-plastic			0.0	0.1*	0.0		- - - - - - - - - - - -
260 -66.9   								0.2			- - - - - - - - - - - - - - - - - - -
265_ -71.9_ _	266.0			Silty Sand (SM) 265.0-265.6' - dark greenish gray (GLEY1 4/1), moist, dense very fine-grained sand No Recovery 265.6-266.0' Bottom of Boring at 266.0 ft bgs on 12/19/16 10:40				0.2			



BORING NUMBER: WI-CV-MW02-S

SHEET 1 OF 4

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439062.9 N, 1202352.2 E)

ELEVATION: 193.2 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER	LEVELS	:		START: 12/21/16 12:50	<u>=ND</u>	1/3/	17 12	2:15		LOGG	ER : R. Clennon
DEPTH E	BELOW SU	JRFACE (	FT)	SOIL DESCRIPTION				PID			
1						00	R		55		
	INTERVA	RECOVE	RY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		OLIC L	ng Zone	ace	łole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPF	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathir	Headsp	Above F		
193.2				Cleared with vac truck/hand auger					_		
				0.0-5.0'							
_					_						N N -
-					-			NR			XX -
-					-						- 12
-					-						
					_						$\bigotimes \bigotimes$ 1
5	5.0										
188.2				Poorly Graded Sand with Gravel (SP)	-						X X -
-				medium sand, fine to coarse subround gravel	-						- 🕅 🖓
_					-						
					_						
_					_			0.0			
-					-			0.0			V V -
-				Poorly Graded Gravel with Sand (GP)	. –	•					
10				8.75-13.5° - Drown (10YR 3/3), wet, loose, fine to coarse grave	s, –	•					
183.2		8.5	SN-1	medium to coarse sand	_	-	0.0		0.0		X X -
-			-		-	. •	0.0		0.0		- 18
-					-						
-					-						
					_	<b>`</b> •					
_				N D		• ~					- 🕅 🕅
-				NO Recovery	-			0.0			- 🕅 🕅
15				15.5-10.0	-						
178.2											
_	16.0										
-				Poorly Graded Gravel with Sand (GP)	. –	•					- 12
-				medium to coarse sand	a, _	•					- X X
-					-	-					
						•					
_				18 4 20 5' dark brown (10VP 3/3) moist loose fine to	_			0.1			× × -
20 -				medium sand, fine to coarse subround gravel	-			0.1			- 12
173.2				,							
				Poorly Graded Sand (SP)							
_				20.5-23.5' - brown (10YR 3/3), very moist, loose, fine sand,	_						
-				little coarse sand and fine to coarse subround gravel	-						- XX
-					-						- 🕅 🖓
_					_						
				Poorly Graded Sand with Gravel (SP)	_			0.1			
25 -				23.5-25.0' - dark brown (10YR 3/3), moist, loose, tine to medium sand, fine to coarse subround gravel	-			U.1			- 🕺 🖓
168.2				Poorly Graded Sand (SP)							
		107	SN 0	25.0-28.65' - dark gravish brown (10YR 4/2), moist, loose.	-						
		12.7	SIN-2	fine-grained, trace silt, trace coarse round to subround gravel			0.0		0.0		
_				-	_			0.0			N N -
-					-			0.0			
-					-						
				No Recovery							
				28.65-36.0'	_						
30											



BORING NUMBER: WI-CV-MW02-S

SHEET 2 OF 4

## SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439062.9 N, 1202352.2 E)

ELEVATION: 193.2 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER LEVE	ELS :		START : 12/21/16 12:50	END	D : 1/3/17 12:15				LOGG	ER : R. Clennon
DEPTH BELOW	V SURFAC	E (FT)	SOIL DESCRIPTION					38		
INTE	RVAL (FT)	VERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMBOLIC LOG	Breathing Zone	Headspace	Above Hole	COMMENTS	WELL DIAGRAM
163.2 - - - - - - - - - - - - -	0	SN-3	Poorly Graded Sand (SP) 36.0-43.0' - dark grayish brown (10YR 4/2), moist, loose, tractorial to little silt, fine grains         Silty Sand (SM) 43.0-44.5' - olive brown (2.5Y 4/3), very moist, moderate dense, fine sand         Poorly Graded Sand with Silt (SP-SM) 44.5-49.5' - dark grayish brown (2.5Y 4/2), very moist, loose to medium dense, fine-grained         No Recovery 49.5-56.0'         Poorly Graded Sand (SP) 56.0-60.0' - very dark grayish brown (2.5Y 3/2), wet (likely frod drilling water), loose to moderate dense, fine-grained, trace silt		가 가지 않는 것 가지 않는 것 같아. 이가 가지 않는 것 같아. 가지 않는 것 같아. 가지 않는 것 <del>것 같아. 것 것 것 것 것 것 것 것 것 것 것 같아.</del> 이가가 가지 않는 것 같아. 가지 않는 것 같아. 가지 않는 것 같아. 가지 않는 것 같아. 이가 <mark>하는 것 같아. 것 같아. 가지 않는 것 같아.</mark> 것 같아. 이가 있는 것 같아. 이가 있는 것 같아. - 2011년 1월 2011년 1월 2011년 1월 2011년 1월 2011년 1월 2011년 1월 <del>2011년 1월 2011년 1월 2011년 1월 2011년 1</del> 월 2011년 1월 2	0.0	NR NR NR NR 0.3 0.1	0.0		- Bentonite - Grout



BORING NUMBER: WI-CV-MW02-S

SHEET 3 OF 4

## SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439062.9 N, 1202352.2 E)

ELEVATION: 193.2 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER LEVELS : DEPTH BELOW SURFACE (FT)				START : 12/21/16 12:50	END : 1/3/17 12:15		LOGG	ER : R. Clennon			
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		Ū,	R	PID EADIN	GS		
	INTERVA	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		BOLIC LO	ing Zone	space	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above		
133.2 - - - - - -	-			Poorly Graded Sand with Silt (SP-SM) 60.0-64.0' - very dark grayish brown (2.5Y 3/2), very moist, moderate dense, fine-grained sand							
65 128.2_ - - - - - -		15.8	SN-4	Poorly Graded Sand (SP) 64.0-71.75' - olive brown (2.5Y 4/3), moist, loose, fine-grained little silt	d, 		0.0	20	0.0		
70 123.2 - - - - - - -				<b>No Recovery</b> 71.75-76.0'	-         			16 NR			
75 118.2_	76.0			Poorly Graded Sand with Silt (SP-SM)	-			NR		Driller's Note [.] In	
80 113.2 				<ul> <li>76.0-77.5' - olive brown (2.5Y 4/3), wet (from drilling fluid), medium dense, fine-grained</li> <li>Poorly Graded Sand (SP)</li> <li>77.5-88.0' - olive brown (2.5Y 4/3), moist, loose, fine-grained, little silt</li> </ul>	- - - - - - - - - - - - - - - - - - -			0.0		76-96' sample rig pushed out some of sample (hence low recovery) - hit some dry relatively dense sand	
108.2		12.0	SN-5	No Recovery 88.0-96.0'			0.0	0.0 0.0 0.0 0.0	0.0		
90					-						-



BORING NUMBER: WI-CV-MW02-S

SHEET 4 OF 4

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439062.9 N, 1202352.2 E)

ELEVATION: 193.2 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER	LEVELS	:		START : 12/21/16 12:50	END	END : 1/3/17 12:15		LOGG	<u>ER : R. (</u>	Clennon		
DEPTH E	BELOW S	JRFACE (	FT)	SOIL DESCRIPTION		U	RE		s			
	INTERVA	al (FT) Recove	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE MINERALOGY		ABOLIC LOG	athing Zone	Idspace	/e Hole	COMMENTS	WEL	L DIAGRAM
			SAMPLE #/TYPE			SΥΝ	Brea	Hea	Abov			
103.2_ - - - - -												<ul> <li>■ Bentonite –</li> <li>Chips –</li> <li>–</li> <li>–</li> <li>–</li> <li>–</li> <li>–</li> <li>–</li> </ul>
95 98.2 _	96.0				-							
				Poorly Graded Sand with Silt (SP-SM) 96.0-116.0' - very dark greenish gray (GLEY1 3/1), very moi to wet, dense to very dense, fine to very fine sand	st _ _ _ _ _							
100 93.2 - - - - -								0.0				2"
105 88.2 		20.0	SN-6	- lenses of very dense silty sand/sandy silt in 105.0-105.25', 107.5-107.8', 108.5-108.75', sandy clay in 111.5-112.75', 114.5-116.0', low to medium plasticity, stiff			0.0	0.0	0.0			
- 110_ 83.2_ - - -						اللہ کہ کہ میں میں ایک کر میں میں کہ کہ کہ ایک ہے۔ ایک میں						
- 115_ 78.2 _	116.0				-			0.0				
				Bottom of Boring at 116.0 ft bgs on 1/3/17 12:15								- - - - -



## BORING NUMBER:

WI-CV-MW03-D

SHEET 1 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439391.3 N, 1201759.7 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Truck - Mounted - Full-sized Sonic Rig, 8" Rotary Casing with 4" x 6" Telescope Casing

WATER	R LEVELS	S:		START : 1/4/16 14:40	END	: 1/8/	17 1	6:30		LOGO	ER : R. Clennon
DEPTH	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION			P		28		
						Ö	ĸ		30		
	INTERV					<u></u>	one			COMMENTS	WELL DIAGRAM
		RECOVE	ERY (FT)	MOISTURE CONTENT RELATIVE DENSITY OR		5	z ɓu	Dace	9e	COMMENTS	
				CONSISTENCY, SOIL STRUCTURE, MINERALOGY		MB	athi	adsp	ve F		
			#/TYPE	, , ,		S	Bre	문	Abc		
193.1				Cleared with vac truck/hand auger							
				0.0-5.0'	_						
-	_				_						KI KI –
	-				-						N N -
-	-				-			NA			X X -
	-				-						- 18
-	1				-						
					_						
5_	5.0					7.77					$\bowtie$
188.1	-			Clayey Sand with Gravel (SC)	-						K K -
	-			5.0-10.5' - dark grayish brown (10YR 4/2), wet to moist,	-						- 🕅 🕅
-	-			subround gravel	-		1				X X -
	-			Subloand graver	-	///					- 13
	1				-	V///					
1 1	]				_	V///	1	0.0			
-	_				_						× × -
	_				_	////					K K -
10	-										$\otimes$ $\otimes$ -
105.1	-			Poorly Graded Sand (SP)		////	1				KA KA -
-	-			10 5-13 0' - brown (10YR 4/3) moist loose to medium dense	, –						N N -
-	1	12.5	SN-1	fine to medium-grained, trace fine to coarse subround gravel	-, _						
					_			0.0			
- I	_										
	-			Poorly Graded Sand (SP)	_						K K -
	-			13.0-14.5' - very dark grayish brown (10YR 4/2), moist, loose	<del>)</del> , _						- 🕅 🕅
15	-			Beerly Creded Sand with Crevel (SB)							KI KI -
178.1				14 5-17 9' - dark brown (10YR 3/3 to brown (10YR 3/3) mois	st —						$\otimes$ $\otimes$ $-$
				loose, fine-grained, fine to coarse subround gravel	, _						
					_						
	-				-						- 12 12
	10.0				_			0.0			- 🕅 🕅
	10.0			No Recovery		· ·					- X X
-	-			\17.9-18.0'	/-	·					- 🕅 🕅
-	1			No sample recovered due to near miss on 1/4' (see report),							
20_				sample discarded in retrieval of core barrel (per driller: felt lik	(e _						
173.1	4			dry sand, gravel in drilling)	_						N N -
- 1	4				-						X X -
-	4				-						- 🕅 🕅
	4				-						- 12 12
-	1				-						- 12
	]				-						
1	1				_						KA KA –
	-				-						- 🕅 🕅
25	4										K K –
100.1	-				-						- 🕅 🕅
	1				-						M M -
-	1				-						- 18
	1	0.0	SN-2		-		0.0		0.0		
	]				_						
-	4				_						- 🕅 🕅
	4				_						KA KA -
20 -	4				-						- 🕅 🕅
- 30											VA 1VA
	1	1									1



SHEET 2 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439391.3 N, 1201759.7 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Truck - Mounted - Full-sized Sonic Rig, 8" Rotary Casing with 4" x 6" Telescope Casing

1	WATER	LEVELS	3:		START : 1/4/16 14:40	END	: 1/8/	17 16	5:30		LOGG	ER : R. Clennon
	DEPTH E	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		(J	RI	PID EADING	GS		
		INTERVA	AL (FT)	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,			1 Zone	8	a	COMMENTS	WELL DIAGRAM
				SAMPLE #/TYPE	MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMBC	Breathing	Headspa	Above Ho		
	163.1 	36.0	7.6	SN-3	<b>Poorly Graded Sand (SP)</b> 36.0-43.6' - brown (10YR 4/3), moist, loose, fine to medium-grained, trace silt			0.0	0.0	0.0		
	- - 45_ 148.1_	46.0			No Recovery 43.6-46.0'				NR			
	   50 143.1_   		6.8	SN-4	<ul> <li>Poorly Graded Sand with Gravel (SP) 46.0-49.5' - brown (10YR 4/3, moist, loose, fine to medium-grained sand, fine to coarse, subround gravel, trace stiff</li> <li>Poorly Graded Sand (SP) 49.5-52.8' - brown (10YR 4/3) to grayish brown (10YR 5/2), moist, loose, fine-grained, trace silt, coarse subround gravel</li> <li>No Recovery</li> </ul>	- - - - - - - - - - - - - - - - - - -		0.0	NR	0.0		
	55 - 138.1_ - - - - - - - - - - - - - - - - - - -	56.0			Poorly Graded Sand (SP) 56.0-63.75' - very dark grayish brown (10YR 4/2), moist to ve moist, loose, fine to medium-grained, trace to little fine to coarse subround gravel, trace silt	- - - - - - - - - - - - - - - - - - -			NR 0.0			



SHEET 3 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439391.3 N, 1201759.7 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Truck - Mounted - Full-sized Sonic Rig, 8" Rotary Casing with 4" x 6" Telescope Casing

WATER	LEVELS	:		START : 1/4/16 14:40	END	<u>: 1/8/</u>	17 1	5:30		LOGG	ER : R. Clennon
DEPTH E	BELOW SI	JRFACE (	FT)	SOIL DESCRIPTION			D		28		
1						Ö			33		
	INTERVA	AL (FI)				Ū	one			COMMENTS	WELL DIAGRAM
		RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		ğ	ng Z	pace	우		
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		Ř	eath	eads	ove		
			#/TYPE			Ś	ä	Ť	ΦÞ		
133.1_					_						
_					_						
-					-						$\boxtimes$
-					-						
_					-						
					_						
_				Poorly Graded Sand with Silt (SP-SM)	_	TT					
65 -				63.75-69.75' - dark grayish brown (2.5Y 4/2), moist, medium	-	나는		0.0			- 13
128.1				dense to loose, fine-grained, trace coarse subround gravel							
		157	SN E		-	i li					
		15.7	5-715		_	티란	0.0		0.0		
_					_	111					
-					-	민님					$\bowtie$
-					_	담감					
_					-	同時					
					_						
122 1				Silty Sand (SM)							$\otimes$ $\otimes$ $-$
123.1				69.75-71.5' - olive brown (2.5Y 4/3), moist, dense, fine-graine	ed –			0.0			
-					-						
_				Poorly Graded Sand with Silt (SP-SM)	Γ						
				71.5-71.7' - olive brown (2.5Y 4/3), moist, medium dense,	/_						
_				\fine-grained, trace coarse subround gravel							
-				No Recovery	-						$\bigotimes \bigotimes$ –
-				71.7-70.0	-	·		NR			
75					-						
118.1					_	1					
_	76.0					TEP 1					
_				76 0.88.8' olive brown (2.5V 4/3) wet to moist (likely due to	-	답답				No PID readings	- 12 12
-				drilling fluid), medium dense to loose, fine-grained	_	11 I				malfunctioned	
-					-	日日					
					_	Li i					
_					_						
80 -					-	티는					
113.1						i li					$\otimes \otimes \neg$
					_						
					_	l H					
-					_	1   F					
-					-	Li.					
-					_	出出					
					_	민문					
					_						N N -
85						南南					
100.1					-	日日					$\bowtie$
-		12.8	SN-6		-	日片	1				
-					-	自由					
					_	日母					
-					-	出出	1				$\bowtie$
-											$\bowtie$
-				No Recovery	-						
90				88.8-96.0'							



SHEET 4 OF 9

## SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439391.3 N, 1201759.7 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Truck - Mounted - Full-sized Sonic Rig, 8" Rotary Casing with 4" x 6" Telescope Casing

WATE				START : 1/4/16 14:40	END	: 1/8/	/17 1	<u> 3:30</u>		LOGG	ER : R. Clennon
DEPT	HBELOW S	SURFACE (	(FT)	SOIL DESCRIPTION		(1)	R		66		
1						ŏ					
1				SOIL NAME USCS GROUP SYMBOL COLOR		<u>0</u>	Zone			COMMENTS	WELL DIAGRAM
		RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		ğ	ing 2	space	비어	COMMENTO	
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		Ϋ́	eath	eads	ove		
			#/TYPE			Ś	B	Т	Ab		
103.1	1				-						- 🕅 🕅
	-				-						XX -
	-				-						- 🕅 🕅
					_						
	_				_						
	_				-						- 🕅 🕅
	-				-						K K -
95	-				-						- 12 12
98.1	_				_						
	96.0					C. P.L					N N -
	_			Poorly Graded Sand with Silt (SP-SM)	-	답답					X X -
	-			drilling fluid) medium dense to loose fine-grained	-	[i¦i					× × ·
	-				-	티문					
	]				_	日片					
	_				-	ЦĿ					XX -
100	-				-	ļ,	ż				- 🕅 🕅
93.1	-			Sandy Clay (CL)		///				Driller's Note:	
	-			99.7-102.7 - grayish brown (2.5Y 5/2), moist, stiff, fine-grain sand, low to medium plasticity	ea -					Lost about 4-5' of	
				sand, low to medium plasticity	_	///	1			sample a foot of	
	_				-		1			bottom of core	K K -
	-				-		4			sand)	- 12 12
	-			Poorly Graded Sand with Silt (SP-SM)	-					(No PID	
	]			(2.5Y 4/3) moist loose fine-grained few clay stringers (<0.1	- ני	Li li				samples/pass	
					/ _	날날				100-116' - PID	
105	_					답답				unit battery died	
00.1	-				-	li li					- 12 12
	-	10.6	SN-7		-	티는					- 12
				No Recovery		1.1.1					
	_			106.6-116.0'	-						- 🕅 🕅
	-				-						- 🕅 🕅
	-				-	·					Bentonite -
	-				-						Grout -
110	_										
83.1	_				-						N N -
	-				-						XX -
1	-				-						- 12 12
1	1				-						M M -
1					_						
1	_				-						× × -
1	-				-						- 🕅 🕅
115	-				-						- 🕅 🕅
78.1						1					$\otimes \boxtimes$ –
1	116.0										
1	-			Silty Sand (SM)	. –					Driller's Note:	K K -
1	-			fine-grained few clay stringers	<del>,</del> _					126' sample fall	- 🕅 🕅
1	-			inte grantea, tew day sungels	-					out, not	KA KA -
1	]				_			0.0		recovered in core	N N -
1	_	94	SN-8		_	[				barrel	X X -
100	-		0.10		-						- 12 12
120	_								-		
1											



## BORING NUMBER:

WI-CV-MW03-D SHEET 5 OF 9

## SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439391.3 N, 1201759.7 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Truck - Mounted - Full-sized Sonic Rig, 8" Rotary Casing with 4" x 6" Telescope Casing

WATE	ER LEVEL	S :		START : 1/4/16 14:40	END : 1/8/17 16:30				LOGG	ER : R. Clennon	
DEPT	H BELOW	SURFACE	(FT)	SOIL DESCRIPTION		. ഗ	R	PID EADING	GS		
	INTER'	/AL (FT)				IC LC	one.			COMMENTS	WELL DIAGRAM
		RECOV	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR	,	1BOL	thing Z	dspace	e Hole	COMMENTS	
			SAMPLE #/TYPE	CONSISTENCT, SOIL STRUCTURE, MINERALOGT		SYN	Brea	Hear	Abov		
73.1	_			Silt (ML)	_						- 18
				120.4'-120.8 - olive brown (2.5Y 4/3), moist, stiff				0.0			
	122.0			Poorly Graded Sand (SP) 120.8-122.0' - olive brown (2.5Y 4/3), moist to very moist,	Γ	111					- 🕅 🕅
	-			medium dense, fine-grained little silt (decrease with depth),	/-						
	-			(generalized description) Silty Clayey Sand (SC/SM)							
125	-			122.0-142.0' - dark grayish brown (10YR 4/2) to very dar (GLEY 1 4/1), wet, moderate dense, low plasticity	'k gray						- X
68.1	-				-						
	-				_						
	_				_						
	-				-						- 18
	-				_						
130					_						
63.1	-				-					Driller's Note: 122-142',	- 1
	-				_			0.0		sample all fell	- 12
	_	6.0	SN-9		_					with auger bit	
	-				_					attempt to suck it	
	-				_					out/rewire using flapper bit, o 3rd	
135										attempt, retrieve	
58.	-				-					~o messy/saturated	
	_				-					recovery	- 🕅 🕅
	-				_						
	_				_						
	-				-						- 🕅
140 53 1					_						
00.	'				_						
	142.0				-						
	-			Silty Sand (SM) 142.0-148.5' - dark gravish brown (10YR 4/2), moist to wet	-						- 18
	-	1		(likely from drilling mud) medium dense, fine-grained	_						
	-				_			0.0			
145 48.1											
	-				_						
	-				_						
	_				-						- 12
	-			Poorly Graded Sand with Silt (SP-SM)							
450	-	1		148.5-151.5' - very dark gray (10YR 3/1), moist, medium	-	臣		0.0			
150				uense, ime-grameu							



## BORING NUMBER:

WI-CV-MW03-D

SHEET 6 OF 9

## SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439391.3 N, 1201759.7 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Truck - Mounted - Full-sized Sonic Rig, 8" Rotary Casing with 4" x 6" Telescope Casing

WATE	<u> LEVELS</u>	<u> 5 :</u>		START : 1/4/16 14:40	END	<u>: 1/8</u> /	17 1	<u>6:30</u>		LOGG	ER : R. Clennon
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION				PID	~~		
1						8	R		65		
1	INTERV	α∟ (FI)				U U	one				WELL DIAGRAM
		RECOVE	ERY (FT)	SOIL NAME, USUS GROUP STMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		5	Z BL	Dace	lole	COMMENTS	
				CONSISTENCY, SOIL STRUCTURE, MINERALOGY		MB	athi	adsp	ve F		
			#/TYPE			₹	Bre	운	Abc		
43.1						다는					
					_	다는					
	_	19.0	SN-10	Silty Sand (SM)	_						N N -
				151.5-159.75 - dark gray (10YR 3/1) to very dark greenish	-		0.0		0.0		XX -
	-			(GLETT 5/T), moist, medium dense, ime-gramed	-						⋈ ⋈ -
					-			0.0			
					_						
155					_						
38.1					_						
	_				-						- 12 12
					-						
					-						
					-						
					_			0.0			$\bigotimes$
	_				_						X X -
160	-				_						⊠ ⊠ -
33.1				Silt (ML)							
				159.75-161.0' - very dark greenish gray (GLEY1 3/1) to	_						
				No Bocovery							
	162.0			$\sim$ 161 0-162 0'	_	TTT					K K -
· ·	-			Silty Sand (SM)							99 -
				162.0-166.5' - dark greenish gray (GLEY1 4/1), moist,	-			0.0			
				fine-grained sand (potentially slough?)	-						
					_						
165											$\otimes \otimes$ -
20.1	-				-						XX -
· ·					-						
· ·				Silt (ML)							
				166.5-168.25' - dark greenish gray (GLEY1 4/1), moist, stiff							
· ·				low plasticity	_						- 12 12
	-			Silty Sand (SM)	-			0.0			K K -
	-	17.7	SN-11	168.75-169.75' - dark greenish gray (GLEY1 4/1), moist,	-		. 0.0		0.0		- 12 12
170				tine-grained sand (potentially slough?)							
23.1				Interbedded Silty Sand (SM) and Silt (ML)							
· ·				fine-grained sand (notentially slough?)	_						
·	-				_						
1 ·	1				-						
1	1				-						
1								Ι.			
<b>·</b>	4			Poorly Graded Sand with Silt (SP-SM)		臣臣		0.0			$\bowtie$
175	-			1/3.5-1/4.5 - greenish black (GLEY1 2.5/1), moist, modera	ιte	H	1				$\bowtie$
18.1	1			Poorly Graded Sand with Silt (SP-SM)	/						
1	176.0			174.5-176.0' - greenish black (GLEY1 2.5/1). moist. modera	te –						
1				\dense to loose, fine to medium sand, few clay stringers	· /_		1			Due to clay	
· ·	-			Clayey Silt (ML)						material, use of	N N -
·	-			176.0-188.0' - very dark greenish gray (GLEY 1 3/1), moist	-					auger bit, sample	
1 ·	1			very stiff, low plasticity	-						
1	1				-						
1					_						
180											$\bowtie$
1											
1	1						I	I I			



SHEET 7 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439391.3 N, 1201759.7 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Truck - Mounted - Full-sized Sonic Rig, 8" Rotary Casing with 4" x 6" Telescope Casing

WATER	LEVELS	:		START : 1/4/16 14:40	END	ND : 1/8/17 16:30			LOGG	ER : R. Clennon	
DEPTH E	BELOW SI	JRFACE (	FT)	SOIL DESCRIPTION		J	R	PID ADING	s		
	INTERVA	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		BOLIC LO	ning Zone	space	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMI	Breath	Head	Above		
13.1 _ _ _ _ _ _ _		23.3	SN-12				0.0	0.1	0.0		
185 8.1 	188 0				-			0.0			
	100.0			Sandy Clay (CL) 188.0-193.0' - very dark greenish gray (GLEY1 3/1), very moist, stiff, fine-grained sand, low plasticity				0.1			
- - - - - 1.9 - - - - - - - - - - - - - - - - - - -		23.0	SN-13	Silty Clay (CL) 193.0-202.0' - dark greenish gray (GLEY1 4/1), moist to very moist, stiff, low to medium plasticity			0.0	0.2	0.0		
_ 200_ -6.9 _ _								0.2			
- - 205_ -11.9_	206.0			Silty Clay (CL) 202.0-206.0' - dark greenish gray (GLEY1 4/1), damp/dry to moist, stiff, low to medium plasticity	-			0.2			
210				Silty Clay (CL) 206.0-216.0' - dark greenish gray (GLEY1 4/1), very moist, s to medium stiff, moderate plasticity, some fine sand in 213.0-216.0'	tiff			0.0			



SHEET 8 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439391.3 N, 1201759.7 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Truck - Mounted - Full-sized Sonic Rig, 8" Rotary Casing with 4" x 6" Telescope Casing

WATE	R LEVELS	S :		START : 1/4/16 14:40	END : 1/8/17 16:30				LOGG	ER : R. Clennon	
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		U	R	PID EADING	GS		
	INTERVA	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		OLIC LO	ng Zone	Jace	lole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathir	Headsp	Above H		
-16.9	-	16.5	SN-14				0.0	0.1	0.0		
-21.9 220 -26.9	216.0			Clayey Sand (SP-SC) 216.0-222.0' - very dark greenish gray (GLEY1 3/1), very moist/wet,medium dense, fine-grained, non plastic				0.2			Bentonite - Chips -
225 -31.9		16.4	SN-15	Poorly Graded Sand with Clay (SP-SC) 222.0-229.5' - very dark greenish gray (GLEY1 3/1), wet/ver moist, moderate dense, fine-grained	y                                                         		0.0	0.2	0.0		20/40 Sand
230_ -36.9				Poorly Graded Sand with Clay/Silt (SP/SC) 229.5-232.4' - wet, loose, fine to medium-grained No Recovery 232.4-236.0'	- 	1 1 1 1 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7		NR			
235 -41.9	236.0			Poorly Sorted Sand with Clay (SP/SC) 236.0-238.0' - greenish black (GLEY1 2.5/1), wet, moderate dense to loose, fine-grained, trace gravel Poorly Graded Sand (SP) 238.0-238.6' - dark greenish gray (10YR 4/1), wet, loose, medium-grained, little clay				0.0			



SHEET 9 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439391.3 N, 1201759.7 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Truck - Mounted - Full-sized Sonic Rig, 8" Rotary Casing with 4" x 6" Telescope Casing

WATER	LEVELS	:		START : 1/4/16 14:40	END	: 1/8/	17 1	6:30		LOGG	ER : R. Clennon
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		(1)	R		35		
	INTERVA	AL (FT)				ŏ					
		RECOVE	RY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR	,	BOLIC	thing Zone	Ispace	e Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPF	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYN	Breat	Head	Above		
-46.9_		110.0	SN-16	Sandy Clay (CL) 238.6-239.6' - very dark gray (GLEY1 3/1 to dark greenish g	gray / _						
-		110.0	011-10	(5G 4/1), wet/very moist, stiff, low plasticity Clayey Sand (SC) 239.6-241.0'- dark greenish gray GLEY1 4/1), moist, dense	/		0.0		0.0		-
-				fine-grained sand, trace fine gravel Sandy Silt (ML)	,			0.0			-
245				241.0-246.0' - dark grayish brown (10YR 3/2), damp to dry friable/crumbly stiff	, - _						-
-51.9	246.0				-						-
-				Silt (ML) 246.0-250.0' - very dark grayish brown (10YR 3/2), damp to dry, very stiff, little fine sand	-						-
-					-			0.0			-
250 -56 9	-			Sandy Silt (MI)							
-	•	11.7	SN-17	250.0-252.5' - dark greenish green (GLEY1 4/1), damp to moist, very stiff, no to low plasticity	-		0.0		0.0		-
-	-			Poorly Sorted Sand with Silt (SP-SM/SP-SC)				0.0			-
-				252.5-256.0' - very dark greenish gray (GLEY1 3/1), wet, dense, fine to medium-grained, non plastic	-						-
255 -61.9											-
-	256.0			Bottom of Boring at 256.0 ft bgs on 1/8/17 16:30							-
					-						-
					-						-
					-						-
					-						-
					-						-
					-						-
					-						-
					-						-

# ch2m

#### PROJECT NUMBER: 679580.FI.WI

BORING NUMBER: WI-CV-MW03-M SHEET 1 OF 6

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439397.6 N, 1201756.8 E)

SOIL BORING LOG

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER LEVELS :				START: 1/10/17 15:30 E	:ND :					LOGG	ER : R. Clennon
DEPTH E	BELOW SI	JRFACE (	FT)	SOIL DESCRIPTION				PID			
l I		(	,			00	R	EADING	SS		
	INTERVA	RECOVE	RY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		BOLIC L	ning Zone	space	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		Μ	sreat	lead	bove		
400.4			#/TYPE			S	-	-	A		
193.1				Cleared with vac truck/air knife	-						X X -
_				0.0-5.0	-						- 12 12
-					-						K K -
-					-						- 12
-					-						
_					-			N/A			
					_						
					_						
5	5.0										
188.1	6.0	2.7	SN-1	Poorly Graded Sand and Gravel (SP)	_		0.0		0.0		K K -
-	6.0			5.0-6.7 - dark yellowish brown (101R 4/4), wet, loose, medium	י ו		0.0	0.0	0.0		- 12 12
-				sailu, ille to coalse subroulu gravei	_			0.0			
-				Poorly Graded Sand (SP)	-						- 18
-				6.7-10.5' - brown (10YR 4/3), wet, loose, fine to	-						
_				medium-grained, illie line to coarse subround graver	_			0.0			
					_						
10											$\otimes$ $\otimes$ $-$
183.1				Pearly Creded Cand and Crevel (CP. CP.)							X X -
-		6.9	SN-2	10.5.12.0' brown (10VP 5/3) damn to dry loose	-		0.0	0.0	0.0		- 18
-				fine-grained little coarse sand fine to coarse subround to	-		0.0	0.0	0.0		
-				subangular gravel	-						
_					-						
				No Recovery	_						
				12.9-16.0'	_						
					_						
15											$\otimes \otimes -$
178.1	16.0				-			INR			XX -
-	10.0			Poorly Graded Sand (SP)							× × -
-				16.0-19.6' - brown (10YR 4/3), moist, loose, fine-grained, little	-						
-				fine to coarse subround gravel	_						
				-	_			0.0			
_					_						
_					_						N N -
20 -					_						XX -
173 1				Moderate Graded Gravel with Sand (GW)							$\otimes \otimes$ -
				19.0-21.3 - DIOWI (10 TR 4/3), MOISI, 100SE, IIIIE IO COALSE	-	• • •					
-		5.3	SN-3		-	• •	0.0		0.0		
				No Recovery	_						
_				21.3-20.0	_						
_					_						N N -
_					-						XX -
					-			1111			$\bowtie$
25					-						
168.1											
-	26.0				_						
				Well Graded Gravel with Sand (GW)							
				26.0-29.5' - grayish brown (10YR 4/2), moist to wet, loose, little	÷ _						
_				clay	_	• • •					
_					_	• •					$\bowtie$
-					-						$\bowtie$
					-	• •					
30											



#### PROJECT NUMBER: 679580.FI.WI

BORING NUMBER: WI-CV-MW03-M SHEET 2 OF 6

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439397.6 N, 1201756.8 E)

SOIL BORING LOG

#### ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

WATEF	R LEVELS	3 :		START : 1/10/17 15:30 E	ND	ND :				LOGO	ER : R. Clennon
DEPTH	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		U	R	PID EADIN	GS		
	INTERV	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT. RELATIVE DENSITY OR		опс го	ing Zone	pace	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPF	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above		
163.1 - - -	-	7.3	SN-4	Poorly Graded Sand with Gravel (SP) 29.5-33.3' - dark grayish brown (10YR 4/2), moist to wet, loose fine to medium-grained, fine to coarse subangular to subround gravel, trace to little silt			0.0	0.1	0.0		
35_ ⁻ 158.1 __	36.0			No Recovery 33.3-36.0'				NR			
40				Poorly Graded Sand with Silt (SP-SM) 36.0-43.1' - brown (10YR 4/3), moist, loose, fine-grained, trace fine to coarse subangular gravel				0.0			
153.1 - - - -	-	7.1	SN-5	No Decourse			0.0	0.0	0.0		
45 148.1_	46.0			43.1-46.0'				NR			
50 143.1			SN-6	<b>Poorly Graded Sand with Silt (SP-SM)</b> 48.0-53.0' - olive brown (2.5Y 4/3) to brown (10YR 4/3), moist, loose, fine-grained, trace fine to coarse subround gravel			0.0	0.0	0.0		
55_ 138.1	56.0			<b>No Recovery</b> 53.0-56.0'				NR			
- - - - - - - - - - - - - - - - 				Poorly Graded Sand with Silt (SP-SM) 56.0-58.5' - olive brown (2.5Y 4/3) to brown (10YR 4/3), moist, loose, fine-grained, trace fine to coarse subround gravel				0.0			

# ch2m

PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : Coupeville, WA (439397.6 N, 1201756.8 E)

SOIL BORING LOG

#### ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Sonic Drilling - Full-sized Truck - Mounted Sonic, 4" x 6"

PROJECT NUMBER:

679580.FI.WI

WAT	ER LEV	VELS	:		START : 1/10/17 15:30	END	ND :			LOGG	ER : R. Clennon	
DEP	TH BELC	OW SL	JRFACE (	FT)	SOIL DESCRIPTION		Ū	R	PID EADIN	GS		
	INT	ERVA r	L (FT)				IC LC	Zone			COMMENTS	WELL DIAGRAM
			RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		1BOL	thing 2	dspace	e Hole		-
				SAMPLE #/TYPE	CONSISTENCE, SOIL STRUCTURE, MINERALOGT		SYN	Brea	Hea	Abov		
133	.1_ - - - - -		8.7	SN-7	Poorly Graded Sand (SP) 58.5-64.7' - dark grayish brown (10YR 4/2), very moist, loose, fine to medium-grained, trace to little silt, trace fine to coarse subround gravel			0.0	0.0	0.0		
65 128	.166	6.0			No Recovery 64.7-66.0'			-				
70		0.0			Poorly Graded Sand with Silt (SP-SM) 66.0-70.0' - olive brown (2.5Y 4/3), moist, loose to medium dense, very fine-grained sand, trace clayey silt lenses	-			NR 0.0			- Bentonite -
75	.1		9.9	SN-8	Poorly Graded Sand with Silt (SP-SM) 70.0-75.9' - brown/olive brown (2.5Y 4/3), moist, loose to medium dense, very fine to fine-grained			0.0	0.0	0.0		
80 113 85 108	.'76	6.0	8.7	SN-9	No Recovery         75.9-76.0'         Sandy Silt (ML)         76.0-76.5' - olive brown (2.5Y 4/3), wet (likely from drilling fluidense, nonplastic         Poorly Graded Sand with Silt (SP-SM)         76.5-84.7' -brown/olive brown (2.5Y 4/3), moist, loose to medium dense, very fine to fine-grained         No Recovery         84.7-86.0'         Poorly Graded Sand with Silt (SP-SM)         86.0-93.6' - brown/olive brown (2.5Y 4/3), moist, loose to medium dense, very fine to fine-grained			0.0	0.0 0.0 NR	0.0		
90	-					-			0.0			



BORING NUMBER:

WI-CV-MW03-M SHEET 3 OF 6

# ch2m

#### PROJECT NUMBER: 679580.FI.WI

BORING NUMBER: WI-CV-MW03-M SHEET 4 OF 6

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439397.6 N, 1201756.8 E)

SOIL BORING LOG

#### ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

WATEF	R LEVELS	8 :		START : 1/10/17 15:30	END	D:			LOGO	ER : R. Clennon	
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		0	R	PID EADIN	GS		
	INTERV/	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		OLIC LC	ng Zone	pace	lole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above I		
103.1 - - - -	-	7.6	SN-10		-		0.0	0.0	0.0		
95_ 98.1_	96.0			No Recovery 93.6-96.0'	-	tr ta	-	NR			
-	-			Poorly Graded Sand with Silf (SP-SM) 96.0-98.0' - brown/olive brown (2.5Y 4/3), moist, loose to medium dense, very fine to fine-grained Clay with Silt, Fine Sand (CL) 98.0-99.3' - brown (2.5Y 4/3), moist, stiff, moderate plasticity	-						
100 93.1 -	-	10.5	SN-11	Clayey Sand (SC) 99.3-100.8' - olive brown (2.5Y 4/3), moist, dense/stiff, nonplastic Silty Clay (CL) 100.8-102.8' - olive brown (2.5Y 4/3), very stiff, moderate plasticity			0.0		0.0		
105 88.1	106.0			<ul> <li>Sandy Clay (CL)</li> <li>102.8-103.1' - olive brown (2.5Y 4/3) dense, very stiff, low to moderate plasticity, trace fine subround gravel</li> <li>Poorly Graded Sand (SP)</li> <li>103.1-106.0 - light olive brown (2.5Y 5/3), moist, loose, fine-grained, little silt</li> </ul>				0.0			
- - - - - - - - - -	-			Poorly Graded Sand with Silt (SP-SM) 106.0-110.5' - olive brown (2.5Y 4/3), very moist to wet, loose to moderate dense, fine-grained, little clay	;		•	0.0			
83.1 		7.8	SN-12	Silty Sand (SM) 110.5-111.3' - olive brown (2.5Y 4/3), very moist to wet, loose to moderate dense, fine-grained, little clay Poorly Graded Sand (SP) 111.3-113.6' - light olive brown (2.5Y 5/3), moist, loose, fine-grained, trace to little silt, few dense silt stringers from 111.3-112.0'			0.0	0.0	0.0		
115 78.1	116.0			No Recovery 113.6-116.0'		177.	ł				
- - - - - -	-			116.0-117.0' - dark grayish brown (2.5Y 4/2), wet (likely from drilling fluid), moderate dense, fine-grained sand, no to low plasticity, trace fine to coarse subrounded gravel Sandy Clay (CL) 117.0-119.9' - dark grayish brown (2.5Y 4/2), moist, soft, fine sand, low plasticity trace fine to course subround to subangula grained	  ar			0.4			
120				<u>yrantu</u>							<u>УЛ ЦУЛ</u>

# ch2m.

#### PROJECT NUMBER: 679580.FI.WI

BORING NUMBER: WI-CV-MW03-M

SHEET 5 OF 6

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439397.6 N, 1201756.8 E)

ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

WA	TER	LEVELS	5 :		START : 1/10/17 15:30 END :				LOGG	ER : R. Clennon		
DEF	PTH B	ELOW S	URFACE (	(FT)	SOIL DESCRIPTION		U	R	PID EADIN	GS		
		INTERV/	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		SOLIC LO	ing Zone	pace	Hole	COMMENTS	WELL DIAGRAM
				SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above I		
73	3.1 _ - - - - - - - - - - - - - - -		6.6	SN-13	Clayey Sand (SC) 119.9-120.3' - dark grayish brown (2.5Y 4/2), wet (likely from drilling fluid), moderate dense, fine-grained sand, no to low plasticity, trace fine to coarse subrounded gravel Poorly Graded Sand (SP) 120.3-122.6 - light brownish gray (10YR 6/2), damp, loose, t to very fine-grained,little silt, trace fine to coarse subangular gravel No Recovery	fine		0.0	4.5	0.0		
68	3.1				122.6-126.0'				NR			
13 63 13 58	30 	126.0	9.5	SN-14	Poorly Graded Sand with Silt (SP-SM) 126.0-135.5' - olive grayish brown (2.5Y 4/2), moist, modera dense, fine to very fine-grained	ate		0.0	0.2	0.0		
14 53	40 3.1		7.2	SN-15	135.5-136.0' Poorly Graded Sand (SP) 136.0-143.2' - very dark grayish brown (10YR 3/2), moist to very moist, loose, fine-grained, little silt No Recovery			0.0	NA*	0.0		- Bentonite - Chips -
14 48	45_ 3.1_	146 0			143.2-146.0'	-					*PID battery discharged/deple due to cold	ed
15	- - - 50	170.0			Poorly Graded Sand with Silt (SP-SM) 148.5-151.5' - very dark gray (10YR 3/1), moist, medium dense, fine-grained							


### PROJECT NUMBER: 679580.FI.WI

BORING NUMBER: WI-CV-MW03-M SHEET 6 OF 6

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439397.6 N, 1201756.8 E)

#### ELEVATION: 193.1 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Sonic Drilling - Full-sized Truck - Mounted Sonic, 4" x 6"

OPEPTHEELOW SURFACE (P)         SOIL DESCRIPTION         g         mcmma         comments         Well Dia           1000         RECOVERY (P)         SOIL NAME: USCS GROUP SYNEDL COLOR. CONSISTENCY. SOIL STRUCTURE, MINERALOGY         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g         g <td< th=""><th>WATER LEVELS :</th><th>START : 1/10/17 15:30</th><th>END</th><th></th><th>_</th><th></th><th></th><th>LOGG</th><th>ER : R. Clennon</th></td<>	WATER LEVELS :	START : 1/10/17 15:30	END		_			LOGG	ER : R. Clennon
43.1     Soli: NAME: USCS GROUP SYMBOL. COLOR, MOISTURE: CONTENT, RELATIVE DENSITY OR SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SAME: SA	DEPTH BELOW SURFACE (FT)	SOIL DESCRIPTION		ц	R	PID EADING	GS		
Sill (ML)         Sill (String Card (SM)           135.1         SN-16           135.1         SN-16           Sill (SL)         Sill (SL)           135.1         SN-16           Sill (SL)         Sill (SL)           136.0         Sill (SL)           156.0         Sill (ML)           156.0         Sill (ML)           166.0         Sill (SL)           166.0         Bottom of Boring at 166.0 ft bgs on	INTERVAL (FT) RECOVERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT. RELATIVE DENSITY OR		SOLIC LC	ing Zone	pace	Hole	COMMENTS	WELL DIAGRAM
43.1         SN-16         Sity Sand (SM) 131.5-150.72 - dark grav (10YR 3/1) to very dark greenish (GLEY1 3/1),most, medium dense, fine-grained           155         Iss.0         Sitt (ML) 159.75-151.02 - very dark greenish grav (GLEY1 3/1) to greenish back (2.5Y 4/1), damp to most, stiff           160         SN-17         Sitt (ML) 159.75-151.02 - very dark greenish grav (GLEY1 3/1) to greenish back (2.5Y 4/1), damp to most, stiff           165         SN-17         No Recovery 161.0-162 - dark greenish grav (GLEY1 4/1), moist, fine-grained sand (potentially slouph?)           165         Bottom of Boring at 166.0 ft bgs on         Bottom of Boring at 166.0 ft bgs on	SAMPL #/TYP	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above		
33.1       156.0         160       Silt (ML)         159.75-161.0" - very dark greenish gray (GLEY1 3/1) to greenish black (2.5V 4/1), damp to moist, stiff No Recovery         161.01-62.0         Silty Sand (SM)         165.0         Bottom of Boring at 166.0 ft bgs on	43.1 SN-16	Silty Sand (SM) 151.5-159.75' - dark gray (10YR 3/1) to very dark greenish (GLEY1 3/1),moist, medium dense, fine-grained							Schedule 80 - 0.010 Slot Screen
165     SN-17     SN-17 <t< td=""><td>38.1 <u>156.0</u> <u>160</u> 33.1</td><td>Silt (ML)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	38.1 <u>156.0</u> <u>160</u> 33.1	Silt (ML)							
Bottom of Boring at 166.0 ft bgs on	SN-17	159.75-161.0' - very dark greenish gray (GLEY1 3/1) to greenish black (2.5Y 4/1), damp to moist, stiff No Recovery 161.0-162.0' Silty Sand (SM) 162.0-166.5' - dark greenish gray (GLEY1 4/1), moist, fine-grained sand (potentially slough?)							
		Bottom of Boring at 166.0 ft bgs on	- - - - - - - - - - - - - - - - - - -						



WI-CV-MW04-M SHEET 1 OF 7

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (440483.0 N, 1201341.6 E)

ELEVATION: 193.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Rotary Sonic, PS 600 Sonic Rig, 8" Casing x 7" Core Barrel

WA	FER L	EVELS	:		START : 1/24/17 10:45 END : 1/27/17 16:00				)	LOGG	ER : D.LuBell	
DEF	TH BE	ELOW SI	URFACE (	FT)	SOIL DESCRIPTION		(J	F	PID EADIN	GS		
	I	INTERVA	AL (FT)				Ĭ	e	$\mathbf{r}$			
			RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		BOLIC	hing Zor	Ispace	e Hole	COMMENTS	WELL DIAGRAM
				SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYM	Breat	Head	Above		
193	3.2_ - - - - - - - - - - - - - - - - - - -	0.0	5.0	SN-1	Silty Sand (SM) 0.0-1.1' - black (7.5YR 2.5/1), moist, loose, fine-grained sand Silt (ML) 1.1-2.7' - brown, dry to moist, stiff, trace to little clay Well Graded Sand with Gravel (SW) 2.7-5.0' - brown (7.5YR 5/2), moist, loose, fine to coarse-grained sand, fine to coarse gravel subrounded to rounded, trace silt, trace cobbles up to 4"							
188	3.2				<ul> <li>Well Graded Gravel with Sand &amp; Silt (GW)</li> <li>5.0-7.3' - brown (7.5YR 5/2), moist, loose, fine to coarse grav subrounded to rounded, fine to coarse-grained sand, silt, trac clay</li> <li>Well Graded Sand with Gravel and Silt (GW)</li> <li>7.3-10.0' - brown (7.5YR 5/2), moist, loose, fine to coarse-grained sand, fine to coarse gravel, rounded silt, clay</li> </ul>	el, ;e 	• • • • • • • •		0.1			
11	0 3.2_ - - - - - - - - - - - - - - - - - - -	15.0	10.0	SN-2	Well Graded Gravel with Sand & Silt (GW/GM) 10.0-15.0' - dark grayish brown (10YR 4/2), moist, loose, fine coarse gravel, rounded, fine to coarse-grained sand, 20-30% cobbles	e to 			0.1			
2 175	5 3.2 - - - - - 3.2 - - - - - - - - - - - - - - - - - - -	15.0	10.0	SN-3	<ul> <li>Well Graded Gravel with Sand &amp; Silt (GW/GM) 15.0-17.4' - dark grayish brown (10YR 4/2), moist, loose, fine coarse gravel, rounded, fine to coarse-grained sand, 20-30% cobbles</li> <li>Clay with Sand and Gravel (CL) 17.4-16.6' - dark brown (7.5YR 3/2), moist, stiff, fine to medium-grained sand, fine rounded gravel</li> <li>Well Graded Gravel with Sand (SW) and Silt 17.6-18.9' - dark grayish brown (10YR 4/2), moist to wet, loos fine to coarse gravel, rounded &lt;2", fine to coarse-grained sar silt</li> <li>Well Graded Sand with Gravel (SW) 18.9-23.9' - dark grayish brown (10YR 4/2), moist to wet, loos fine to coarse-grained sand, fine gravel, rounded, trace silt</li> <li>Well Graded Sand (SW)</li> </ul>	e to			0.1			
2 168 3	5 3.2    0	25.0			23.9-24.5' - brown (10YR 4/2), fine to coarse-grained sand, moist loose, trace fine gravel <b>Poorly Graded Sand (SP)</b> 24.4-25.0' - grayish brown (10YR 5/2), dry, loose, fine-graine sand <b>Gravel with Sand and Silt (GW-GM)</b> 25.0-27.7' - dark gray (5YR 4/1), moist, loose to medium dense, fine rounded gravel, trace silt <b>Well Graded Sand with Gravel (SW)</b> 27.7-30.0' - dark gray (5YR 4/1), moist, loose to medium dense, fine-grained gravel, trace silt	d			0.1			



WI-CV-MW04-M SHEET 2 OF 7

BORING NUMBER:

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (440483.0 N, 1201341.6 E)

ELEVATION: 193.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Rotary Sonic, PS 600 Sonic Rig, 8" Casing x 7" Core Barrel

WAIER	<u>R LEVELS</u>	5:		START : 1/24/17 10:45	END	: 1/2	7/17	16:00	)	LOGG	ER : D.LuBell
DEPTH	DEPTH BELOW SURFACE (FT)			SOIL DESCRIPTION		PID READINGS			~~		
1		(				8	R		US .		
	INTERV	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		BOLIC L(	ning Zone	space	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMI	Breath	Head	Above		
163.2		10.0	SN-4	Well Graded Sand with Gravel (SW)				0.0	`		
-	- - - -			30.0-33.5' - very dark gray (2.5Y 3/1), moist, loose, fine to coarse-grained sand, fine gravel, rounded	-	-					
35_ 158.2_	35.0			<b>Poorly Graded Sand (SP)</b> 33.5-37.0' - dark grayish brown (2.5Y 3/2), moist, loose, fine medium-grained, some few fine rounded gravels (5-15%)	to			0.1			
	-			Silty Sand (SM) 37.0-39.5' - dark grayish brown (10YR 4/2), moist, loose, fine-grained, some medium cemented sand	-						
40 153.2 - - - - -		10.0	SN-5	Poorly Graded Sand with Gravel (SW) 39.5-40.0' - dark grayish brown (10YR 4/2), moist, loose, fine-grained sand, fine rounded gravel Poorly Graded Sand (SP) 40.0-45.0' - dark grayish brown (10YR 4/2), dry to moist, loo fine-grained sand	se,			0.1			
45_ 148.2_ - -	45.0			<b>Poorly Graded Sand (SP)</b> 45.0-53.0' - dark grayish brown (10YR 4/2), moist, loose to medium dense, fine-grained sand				0.1			
50 143.2_ -		10.0	SN-6		- - - - - - - -		•	0.0			
- - 55_ 138.2_	55.0			Silt (ML) 53.0-53,4' - gray (10YR 5/1), moist, stiff, some clay Clay (CL) 53.4-54.0' - gray (10YR 5/1), moist, stiff, low plasticity silt Clayey Sand (SC) 54.0 54.0 - gray (SC)				0.0			
				Poorly Graded Sand with Silt (SP-SM) 54.3-55.0' - dark grayish brown (10YR 4/2), fine-grained sar moist, loose Poorly Graded Sand (SP) 55.0-56.2' - very dark gray (10YR 3/1), moist to dry, loose, fine-grained sand							



BORING NUMBER: WI-CV-MW04-M SHEET 3 OF 7

### SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (440483.0 N, 1201341.6 E)

#### ELEVATION: 193.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Rotary Sonic, PS 600 Sonic Rig, 8" Casing x 7" Core Barrel

WATE	WATER LEVELS : DEPTH BELOW SURFACE (FT)			START : 1/24/17 10:45 END : 1/2				16:00	)	LOGG	ER : D.LuBell
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		U	R	PID EADIN	GS		
	INTERV	AL (FT)	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,			ig Zone	ace	ole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMBO	Breathin	Headspi	Above H		
133.2	2    65.0	10.0	SN-7	Clay (CL) 56.2-56.9' - olive brown (2.5Y 43), moist, stiff, low plasticity Clayey Sand with Gravel (SC) 59.6-58.5' - olive brown (2.5Y 4/3), moist, fine to medium-grained sand, clay, fine to coarse rounded gravel, loose to medium dense Clayey Sand (SC) 58.5-59.6' - olive brown (2.5Y 4/3), moist, loose, fine to medium-grained sand Poorly Graded Sand (SP)			· · ·	0.1			
128.2	2 - - - - - -			59.6-65.0' - olive brown (2.5Y 4/3), dry, loose, fine-grained sand, trace weak cementation         Poorly Graded Sand (SP)         65.0-69.0' - olive brown (2.5Y 4/3), dry, loose, fine-grained sand, trace weak cementation	  			0.0			
70_ 123.2	- - - - - - - -	10.0	SN-8	Poorly Graded Sand (SP) 69.0-75.0' - dark gray (2.5Y 4/1), dry, loose, fine-grained sar	nd 			0.0			- Bentonite Grout - - - - - - - - - - - - - - - - - - -
75_ 118.2	- 75.0 2 - - - - - - - - - - - -			Poorly Graded Sand (SP) 75.0-77.7' - dark gray (2.5Y 4/1), dry to moist, loose, fine-grained sand Silty Sand (SM) 77.7-79.2' - dark gray (2.5Y 4/1), dry to moist, medium densivery fine-grained sand, silt, trace fine rounded gravel	- - - - - - - - - - - - - - - - - - -			0.0		1005 - Possibly begin drill Head - shutdown Blown plug filter D ring 1135 - drilling	
80_ 113.2		10.0	SN-9	Poorly Graded Sand with Silt (SP-SM) 79.2-85.0' - dark gray (2.5Y 4/1) to olive brown (2.5Y 4/3), dr loose,very fine to fine-grained sand, trace weakly cemented	y, — - - - - - - - - - -			0.0			
85_ 108.2	85.0 2 - - - - - - - - - - - - - - -			Poorly Graded Sand with Silt (SP-SM) 85.0-86.0' - dark gray (2.5Y 4/1) to olive brown (2.5Y 4/3), dr loose,very fine to fine-grained sand, trace weakly cemented, with gravel, fine rounded (TILL?) Poorly Graded Sand with Silt (SP-SM) 86.0-88.0' - very dark grayish brown (2.5Y 3/2), moist, loose medium dense, fine to very fine-grained sand, weakly cemented	y, to			0.0			



WI-CV-MW04-M SHEET 4 OF 7

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (440483.0 N, 1201341.6 E)

ELEVATION: 193.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Rotary Sonic, PS 600 Sonic Rig, 8" Casing x 7" Core Barrel

1	WATER	LEVELS	3 :		START : 1/24/17 10:45	END	: 1/2	7/17	<u> 16:00</u>	)	LOGG	ER : D.LuBell
ſ	DEPTH F	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		ڻ.	R	PID EADIN	GS		
	l	INTERVA	AL (FT)				ΓŌ	e		1		
			RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		30LI(	ing Zo	pace	Ре	COMMENTS	WELL DIAGRAM
				SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above		
	103.2_ - - - - -		9.0	SN-10	Poorly Graded Sand (SP) 88.0-94.0' - olive brown (2.5Y 4/3), dry to moist, loose, very fine-grained				0.0			
					No Recovery		<u></u>				End drilling	
	95 98.2       	95.0	8.5	SN-11	94.0-95.0' <b>Poorly Graded Sand (SP)</b> 95.0-103.5' - dark gray (2.5Y 4/1) to olive brown (2.5Y 4/3), we to dry color), dry, loose, very fine to fine-grained sand, trace weakly cemented, trace to few silt	et			0.0		1/25/17 Start drilling 1/26/17	
	93.2 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _				No Recovery (Inferred as above) 103.5-105.0'				0.0			
	88.2 _    110 83.2 _ 		0.0	SN-12	No Recovery 105.0-115.0'							
		115.0			<b>Poorly Graded Sand with Silt (SP-SM)</b> 115.0-120.0' - olive brown (2.5Y 4/3), moist, medium dense, fine to very fine-grained sand		کر میں میں کہ کہ میں میں میں اور اور میں میں اور				Driller tags hole at 113', no recovery, not inside casing - fluid sands Probably water table	



WI-CV-MW04-M SHEET 5 OF 7

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (440483.0 N, 1201341.6 E)

ELEVATION: 193.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Rotary Sonic, PS 600 Sonic Rig, 8" Casing x 7" Core Barrel

WATER	WATER LEVELS : DEPTH BELOW SURFACE (FT)			START : 1/24/17 10:45 END : 1/27/17 16:00			LOGG	ER : D.LuBell			
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		U	R	PID EADIN	GS		
1	INTERV	AL (FT)				CLO	ē				
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		30LIG	ing Zo	pace	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above		
73.2		10.0	SN-13	Silt (ML) with Clay Lenses 120.0-125.0' - dark olive gray (5Y 3/2), moist, stiff to very stiff interbedded clay zones, low plasticity				0.0			
125	125.0				-						
68.2 130 63.2		10.0	SN-14	Silt (ML) with Clay Lenses 125.0-135.0' - dark olive gray (5Y 3/2), moist, stiff to very stiff interbedded clay zones, low plasticity				0.0			
	-				_						
135 58.2 140 53.2	135.0	10.0	SN-15	Clay (CL) 135.0-145.0' - dark gray (4/N), moist, very stiff, low to mediun plasticity, silt	n 			0.0		Isolation casing set at 135', advance 6" x 4"	
145_ 48.2_	145.0			<b>Lean Clay (CL)</b> 145.0-149.7' - very dark greenish gray (10Y 3/1), moist, very stiff, low plasticity				0.0			- Bentonite − Chips − - - - - - -
	-				_						✓ 20/40 Sand
150					_						



WI-CV-MW04-M SHEET 6 OF 7

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (440483.0 N, 1201341.6 E)

ELEVATION: 193.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Rotary Sonic, PS 600 Sonic Rig, 8" Casing x 7" Core Barrel

WATER	R LEVELS	3 :		START : 1/24/17 10:45	END	: 1/2	7/17	16:00	)	LOGG	ER : D.LuBell
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		U	R	PID EADIN	GS		
	INTERV	AL (FT)	ERV (ET)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		LIC LO	Zone	g	е	COMMENTS	WELL DIAGRAM
		NLOOVI	SAMPLE #/TYPE	MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMBO	Breathing	Headspa	Above Ho		
43.2		10.0	SN-16	<b>Poorly Graded Sand (SP)</b> 149.7-155.0' - very dark gray (3/N), moist, fine to very fine-grained sand, trace silt, trace clayey sand (SC) 149.7-150.5				0.0			
155	155.0			<b>Poorly Graded Sand (SP)</b> 155.0-160.0' - very dark gray (3/N), moist, loose, very fine to fine-grained sand, trace silt				0.0			2" Schedule - 80 - 0.010 Slot Screen
33.2		10.0	SN-17	Silt (ML) 160.0-165.0 - dark gray (4/N), moist to wet, stiff, trace very fine-grained sand		<u>.</u>		0.0			
165 28.2 170 23.2	165.0	10.0	SN-18	Silt (ML) 165.0-167.0' - dark gray (4/N), moist, stiff Silty Sand (SM) 167.0-171.0' - dark gray (4/N), moist, medium dense, very fine-grained sand (? sand)				0.0			
175 18.2	175.0			Poorly Graded Sand with Silt (SP-SM) 171.0-175.0' - dark gray (4/N), moist, medium dense, very fine-grained sand Clay (CL) 175.0-185.0' - dark gray (4/N), moist, very stiff, low plasticity organic odor				0.0			
180	1				-	///					-



WI-CV-MW04-M

SHEET 7 OF 7

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (440483.0 N, 1201341.6 E)

ELEVATION: 193.2 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Rotary Sonic, PS 600 Sonic Rig, 8" Casing x 7" Core Barrel

PROJECT NUMBER:

WATER LEVELS : ---START : 1/24/17 10:45 END: 1/27/17 16:00 LOGGER : D.LuBell PID READINGS DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 10.0 13.2 SN-19 0.0 185 185.0 8.2 Clay (CL)/Peat (PT)) 0.0 185.0-187.8' - dark greenish gray (10Y 4/1), moist to wet, stiff, organic root system, fibrous, silt, organic odor, peat Silty Sand (SM) 187.8-192.5' - dark gray (4/N), moist, dense, very fine-grained sand 190 10.0 SN-20 3.2 0.0 Clay (CL) 192.5-195.0' - dark gray (4/N), dry, hard 195 195.0 0.0 -1.8 Bottom of Boring at 195.0 ft bgs on 1/27/17 16:00



WI-CV-MW04-S

SHEET 1 OF 5

# SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (440487.0 N, 1201338.3 E)

ELEVATION: 193.2 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : RotarySonic, PS-600 Sonic Rig 6" Casing x 4" Core Barrel

PROJECT NUMBER:

WATER LEVELS : ---START : 1/29/2017 END LOGGER : R. Clennon DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing Headsp CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 193.2 Clayey Sand with Gravel (SW-SM) 0.0 0.0-1.2' - dark brown (10YR 3/3), moist to wet, dense Well Graded Sand with Silt (SW-SM) 1.2-3.7' - dark brown (10YR 3/3), moist, loose, fine to medium sand, little clay, trace to little subround gravel SN-1 5.8 Clayey Sand with Gravel (SW-SM) 3.7-5.8' - dark brown (10YR 3/3), moist to wet, dense 5 188.2 6.0 No Recovery 0.0 5.8-6.0 Well Graded Sand with Gravel (SW-SM) 6.0-12.9' - dark yellowish brown (10YR 4/2 transitioning to dark gravish brown (10YR 4/2), moist, medium dense, fine to medium sand, fine to coarse subround to angular gravel, nonplastic 10 183.2 6.9 SN-2 No Recovery 0.0 12.9-16.0' 15 178.2 16.0 0.0 Well Graded Sand with Clay and Gravel (SW-SC) 16.0-19.5' - dark grayish brown (10YR 4/2), moist, loose to medium dense, fine to coarse sand, fine to coarse subround to subangular gravel Well Graded Sand with Silt (SW-SM) 20 173.2 19.5-20.4' - dark grayish brown (10YR 4/3), moist, loose, fine sand, trace to little fine gravel 7.7 SN-3 Poorly Graded Sand (SP) 20.4-23.7' - dark grayish brown (2.5Y 4/2), moist, loose, fine-grained, little silt 0.0 No Recovery 23.7-26.0' 25 168.2 26.0 Poorly Graded Sand (SP) 0.0 26.0-26.5' - dark gravish brown (2.5Y 4/2), moist, loose, fine-grained, little silt Well Graded Sand with Gravel (SW) 0.0 26.5-29.3' - dark gray (10YR 3/2), moist, loose, fine to coarse sand, fine to coarse subround gravel, little silt 30



WI-CV-MW04-S

SHEET 2 OF 5

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (440487.0 N, 1201338.3 E)

ELEVATION: 193.2 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : RotarySonic, PS-600 Sonic Rig 6" Casing x 4" Core Barrel

PROJECT NUMBER:

WATER LEVELS : ---START : 1/29/2017 END LOGGER : R. Clennon DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 163.2 Poorly Graded Sand (SP) 29.3-34.2' - dark grayish brown (2.5Y 4/2), moist, loose, fine to medium sad, little fine to coarse subround to round gravel 8.2 SN-4 0.0 0.0 No Recovery 35 34.2-36.0' 158.2 36.0 0.0 Poorly Graded Sand (SP) 36.0-37.0' - dark grayish brown (2.5Y 4/2), moist, loose, fine to medium sad, little fine to coarse subround to round gravel Poorly Graded Sand with Silt (SP-SM) 37.0-38.2' - dark gravish brown (2.5Y 4/2), moist to wet (from drilling fluid), loose, fine sand, few fine subangular to subround ∖graveľ 40 Poorly Graded Sand (SP) 153.2 38.2-42.7' - dark gravish brown (2.5Y 4/2), moist, loose, fine-grained, trace little silt 6.7 SN-5 0.0 No Recovery 42.7-46.0' 0.0 45 148.2 46.0 Poorly Graded Sand (SP) 46.0-46.8' - dark grayish brown (2.5Y 4/2), moist, medium dense, fine-grained, trace little silt Poorly Graded Sand with Silt (SP-SM) 46.8-51.0' - dark grayish brown (2.5Y to 10YR 4/2), moist, loose to medium dense, fine grained 50 143.2 0.0 7.2 SN-6 0.0 Silty Sand (SM) 51.0-51.75' - dark grayish brown (2.5Y 4/2) to brown (2.5Y 4/3), moist, dense, fine-grained Poorly Graded Sand with Silt (SP-SM) Bentonite 51.75-53.2' - dark gravish brown (2.5Y to 10YR 4/2), moist, loose to medium dense, fine grained Grout No Recovery 55 53.2-56.0' 138.2 56.0 Silty Sand (SM) 56.0-57.2' - olive brown (2.5Y 4/3), moist to wet, dense, fine sand, little clay, nonplastic 0.0 Clay (CL) 57.2-57.9' - olive brown (2.5Y 4/3), moist, stiff, low to medium plasticity 60



WI-CV-MW04-S SHEET 3 OF 5

### SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (440487.0 N, 1201338.3 E)

### ELEVATION: 193.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotarySonic, PS-600 Sonic Rig 6" Casing x 4" Core Barrel

WA	TER	LEVELS	:		START : 1/29/2017	017 END :				LOGO	ER : R. Clennon	
DEF	TH B	ELOW SI	URFACE (	FT)	SOIL DESCRIPTION		U	R	PID EADIN	GS		
		INTERVA	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT RELATIVE DENSITY OR		OLIC LO	ng Zone	bace	lole	COMMENTS	WELL DIAGRAM
				SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above h		
13	3.2_ - - - - - - - - - - - - - - - - - - -		9.2	SN-7	Clayey Sand (SC) 57.9-60.3' - olive brown (2.5Y 4/3), moist, loose, fine-grained Clayey Sand (SC) 60.3-61.0' - olive brown (2.5Y 4/3), moist, dense, fine-grained Poorly Graded Sand (SP) 61.0-65.2' - olive brown (2.5Y 4/3), moist, loose, fine to very fine-grained, little silt	= 			0.0			
12	8.2	66.0			No Recovery							
	-				<ul> <li>b3.2-06.0</li> <li>Poorly Graded Sand (SP)</li> <li>66.0-67.4' - dark grayish brown (2.5Y 4/2), moist, loose, fine sand, little silt</li> <li>Silty Sand (SM)</li> <li>67.4-69.0' - grayish brown (2.5Y 5/2) to grayish brown (2.5Y 4/2), moist, medium dense, fine sand</li> </ul>			· · · · · · · · · · · · · · · · · · ·	0.0			
7 12:	0 3.2_ - - - - - -		8.0	SN-8	Poorly Graded Sand (SP) 69.0-74.0' - dark grayish brown (2.5Y 4/2), moist, loose, fine-grained			•	0.0			
7 118	5 8.2_	76.0			No Recovery 74.0-76.0' Poorly Graded Sand with Silt (SP-SM)				0.0			
8 11:	- - - - 3.2_ - - -		7.4	SN-9	76.0-83.4' - dark grayish brown (2.5Y 4/2), moist, loose, fine very fine-grained	to			0.0			
8 108	5_ 8.2_	86.0			No Recovery 83.4-86.0'							
9	- - - - - - - - - - - - - - - - - - -				Poorly Graded Sand with Silt (SP-SM) 86.0-87.4' - dark grayish brown (2.5Y 4/2), moist, loose, fine- very fine-grained Poorly Graded Sand (SP) 87.4-89.5' - olive brown (2.5Y 4/3), moist, loose, fine-grained little silt	to			0.0			



BORING NUMBER: WI-CV-MW04-S

SHEET 4 OF 5

### SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (440487.0 N, 1201338.3 E)

ELEVATION: 193.2 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : RotarySonic, PS-600 Sonic Rig 6" Casing x 4" Core Barrel

WATER LEVELS : ---START : 1/29/2017 END LOGGER : R. Clennon DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC | WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 103.2 No Recovery 89.5-96.0' 3.5 SN-10 95 98.2 96.0 Poorly Graded Sand (SP) 96.0-102.0 - olive brown (2.5Y 4/3), moist, loose, very fine-grained, little to few silt 0.0 100 93.2 6.0 SN-11 No Recovery 102.0-106.0' 0.0 105 88.2 106.0 Poorly Graded Sand with Silt (SP-SM) 0.0 106.0-115.8' - olive brown (2.5Y 4/3), moist, medium dense, very fine-grained Bentonite Chips 110 83.2 9.8 SN-12 -20/40 Sane 0.0 0.0 115 78.2 116.0 No Recovery 115.8-116.0' Poorly Graded Sand with Silt (SP-SM) 2 Schedule 116.0-120.7' - olive brown (2.5Y 4/3), moist, moderate dense to 80 - 0.010-Slot Screen dense, very fine-grained 0.0 120



BORING NUMBER: WI-CV-MW04-S

SHEET 5 OF 5

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (440487.0 N, 1201338.3 E)

ELEVATION: 193.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotarySonic, PS-600 Sonic Rig 6" Casing x 4" Core Barrel

PROJECT NUMBER:

WATER LEVELS : ---START : 1/29/2017 END LOGGER : R. Clennon SOIL DESCRIPTION PID READINGS DEPTH BELOW SURFACE (FT) SYMBOLIC LOG INTERVAL (FT) WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY Breathing Above I SAMPLE #/TYPE 73.2 Silt (ML) 120.7-126.0' - dark greenish gray (GLEY1 /1) to dark gray (10YR 4/1), moist, stiff to very stiff, interbedded clay lenses, SN-13 10.4 some very fine sand, low plasticity 0.0 125 68.2 126.0 Bottom of Boring at 126.0 ft bgs on



BORING NUMBER: WI-CV-MW05-M

SHEET 1 OF 9

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : West of runway (438254.5 N, 1201503.6 E)

ELEVATION: 190.6 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Track Rig, 8" Casing

WATER LEVELS : ---START : 2/1/17 13:00 END: 2/5/17 13:00 LOGGER : E. Bilyeu DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 190.6 Cleared 5' with vac truck, no description 5 5.0 185.6 Well Graded Sand (SW) 5.0-10.0' - dark yellowish brown (10YR 3/4), moist, loose, 90% fine to coarse subangular sand, 10% fine subangular gravel 0.0 5.0 SN-1 10.0 10 180.6 Well Graded Sand with Gravel (SW) Begin adding 8" 10.0-15.0' - dark yellowish brown (10YR 3/4), moist, loose, 80% fine to coarse subangular sand, 20% fine to medium casing subrounded gravel 0.0 15 10.0 SN-2 175.6 Well Graded Sand (SW) 15.0-18.5' - dark grayish brown (2.5Y 3/2), moist, loose, 95% fine to coarse subangular sand, 5% fine subrounded gravel 0.0 Poorly Graded Sand (SP) 18.5-20.0' - dark grayish brown (2.5Y 3/2), loose, 95% fine to medium subrounded sand, some sand, 5% fine subrounded 20 20.0  $170\overline{6}$ gravel Poorly Graded Sand with Silt and Gravel (SP-SM) 20.0-27.0' - (5Y 5/1), dry, 65% fine subrounded gravel, 25% nonplastic fines, 15% fine subrounded gravel 0.0 7.0 SN-3 25 165.6 0.0 27.0 Well Graded Sand with Gravel (SW) 27.0-30.0' - dark gravish brown (2.5Y 3/2), moist, loose, 85% fine to coarse subrounded sand, 15% fine subrounded gravel and fines downward to 30' 30



WI-CV-MW05-M SHEET 2 OF 9

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : West of runway (438254.5 N, 1201503.6 E)

#### ELEVATION: 190.6 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Track Rig, 8" Casing

W	WATER LEVELS :				START : 2/1/17 13:00 END : 2/5/17 13:00						LOGO	ER : E. Bilyeu
DE	EPTH E	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		U	R	PID EADIN	GS		
		INTERV	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		SOLIC LO	ing Zone	pace	Hole	COMMENTS	WELL DIAGRAM
				SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above		
1	60.6_ _ _		10.0	SN-4	Sandy Silt (ML) 30.0-32.5' - dry, loose, 65% nonplastic fines, 30% fine subrounded sand, 5% fine subrounded gravel	-					31-32' - sample bag ripped upon	
1	- - 35_ 55.6_ -	37.0			Poorly Graded Sand (SP) 32.5-37.0' - dark grayish brown (2.5Y 3/2), moist, loose, 95% fine to medium subangular sand, predominately fine grained, 5% fine gravel, trace silt				0.0		logged but not fully photographed, 100% recovery on sample	
	- - - 40				No Recovery 37.0-40.0'	-						
1	50.6 - - - - -		7.0	SN-5	Poorly Graded Sand with Gravel (SP) 40.0-47.0' - dark grayish brown (2.5Y 3/2), moist, loose, 85% fine to coarse subrounded predominately medium sand, 15% fine subrounded gravel, fines downward to dominate fine san	d			0.0			
1	45 45.6_ _ _	47.0			No Recovery			-	0.0			
1	- - 50_ 40.6_ - - -		8.0	SN-6	47.0-49.0' Poorly Graded Sand with Gravel (SP) 49.0-57.0' - dark grayish brown (2.5Y 3/2), loose, 85% fine to medium subrounded sand, 15% fine subrounded gravel	=          			0.0			
1	- 55 35.6_ - - -	57.0			53.0-55.0' - no gravel Poorly Graded Sand (SP) 57.0-63.0' - dark gravish brown (2.5Y 3/2), loose, 100% fine f	- - - - - - - - - - - - - - - - - - -			0.0			
	60				medium subrounded sand	-						



BORING NUMBER: WI-CV-MW05-M

SHEET 3 OF 9

Bentonite Grout

### SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : West of runway (438254.5 N, 1201503.6 E)

90

ELEVAT	ION: 19	90.6 ft		DRILLING CONTRACTOR : (	Casca	ade I	Drillin	g			
DRILLIN	G METH	IOD AND	EQUIPMENT	: Prosonic 600C Full-size Track Rig, 8" Casing							
WATER	LEVELS	8 :		START : 2/1/17 13:00 E	END :	2/5/	17 13	8:00		LOGG	ER : E. Bilyeu
DEPTH E	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		Ċ	RE	PID	GS		
	INTERV	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		SOLIC LO	ing Zone	pace	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above		
130.6_             		8.0	SN-7	Silty Sand (SM) 63.0-65.0' - dark grayish brown (2.5Y 3/2), moist, medium dense, 85% fine to medium subrounded sand, dominately fine grained, 15% low to medium plasticity fines No Recovery 65.0-67.0'				0.0			
	67.0	8.0	SN-8	No Recovery 67.0-69.0' Lean Clay (CL) 69.0-71.0' - dark grayish brown (2.5Y 4/2), moist, stiff, 90% fines, low to medium plasticity, slow to non dilatancy, medium dry strength, 10% fine sand Poorly Graded Sand with Clay (SP-SC) 71.0-77.0' - dark grayish brown (2.5Y 4/2), moist, loose, 90% fine to medium subrounded sand, 10% low to medium plastic fines, interbedded/interrelated)				0.0			
80 110.6 	87.0	8.0	SN-9	No Recovery 77.0-79.0' Poorly Graded Sand (SP) 79.0-80.5' - dark grayish brown (2.5Y 4/2), wet from drilling fluid, loose, 95% fine to medium subrounded sand, 5% fines Silty Sand (SM) 80.5-85.5' - dark grayish brown (2.5Y 3/2), moist, loose, 90% fine subrounded sand, 10% non to low plasticity fines Poorly Graded Sand (SP) 85.5-87.0' - dark grayish brown (2.5Y 4/2), moist, loose, 95% fine to medium subrounded sand, 5% nonplastic fines No Recovery				0.0			- Bentoni Grout
_				87.0-90.0'	_						



WI-CV-MW05-M SHEET 4 OF 9

### SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : West of runway (438254.5 N, 1201503.6 E)

ELEVATION: 190.6 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Track Rig, 8" Casing

WATER	LEVELS	:		START : 2/1/17 13:00	END	: 2/5/	17 1	3:00		LOGG	<u>ER : E. Bilyeu</u>
DEPTH E	DEPTH BELOW SURFACE (FT)			SOIL DESCRIPTION			PID READINGS				
		(	,			Ö	R	EADING	3S		
	INTERVA	AL (FT)				Г О	a				
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		Ĕ	g Zo	ge	e	COMMENTS	WELL DIAGRAM
			、 <i>,</i>	MOISTURE CONTENT, RELATIVE DENSITY OR		B	thing	dsp	ъ		
			SAMPLE	CONSISTENCT, SOIL STRUCTURE, MINERALOGT		ž	Srea	Hear	voq		
400.0			#/TYPE			0,	ш	_	4		
100.6				Poorly Graded Sand (SP)	-			0.0			- 14
-				90.0-95.0 - dark grayish brown (2.5Y 3/2), wet, dense, 91%	-						- XX
				line subrounded sand, 9% non to low plastic lines	-	19.12					KA KA -
-		7.0	SN-10		-						- 12 12
-					-						
-					-						- 12
-					_	te fe					
-					_						
95											
95.6				Sand with Silt (SP-SW)		% }+		0.0			
_				95.0-97.0' - dark grayish brown (2.5Y 3/2), moist, dense, 90%	6 _						
-				fine subrounded sand, 10% low plastic fines	_						
	97.0					° °					- 🕅 🕅
-				No Recovery	-						- 🕅 🕅
-				97.0-102.0	-						KI KI -
-					-						- 12 12
					-						- 12
100 -					_						- 🕅 🕅
90.6						1					
					-						KA KA -
_					_						
		5.0	SNI 11								
		5.0	SIN-11	Poorly Graded Sand (SP)	_						
				102.0-105.5' - dark grayish brown (2.5Y 4/2), wet, loose to	_						
_				dense, 95% fine subrounded sand, 5% fines	_						KA KA -
					_						- 12 12
405 -					-						X X -
105								0.0			$\otimes \otimes -$
00.0				Silty Sand (SM)				0.0			- 12
-				1055-1070' - dark gravish brown (2.5Y 4/2) wet medium	-						- 🕅 🕅
-	107.0			dense 80% fine sand 20% low plasticity fines	-						- 🕅 🕅
-	107.0			No Recovery							KA KA -
-				107 0-108 0'	_						
				Poorly Graded Sand (SP)							
				108.0-117.0' - dark gravish brown (2.5Y 4/2), medium dense	_						$\bigotimes$
				95% fine subrounded sand, 5% fines	, _						
110				,							K K -
80.6					-			0.0			- 🕅 🕅
-					_			I			KA KA -
-					-	[		I I			- 🕅 🕅
		9.0	SN-12		-			I I			- 12
- 1					-			I			- 18
	1				_			I I			$\bowtie$
	1				-			I I			KA KA -
-	]				_			I I			
115_					_	1		I I			
75.6					_			0.0			$\bowtie$
					_			I I			- 🕅 🕅
-					_		1	I			KI KI -
- 1	117.0							I I			N N -
-				Poorly Graded Sand (SP)	_			I			M M -
-				$117.0-122.0^{\circ}$ - dark grayish brown (2.5Y 4/2), medium dense	, _			I I			- 🕅 🕅
- 1				3570 mile Subi Ounided Sand, 370 miles	-	t i		I I			- 🕅 🕅
-					-			I I			KA KA -
120					_			I I			- 🕅 🕅
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								I I			



BORING NUMBER: WI-CV-MW05-M

SHEET 5 OF 9

### SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : West of runway (438254.5 N, 1201503.6 E)

ELEVATION: 190.6 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Track Rig, 8" Casing

WATER LEVELS : ---START : 2/1/17 13:00 END: 2/5/17 13:00 LOGGER : E. Bilyeu DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing Headspa CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 70.6 10.5 SN-13 Lean Clay (CL) 122.0-125.0' - dark brown (10YR 4/1), very stiff, medium plasticity, dry strength 125 65.6 0.0 127.0 No Recovery 127.0-132.0' 130 60.6 SN-14 5.5 Poorly Graded Sand (SP) with Clay 132.0-133.0 - dark brown (10YR 4/1), wet, loose, 90% fine to medium subrounded sand, 10% coarse plastic fines Poorly Graded Sand (SP) 133.0-137.0' - dark grayish brown (2.5Y 4/2), moist, medium 135 dense, 95% fine to medium subrounded sand, 5% fines, trace 55.6 0.0 gravel 137.0 No Recovery 2/3/17 137.0-141.0' 140 50.6 Well Graded Sand (SW) 141.0-143.0' - dark gray (2.5Y 4/1), wet, loose, 95% fine to 6.0 SN-15 coarse subrounded sand, 5% low plasticity fines 0.0 Silty Sand (SM) 143.0-144.0' - dark gray (2.5Y 4/1), wet, loose, 80% fine to medium subrounded sand, 20% low plasticity fines 145 Poorly Graded Sand with Silt and Gravel (SP-SC) 144.0-145.0' - dark gray (2.5Y 4/1), wet, loose, 70% fine to medium subrounded sand, 15% low plasticity fines, 15% fine 45.6 gravel 147.0 Poorly Graded Sand (SP) 0.0 145.0-147.0' - dark gray (2.5Y 4/1), wet, loose, 95% fine to medium subrounded sand, 5% fines and sand No Recovery 147.0-148.5' 150



WI-CV-MW05-M SHEET 6 OF 9

### SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : West of runway (438254.5 N, 1201503.6 E)

#### ELEVATION: 190.6 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Track Rig, 8" Casing

WATE	R LEVELS	s :		START : 2/1/17 13:00 END : 2/5/17 13:00					LOGG	ER : E. Bilyeu	
DEPTH	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		U		PID READIN	GS		
	INTERV	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		SOLIC LO	ing Zone	pace	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above I		
40.6		8.5	SN-16	Poorly Graded Sand (SP) 148.5-154.0' - dark gray (2.5Y 4/1), wet, loose, 95% fine to medium subrounded sand, 5% nonplastic fines, grades dow to finer sand beginning at 154'	n _ _ _ _ _		•	0.0			
155_ 35.6	157.0			Poorly Graded Sand (SP) 154.0-157.0' - same as above except fine dominately fine sa	nd 			0.0			
	-			No Recovery 157.0-159.0'							Chips –
160_ 30.6	-			<b>Poorly Graded Sand (SP)</b> 159.0-167.0' - dark gray (2.5Y 4/1), wet, medium dense, 95% fine to medium subrounded sand, 5% nonplastic fine and fin subrounded gravel	e _			0.0			<ul> <li>&lt;</li></ul>
		8.0	SN-17		-						
165_ 25.6	167.0			Well Graded Sand (SW)				0.0		Backfilled two	2" Schedule – 80 - 0.010- Slot Screen
170 20.6		10.5	SN-18	167.0-173.5' - black (2.5Y 5/1), wet, loose, 95% fine to coars subrounded sand, 5% fine subrounded gravel, trace fines	ie			0.0		bags of bentonite from 177-170', set 8" casing at 172', fallow bentonite to hydrate 1 hour advance 8" casing to 177' bgs, telescope with 6" casing, 4" barrel	
175 15.6				Silt (ML) 173.5-177.0' - dark gray (GLEY1 4/N), moist, stiff, 100% nonplastic fines, no dry strength				0.0			
180	  			Silts/Lean Clay (ML/CL) 177.0-187.0' - (GLEY1 4/0), wet, stiff, thinly laminated, low plasticity and medium plasticity fines with varying dry streng	ths _ _					Bottom 8" casing	
							a		1		
1	1	1					1		1		



WI-CV-MW05-M SHEET 7 OF 9

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : West of runway (438254.5 N, 1201503.6 E)

ELEVATION: 190.6 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Track Rig, 8" Casing

WATER LEVELS :				START : 2/1/17 13:00	END	: 2/5/	17 1	3:00		LOGG	ER : E. Bilyeu
DEPTH E	BELOW SI	JRFACE (	FT)	SOIL DESCRIPTION		c)	R		GS		
	INTERVA	AL (FT)	-RY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		LIC LO	Zone	8	<u>e</u>	COMMENTS	WELL DIAGRAM
		120012	SAMPLE #/TYPE	MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMBC	Breathing	Headspa	Above Ho		
10.6 _ _ _ _ _ _ _		10.5	SN-19					0.0			
- 185 5.6 - -	107.0							0.0			
- - - 190	187.0			Silts/Lean Clay (ML/CL) 187.0-197.0' - (GLEY1 4/0), wet, stiff, thinly laminated, low plasticity and medium plasticity fines with varying dry strengt							
0.6					-			0.0			
195 -4.4 		10.5	SN-20	Silts/Lean Clay (ML/CL) 197.0-207.0' - (GLEY1 4/0), wet, stiff, thinly laminated, low				0.0			
				plasticity and medium plasticity fines with varying dry strengt	:hs _ - - - - - -			0.0			
	207.0							0.0			
- - - 210_				Silts/Lean Clay (ML/CL) 207.0-217.0' - (GLEY1 4/0), wet, stiff, thinly laminated, low plasticity and medium plasticity fines with varying dry strengt	:hs _ 					2/5/17	



WI-CV-MW05-M

SHEET 8 OF 9

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : West of runway (438254.5 N, 1201503.6 E)

ELEVATION: 190.6 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Track Rig, 8" Casing

PROJECT NUMBER:

WATER LEVELS : ---START : 2/1/17 13:00 END : 2/5/17 13:00 LOGGER : E. Bilyeu DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE -19.4 0.0 10.0 SN-21 215 -24.4 0.0 217.0 Silt (ML) 217.0-227.0' - (GLEY1 4/0), wet, stiff, 100% no plasticity fines, no dry strength 220 -29.4 0.0 10.0 SN-22 225 0.0 -34.4 227.0 Silt (ML) 227.0-233.0' - (GLEY1 4/0), wet, stiff, 100% no plasticity fines, no dry strength 230 0.0 -39.4 10.0 SN-23 Sandy Silt (ML) 233.0-237.0' - (GLEY1 4/0), moist, medium stiff, 65% nonplastic fines, 35% fine subrounded sand 235 -44.4 0.0 237.0 Sandy Silt (ML) 237.0-247.0' - (GLEY1 4/0), moist, medium stiff, 65% nonplastic fines, 35% fine subrounded sand 240



WI-CV-MW05-M

SHEET 9 OF 9

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : West of runway (438254.5 N, 1201503.6 E)

ELEVATION: 190.6 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Track Rig, 8" Casing

PROJECT NUMBER:

WATER LEVELS : ---START : 2/1/17 13:00 END : 2/5/17 13:00 LOGGER : E. Bilyeu DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole Breathing 7 MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE -49.4 n n 8.0 SN-24 245 -54.4 0.0 247.0 Sandy Silt (ML) 247.0-249.0' - (GLEY1 4/0), moist, medium stiff, 65% nonplastic fines, 35% fine subrounded sand Sandy Silt with Gravel (ML) 249.0-255.0 - (GLEY1 4/N), moist, medium dense, 60% nonplastic fines, 25% fine subrounded sand, 15% subrounded 250 -59.4 0.0 fine gravel 9.5 SN-25 255 0.0 -64.4 Sandy Silt (ML) 255.0-257.0' - (GLEY1 4/0), moist, medium stiff, 65% nonplastic fines, 35% fine subrounded sand 257.0 Bottom of Boring at 257.0 ft bgs on 2/5/17 13:00 Backfill to 175' with 3/4" bentonite pellets



WI-CV-MW05-S SHEET 1 OF 5

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (438248.0 N, 1201506.3 E)

ELEVATION: 190.4 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotoSonic, Terrasonic short stroke with 4" X 6" Core Barrel

WATER	LEVELS	:		START : 2/9/17 14:45	END	: 2/10	)/17 ·	14:55		LOGG	ER : J. Frnak
DEPTH E	BELOW SI	JRFACE (	FT)	SOIL DESCRIPTION		U.	R	PID EADING	ss		
	INTERVA	RECOVE	RY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT RELATIVE DENSITY OR		OLIC LO	ng Zone	pace	lole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above I		
190.4 - - - - -	0.0		SN-1	Cleared with air knife and vac truck for utility locating 0.0-5.0'							
5	5.0				_						
185.4 _ _ _ _	8.0	3.0	SN-2	Well Graded Sand (SW) 5.0-20.0' - dark yellow brown (10YR 3/4), moist, loose, fine to coarse sand and gravel, coarse	)		0.0	0.0			
10 180.4		5.0	SN-3		-		0.0	0.1			
-	13.0			- trace cobbles	-			0.1			
15_ 175.4_ - -		5.0	SN				0.0				
  20	18.0				-			0.2			
170.4_ _ _ _		5.0	SN-4	Well Graded Sand (SW) 20.0-22.0' - dark gray brown (10YR 3/2), moist, loose, fine to coarse sand and fine gravel Poorly Graded Sand (SP)	-		0.0				
25_ 165.4_ - -	23.0	5.0	SN-5	22.0-23.0' - dark gray brown (10YR 3/2), moist, loose, fine to medium sand <b>Poorly Graded Sand (SP)</b> 23.0-28.0' - dark gray brown (10YR 3/2), moist, loose, fine to medium sand, fine to coarse gravel, trace silt	- - - - - - - - - - - - - - -		0.0	0.4			
- - - 30	20.0			Poorly Graded Sand (SP) 28.0-30.6' - dark gray brown (10YR 3/2), moist, loose, fine to medium sand	-			0.2			



BORING NUMBER: WI-CV-MW05-S

SHEET 2 OF 5

### SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (438248.0 N, 1201506.3 E)

ELEVATION: 190.4 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotoSonic, Terrasonic short stroke with 4" X 6" Core Barrel

WATER	RLEVELS	S :		START : 2/9/17 14:45	END	2/10	)/17	14:55	;	LOGG	ER : J. Frnak
DEPTH	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		U	R	PID EADING	3S		
	INTERV	AL (FT)				IC LC	one			COMMENTS	WELL DIAGRAM
		RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		IBOL	thing Z	Ispace	e Hole	CONNINENTS	
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYN	Breat	Head	Above		
160.4					_						- 12
-				Well Graded Sand with Fine to Coarse Gravel (SW) 30.6-38.0' - dark brown and gray (2.5Y 3/2), moist, loose, trac	e _						
-	-			silt	-						- 🕅 🕅
-		7.5	SN-6		_		0.0	0.1			
-					_		0.0	0.1			
35 -	-				-						- 🕅 🕅
155.4					_						× × -
-	-				_						
-					_						
-	38.0			No Recovery				0.5		Drv in spots due	- 🕅 🕅
-				38.0-42.0'	_					to advancement	
40					_					barrel fracture	× × -
150.4					-						- 🕅 🕅
-					_						
-				Poorly Graded Sand with Gravel (SP)	_						
-		6.0	SN-7	42.0-49.6' - dark brown and gray (2.5Y 3/2), dry to damp, loose, very fine to fine sands, subrounded gravel	_		0.0	0.4			
-					_						
45_	-				_						
145.4	-				_						
-	-				-						- 🎗 🕅
-	18.0				_						
-					_			0.1			
-					_						
50_ 140_4				Poorly Graded Sand (SP)							
-				medium sands	_						
-					_						
	-	46.5			-						- 🕅 🕅
-	1	10.0	SN-8		_		0.0	0.2			
					_						Bentonite – Grout –
55_ 135.4	-				_						- 10
	]				_						
	1				_						
-	58.0				_						- 🕅 🕅
-				- fine to coarse gravel at 58-59'	_			0.1		Continued drilling on	
	1			- 0.2-0.3' thick silt lenses at 59.3'. 63.6' and 66.5'	-					2/10/17	
00						. · ·					



WI-CV-MW05-S

0.2

SHEET 3 OF 5

### SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (438248.0 N, 1201506.3 E)

ELEVATION: 190.4 ft

85 105.4

90

88.0

DRILLING CONTRACTOR : Cascade Drilling

- trace silt at bottom

PROJECT NUMBER:

DRILLING METHOD AND EQUIPMENT : RotoSonic, Terrasonic short stroke with 4" X 6" Core Barrel WATER LEVELS : ---START : 2/9/17 14:45 END: 2/10/17 14:55 LOGGER : J. Frnak DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY Breathing . Above I SAMPLE #/TYPE 130.4 10.0 SN-9 0.2 0.0 65 125.4 68.0 0.0 - slight cementation 68-70' 70 120.4 Silt (ML) 70.7-72.0' - gray-brown (2.5Y 4/2), moist, stiff, trace fine sand Poorly Graded Sand with Silt (SP-SM) 72.0-90.0' - dark brown (2.5Y 4/2), moist, loose 10.0 SN-10 0.0 0.0 75 115.4 78.0 0.1 80 110.4 - dry at 80.9-81.7' 10.0 SN-11 0.0 0.2



BORING NUMBER: WI-CV-MW05-S

SHEET 4 OF 5

### SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (438248.0 N, 1201506.3 E)

ELEVATION: 190.4 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : RotoSonic, Terrasonic short stroke with 4" X 6" Core Barrel

PROJECT NUMBER:

WATER LEVELS : ---START : 2/9/17 14:45 END: 2/10/17 14:55 LOGGER : J. Frnak DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole Breathing 7 MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 100.4 Poorly Graded Sand (SP) 90.0-99.5' - dark brown (2.5Y 3/2), moist, loose 10.0 SN-12 0.0 0.1 95 95.4 98.0 0.2 100 Silty Sand (SM) 99,5-112.5' - brown (2.5Y 3/2), moist, loose, medium dense, very fine to fine sands 90.4 8.0 SN-13 0.0 0.1 105 85.4 108.0 0 1 Bentonite 110 Chips 80.4 -20/40 Sand Poorly Graded Sand (SP) 9.5 SN-14 112.5-113.2' - brown (2.5Y 3/2), moist, loose, fine sand 0.0 0.0 Silty Sand (SM) 113.2-114.3' - brown (2.5Y 3/2), moist, loose, medium dense, 115_ 75.4 very fine to fine sands Poorly Graded Sand (SP) 114.3-116.7' - dark gray-brown (2.5Y 4/3), moist, loose, fine sand Silty Sand (SM) 116.7-120.5' - brown (2.5Y 3/2), moist, loose, medium dense, 118.0 very fine to fine sand 0.0 Schedule 120



WI-CV-MW05-S

SHEET 5 OF 5

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (438248.0 N, 1201506.3 E)

ELEVATION: 190.4 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotoSonic, Terrasonic short stroke with 4" X 6" Core Barrel

WATER LEVELS :				START : 2/9/17 14:45	END	: 2/1	0/17	14:58	5	LOGG	ER : J. Frnak
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		(1)	R		GS		
1	INTERV	AL (FT)				ĬŎ	<i>m</i>	1	r-	1	
		RECOVE	RY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		DLIC	g Zon	e	e	COMMENTS	WELL DIAGRAM
				MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY SOIL STRUCTURE MINERALOGY	,	MBC	athing	edspe	ve Ho		
			SAMPLE #/TYPE			SΥ	Bre	Hea	Abo		
70.4	-				_						80 - 0.010 Slot Scroot
-	-	6.0	SN-15	Poorly Graded Sand (SP) 120 5-123 5' - dark brown (2 5Y 4/3) wet loose very fine to	. –		0.0				
-	-			fine sands	′ – _						
-	-				_						() 특징 -
-					-			0.0			· 目:   · -
-	124.0			Clay with Silt (ML-CL	_		1				
				123.5-124.0' - dark brow (10YR 4/1), moist, stiff Bottom of Boring at 124.0 ft bas on 2/10/17 14:55	/ -						-
				Bollom of Bolling at 124.0 it bys of 2/10/17 14.55	_						
					_						-
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WI-CV-MW06-M SHEET 1 OF 9

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (437400.6 N, 1202641.2 E)

ELEVATION: 197.9 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Rotary Sonic ProSonic PS600 Sonic Rig, 8" Casing x 7" Core Barrel, 6" casing x 4" Core Barrel

WATER LEVELS :				START : 2/1/17 08:35	END	2/5/	17 13	3:00		LOGG	ER : R. Clennon
DEPTH E	BELOW SI	JRFACE (	FT)	SOIL DESCRIPTION		U	R	PID EADING	s		
	INTERVA	AL (FT) RECOVE	ERY (FT) SAMPLE	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		уумволіс го	3reathing Zone	Headspace	bove Hole	COMMENTS	WELL DIAGRAM
197.9_			#/TYPE	Cleared via vac truck/hand clearance	_	05	ш	-	<		
5	5.0			Well Graded Sand (SWI)				0.0			
-	8.0	3.0	SN-1	5.0-8.0' - dark yellowish brown (10YR 3/4), wet, loose to medium dense, fine to coarse-grained, little silt, fine gravel	- - - -			0.0			
-  10_    		6.5	SN-2	<ul> <li>Well Graded Sand (SW)</li> <li>8.0-9.2' - dark yellowish brown (10YR 3/4), wet, loose to medium dense, fine to coarse-grained, little silt, fine gravel</li> <li>Poorly Graded Sand (SP)</li> <li>9.2-12.0' - dark grayish brown (2.5Y 4/2), wet, loose to mediu dense, fine to medium sand, trace coarse sand and fine grave</li> </ul>	 um el						
- - - 15 182.9_	16.0	0.0		Poorly Graded Sand (SP) 12.0-13.75' - dark grayish brown (2.5Y 4/2), moist, loose, fine-grained, trace coarse sand, fine gravel Poorly Graded Sand with Gravel (SP) 13.75-14.5' - dark grayish brown (2.5Y 4/2), moist, loose, fine-grained, trace coarse sand, fine gravel No Recovery				0.0			
  20 177.9		7.3	SN-3	14.5-16.0' Well Graded Sand (SW) 16.0-16.8' - dark grayish brown (10YR 4/0), wet/?, loose, fine coarse subangular gravel Poorly Graded Sand (SP) 16.8-21.5' - dark grayish brown (10YR 4/0), moist, loose, medium-grained, trace fine to coarse subround to subangula gravel	r _			0.0			
- - - 25_ 172.9_	26.0			Poorly Graded Sand with Gravel (SP) 21.5-23.3' - brown (10YR 4/3), moist, loose, fine to medium sand, fine to coarse subround gravel No Recovery 23.3-26.0'				0.0			
- - - - - - - - - - - - - - - - - - -				Well Graded Gravel with Sand (GW) 26.0-27.1' - dark gravish brown (10YR 4/2), wet, loose, medium sand, fine to coarse subrounded gravel Well Graded Sand with Gravel (SW) 27.1-28.75' - dark brown (10YR 4/2) to brown (10YR 4/3), we loose, medium to coarse sand, fine to coarse subround grave				0.0			



BORING NUMBER: WI-CV-MW06-M SHEET 2 OF 9

### SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (437400.6 N, 1202641.2 E)

ELEVATION: 197.9 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Rotary Sonic ProSonic PS600 Sonic Rig, 8" Casing x 7" Core Barrel, 6" casing x 4" Core Barrel

V	VATER	LEVELS	5:		START : 2/1/17 08:35	END	: 2/5/	17 1	3:00		LOGG	ER : R. Clennon
1	DEPTH E	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION				PID	20		
	1						Ö			33		
		INTERV					l D	one			COMMENTS	WELL DIAGRAM
			RECOVI	ERY (FT)	MOISTURE CONTENT RELATIVE DENSITY OR		G	z ɓu	Dace	9e	CONNINEINTS	
					CONSISTENCY, SOIL STRUCTURE, MINERALOGY		MB	athi	adsp	ve F		
				#/TYPE			S	Bre	光	Abc		
T	167.9				Well Graded Gravel with Sand (GW)							
	_		91	SN-4	28.75-29.4' - dark grayish brown (10YR 4/2), wet, loose,	_	1::	1				- 12 12
	_		0.1	OIT I	medium sand, fine to coarse subrounded gravel	/ r-						KI KI –
	_				Well Graded Sand with Gravel (SW)	-	-					N N -
	_				29.4-30.5 - dark brown (101R 4/2) to brown (101R 4/3), wet	,   -						X X -
	_				Woll Graded Gravel with Sand (GW)	-   -	-					- 18
					30 5-31 3' - dark gravish brown (10YR 4/2) wet loose							
					medium sand, fine to coarse subrounded gravel	-			0.0			×× -
	35				Well Graded Sand with Gravel (SW)							
	102.9	36.0			31.3-35.1' - dark brown (10YR 4/2) to brown (10YR 4/3), wet	, /-	-					- 🕅 🕅
	-	30.0			\loose, medium to coarse sand, fine to coarse subround grave	<u> </u>	••					- 🕅 🕅
	-				No Recovery	/-		1				
					Vall Craded Cravel with Sand (CMI)		<b>!::</b>	1	0.0			
	_				36 0-39 3' - gravish brown (10YR 4/2) wet loose fine to	-	••					X X -
	-				coarse subround gravel, medium to coarse sand	-	:::	1				X X -
	-					-		1				X X -
	40				Well Graded Sand with Gravel (SW)	、 -						
	157.9				39.3-41.9 - brown (10YR 4/3) and dark grayish brown (10YF	< -						
	_		5.9	SN-5	subround to subangular gravel, cobbles 0.5'	- 30	-					- 🕅 🕅
	_				·····	-	-					X X -
	-				No Recovery	-			0.0			- 🛛 🖓
	-				41.9-46.0'	-						
						_						
	_					_	-					- 12 12
	45					-	-					K K -
	152.9											
		46.0				_	-					
	_				Well Graded Gravel (GW)	_	1:::	1				N N -
	_				46.0-49.3' - dark gray (10YR 4/1), fine to coarse, subangular	to _	<b>!::</b>	1	0.0			XX -
	-				Touria	-	1		0.0			- 🕅 🕅
	_					-		1				- 12
						_	1:::	1				
	<b>-</b> 0 -				Well Graded Sand with Gravel (SW)	-						- 12 12
	50				49.3-51.0' - gravish brown (2.5Y 4/2), moist to wet, loose, find	e —						$\otimes \otimes$ -
	ש. ודי				to medium sand, fine to coarse, subangular to subround grav	vel -	1					- 🕅 🕅
	-		8.5	SN-6	Poorly Graded Sand with Gravel (SP)	-		1				Ka Ka -
					51.0-52.7' - dark grayish brown (2.5Y 4/2), moist, loose, fine	to _		·				
	-				medium sand, fine subangular to subround gravel			j	0.0			K K -
	-				Poorly Graded Sand (SP)	-		1	0.0			98 -
	-				52.7-54.5' - dark grayish brown (2.5Y 4/2) to olive brown (2.5	5Y -		1				KA KA -
	-				4/3), moist, loose, fine-grained, trace coarse sand							
	55_				No Recovery							X X _
	142.9	50.0			54.5-56.0'	-	1					- 🕅 🕅
	-	0.00			Poorly Graded Sand (SP)							X X -
	-				56.0-58.2' - olive brown (2.5Y 4/3. moist to wet. loose	-						- 🕅 🕅
	-				medium-grained, trace fine gravel, little coarse sand	-						
	_				·	_						
	-				Poorly Graded Sand (SP)	-		1	0.0			- 🕅 🕅
	_				58.2-60.7' - olive brown (2.5Y 4/3, moist to wet, loose,	-		1				K K -
	60				tine-grained, trace tine gravel, little coarse sand	-		1				- 🕅 🕅
F							1	l I				
							1					
-												



WI-CV-MW06-M SHEET 3 OF 9

### SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (437400.6 N, 1202641.2 E)

ELEVATION: 197.9 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Rotary Sonic ProSonic PS600 Sonic Rig, 8" Casing x 7" Core Barrel, 6" casing x 4" Core Barrel

WATER LEVELS :				START : 2/1/17 08:35	END	: 2/5/	17 13	3:00		LOGG	ER : R. Clennon
DEPTH B	ELOW SI	JRFACE (	FT)	SOIL DESCRIPTION		<i>"</i>	R		29		
	INTERVA	AL (FT)				ğ	a)				
	1	RECOVE	RY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		DLIC	j Zoni	8	e	COMMENTS	WELL DIAGRAM
				MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY SOIL STRUCTURE MINERALOGY		MBC	athing	adsba	ve Ho		
			SAMPLE #/TYPE			SYI	Bre	He	Abo		
137.9_					_						
_		4.7	SN-7	No Recovery	-	-					- 12
_				60.7-66.0	-						
-					-	-					- 12
-					-	·					- 18
					_						
65 -					-						- 18
132.9					_						
-	66.0			Well Graded Gravel (GW)		••					- 🕅 🕅
_				66.0-67.7' - slough?	-						
_				-	_			0.0			
_				Poorly to Moderate Graded Sand with Gravel (SP/SW)	-	••					- 18
				medium-grained. little coarse sand and fine to coarse subrou	nd -						
70				to subangular gravel	-	••					- 🛛 🖓
127.9				Poorly Graded Sand (SP)		••					
_		7.6	SN-8	70.2-73.6' - dark brown (10YR 3/3) to olive brown (2.5Y 4/3),	-		0.0				- 18
-				moist, loose, fine-grained, trace fine to coarse subrounded	-		0.0				- 2
				giavei	_						
-					-			0.0			
				No Recovery	_						
75				73.6-76.0'	-						- 10 10
122.9					_						
_	76.0			Dearthy Creded Sand (SD)							- 18
-				76.0-83.2' - dark gravish brown (2.5 4/2), moist, loose.	-						- 🕅 🕅
_				fine-grained	_						
-					-			0.0			- 12
					_						
80 -					-						- 12
117.9											
_		7.2	SN-9		-						
-					-						- X
					_						
-					_	-					- 12
_				No Recovery 83 2-86 0'	_						
85					-						Grout –
112.9					_						
_	86.0			Dearthy Created Sand (SD)							- 🕅 🕅
-				86.0-92.75' - dark gravish brown (2.5 4/2), moist, loose,	-						- 12
				fine-grained	_						
-					-						- 12
					_						
00 -					-						- X X
90_						t ····					
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WI-CV-MW06-M SHEET 4 OF 9

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (437400.6 N, 1202641.2 E)

ELEVATION: 197.9 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Rotary Sonic ProSonic PS600 Sonic Rig, 8" Casing x 7" Core Barrel, 6" casing x 4" Core Barrel

1	WATER LEVELS :			START : 2/1/17 08:35	END	: 2/5	17 1	3:00		LOGG	ER : R. Clennon	
Г	DEPTH E	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION				PID			
	1		NI (ET)				8	R		32		
		INTERVA	ι (⊢Ι)		SOU NAME LISSS OPOUR SYMPOL COLOR		U U	one				WELL DIAGRAM
L			RECOVE	ERY (FT)	SOIL NAME, USUS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		0L	j2 pr	ace	ole	COMMENTS	
L					CONSISTENCY, SOIL STRUCTURE, MINERALOGY		MB	athir	adsp	ě		
L				SAMPLE #/TYPF	······································		Σ	Bre	Τe	Abo		
t	107.9								0.0			
L	_		6.0	SN 10		_						
L			0.0	SIN-10		_						
L	_					_						- 18
L	_					-						- XX
L	-				No Recovery	-						- 🕅 🕅
L	-				92.75-96.0'	-						- XX
L	-					-	·					
L	95					_						
L	102.9					_						
L	_	96.0										N N -
L	-				Poorly Graded Sand (SP)	~ -						X X -
L	-				4/3) moist loose to medium dense fine-grained little silt	т <u>–</u>						- 18
L	-					-						- 12 12
	_					_			0.0			$\bowtie$
						_						
L						_						K K -
L	100											$\otimes$ $\otimes$ -
L	97.9					-						X X -
L	-		6.8	SN-11		-						- 13
L	_					-						X X -
L	-					-						
L					No Popovoru		<u> ` .</u>					
L	_				102 8-106 0'	_						K K -
L	_				102.0-100.0	_						9 9 -
L	105					-						- XX
L	92.9								0.0			
L		106.0				-						X X -
L					Poorly Graded Sand with Silt (SP-SM)							
L	_				106.0-110.0' - dark grayish brown (2.5Y 4/2) to olive brown	_	目冑					XX -
L	_				(2.5Y 4/3), moist, moderate dense, very fine to fine sand	_	出出					- 🕅 🕅
L	-					-						- 🕅 🕅
L	-					-	目冑					- 12 12
L	_					-	日日		0.0			- 12 12
	110_							1	I			
	87.9				Silty Sand (SM)	_		1				
	_		7.8	SN-12	110.0-111.7' - dark brown (2.5Y 4/3), moderate dense to	_		0.0				X X -
	-		-			-		0.0				- 🕅 🕅
	-				Poorly Graded Sand with Silt (SP-SM)	-	臣臣	1	0.0			× × -
	-				111.7-112.7' - dark grayish brown (2.5Y 4/2) to olive brown	7	┠┼┼					- 🕅 🕅
	_				112 7-113 5' - dark brown (2 5V 4/3) moderate dense to		<u>u T</u>	1				
					\\dense, very fine sand, few laminations	/ -			0.0			- 🕅 🕅
	82 0				Poorly Graded Sand with Silt (SP-SM)	_' -	1					KI KI –
	02.9	116.0			113.5-113.8' - dark grayish brown (2.5Y 4/2) to olive brown	-						N N -
	-				n (2.5Y 4/3), moist, moderate dense, very fine to fine sand		HI					
					No Recovery	/_						
	_				\113.8-116.0'		V///					
	-				Silty Sand (SM)	IF-	伯伯					- 🕅 🕅
	-				dense very fine sand few laminations	-	自出	1	0.0			- 🕅 🕅
	-						出	1				Ka Ka -
	120					12						
T							ľ					



WI-CV-MW06-M SHEET 5 OF 9

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (437400.6 N, 1202641.2 E)

ELEVATION: 197.9 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Rotary Sonic ProSonic PS600 Sonic Rig, 8" Casing x 7" Core Barrel, 6" casing x 4" Core Barrel

				START : 2/1/17 08:35	END	: 2/5/	17 1	3:00		LOGG	ER : R. Clennon
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION				PID	~~		
1	NITERI	AL (ET)				8	ĸ		60		
1	INTERV					U L	anc				
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		Ē	g Zd	ace	ole	COMMENTS	WELL DIAGRAIN
				CONSISTENCY SOIL STRUCTURE MINERALOGY	/	Ϋ́B	athin	dsp	еH		
1			SAMPLE #/TVDE			γ	Bre	Hee	Abov		
77.9	-		#/IIFE	Clavey Sand (SC)	П	111	-	1			
	1	10.0	<u></u>	117 1-117 7' - olive brown (2 5Y 4/3) wet to moist moderat	e   [	<b>K</b>		I 1			N N -
-		10.3	SN-13	dense	-   -			I 1			
				Poorly Graded Sand with Silt (SP-SM)				I 1			
	_			117.7-119.8' - dark grayish brown (2.5Y 4/2) to olive brown	115			I 1			
	-			(2.5Y 4/3), moist, moderate dense, very fine to fine sand, fir	ie to∥∣_						- 🕅 🕅
	-			coarse subround gravel		V///	1	0.0			- 🕅 🕅
	1			Liayey Sand (SC)	~   -			I 1			K K -
125	1			sand	e   -			I 1			- 12
72.9				Silty Sand (SM)	—/T_			I 1			
	126.0			120.5-122.2' - dark brown (2.5Y 4/3), moderate dense to	-			I 1			N N -
	-			dense, very fine sand, few laminations	=			I 1			X X -
	-			Clayey Sand (SC)				I 1			- 🕅 🕅
1	1			122.2-125.0' - olive brown (2.5Y 4/3), moist, very dense, ve	ry ∥-	V//,	1	1			- 12
1	1			tine sand		V///		0.0			$\bowtie$
1	]			Poorly Graded Sand (SP)				L			
1	4			medium-grained	-		1	1			KA KA –
130	4			Silty Sand (SM)	—-/ F			L			$\otimes$ $\otimes$ -
07.9	-			125 5-126 3' - dark brown (2 5Y 4/3) moderate dense to	-			I 1			X X -
	-	7.3	SN-14	dense, very fine sand, few laminations	-			I 1			
	1			Clayey Sand (SC)				I 1			
				126.3-128.4' - dark grayish brown (2.5Y 4/2), moist to wet,	-			I 1			
	_			dense, fine to medium sand, trace fine subangular gravel, lo	w   _						
	-			plasticity	F	· ·		0.0			
	-			129 4 120 8' olive brown (2 5 4/2) moist loose to medera	to   -	-		0.0			$\bowtie$
135	1			dense fine-grained few clay lenses	"   -						
62.9	1			Poorly Graded Sand (SP)	—/-			I 1			
	136.0			129.8-133.3' - olive brown (2.5 4/3) to light olive brown (2.5	Y []			I 1			
	-			5/4), moist, loose, fine-grained, trace silt	/-			I 1			N N -
	-			No Recovery	-			I 1			X X -
1 .	4			\133.3-136.0'				1			- 18
1 ·	1			Poorly Graded Sand (SP)	-			0.0			
				136.0-139.4' - dark yellowish brown (10YR) and brown (2.3	DY -			I 1			$\boxtimes$ $\square$ -
				$\sim$ medium-grained trace to little silt density increasing at 139	) 2' /=			I 1			
140	4			Sandy Silt (ML)		4		1			M M -
57.9	4			139.4-1442' - olive brown (2.5Y 4/4), dark vellowish browr	ı -			1			- 🕅 🕅
·	1	9.3	SN-15	(oxidation staining), non-moist, very stiff to stiff, very fine sa	nd, -	1	I	1			KI KI -
1	1			plastic	-			L			
1	]				_			L			
1	1				_			L			
1.	4				-			1			- 12
1 .	4				-			1			- 12
145	1			Poorly Graded Sand (SP)	-			L			
52.9	1			144.2-145.3' - dark yellowish brown (10YR) and brown (2.4	оY —	1	ļ	L			
1	146.0			\ 4/3), moisi to wei, moderate dense, line to medium-grained	· /-		l	1			
1	-			No Recovery	—//_			1			
· ·	4			\145.3-146.0'	/ -		1	L			
1 .	4			Poorly Graded Sand (SP)				L			X X -
·	4			146.0-148.8' - brown (10YR 4/3), moist to very moist, loose	, -			1			- 18
1	1			fine to medium-grained sand				1			
1	1				-			1			
150					Γ						
1						1		L			



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# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (437400.6 N, 1202641.2 E)

ELEVATION: 197.9 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Rotary Sonic ProSonic PS600 Sonic Rig, 8" Casing x 7" Core Barrel, 6" casing x 4" Core Barrel

WAIER	<u>R LEVELS</u>	5:		START: 2/1/17 08:35	END	: 2/5	/17 1	3:00		LOGG	ER : R. Clennon
DEPTH	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		U	R	PID EADIN	GS		
	INTERV	AL (FT)				Ē	ē	$\mathbf{r}$			
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,			g Zor	ace	ele	COMMENTS	WELL DIAGRAM
				CONSISTENCY, SOIL STRUCTURE, MINERALOGY		MBC	athin	adsbe	ve H		
			#/TYPE			S	Bre	Ŧ	Abo		
47.9	_			Silty Sand (SM)	-						- 12
	-	6.5	SN-16	(10YR 4/3 (oxidation?) moist dense fine sand little medium	vn / _		•				22 -
-				sand	· / -						
	-			Poorly Graded Sand (SP)							22 -
	-			\dense fine-grained few dense silty sand lenses							- 18
-				No Recovery							
155	-			152.5-156.0	-			0.0			- X X
42.9					_						
	156.0			Poorly Craded Sand (SD)							98 -
	-			156.0-158.7' - dark gravish brown (2.5Y 4/2), very moist, loos	se. –						- 12 12
				fine-grained	_						
	-				-			0.0			- 12 12
				Poorly Graded Sand with Silt (SP-SM)	-		-				
100				158.7-160.1' - dark grayish brown (2.5Y 4/2) ??? to dark gray	/ -	ΠĘ					
37.9	-			(2.5Y 4/3), very moist, moderate dense to loose, fine-grained,	7		-				
	1	87	SN-17	Sandy Silt (MI)							
	-	0.7		160.1-162.3' - olive brown (2.5Y 4/3) with trace dark yellowish	h –						- 🕅 🕅
				brown (10YR 4/4) (oxidation staining), moist, stiff, very fine	-						
				Poorly Graded Sand (SP)							
	-			162.3-164.3' - light olive brown (2.5Y 5/3)/dark yellowish brow	wn -			0.0			- 🕅 🕅
-				(10YR 4/4), very moist, loose, fine-grained sand			·				
165	-			Sandy Sift (ML) 164.3-164.7' - olive brown (2.5Y 4/3) with trace dark vellowisl	h F						× –
52.5	166.0			brown (10YR 4/4) (oxidation staining), moist, stiff, very fine	-						
-				Sand, low plasticity	/[=	ΗTT					X X -
-	-			164.7-166.0'	-						
	1			Poorly Graded Sand (SP)	_/[_		•				
	-			166.0-166.4' - Slough?	_//-			0.0			-
	-			166.4-167.5' - very dark gravish brown (2.5Y 3/1), dry to mois	st.   [						- Pontonito
170				very stiff, trace medium sand, no to low plasticity		민빈	-				Chips —
27.9	-			Silty Sand (SM)	-						-
		9.6	SN-18	dense. very fine to fine sand	-						지 [ ]
	-			Poorly Graded Sand with Silt (SP-SM)							김 김 -
	1			169.0-170.0' - very dark gray (2.5Y 3/1), very moist to wet,	-			1			20/40 Sand
-				Poorly Graded Sand (SP)			Ì	1			희 [화 ] []
	-			170.0-174.0' - very dark gray (10YR 3/1 to GLEY1 3/N), very	_	777		1			: 특징 -
175	1			\moist to wet, loose, fine-grained, little silt	_/_	<i>[///</i>		1			
22.9	176.0			→ 174.0-175.6' - dark gravish brown (10YR 3/2) transitioning to	- -, c	<i>[]]</i>	4	0.0			
	1/0.0			very dark greenish gray (GLEY1 3/1), moist to damp, very still	ff, //-			1			- E
				Viow plasticity	_//_			1			이름시
	-			175.6-176.0'	-		1	1			· = · · · · ·
	1			Poorly Graded Sand (SP)				0.0			() 특징
-	-			176.0-184.3' - very dark greenish gray (GLEY1 3/1) to greeni	sh		1	1			- 2" -
180	1			fine-grained, gravel size increasing slightly with depth	-			1			Schedule -
						ľ	1	1			



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# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (437400.6 N, 1202641.2 E)

ELEVATION: 197.9 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Rotary Sonic ProSonic PS600 Sonic Rig, 8" Casing x 7" Core Barrel, 6" casing x 4" Core Barrel

WATE	R LEVELS	S :		START : 2/1/17 08:35	END	: 2/5/	17 1	3:00		LOGG	ER : R. Clennon
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		(J)	R	PID EADIN	GS		
1	INTERV	AL (FT)				Ď	ø	<u> </u>			
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		DLIC	ig Zon	ace	ole	COMMENTS	WELL DIAGRAM
				CONSISTENCY, SOIL STRUCTURE, MINERALOGY		MB(	athin	adsp	We H		
			#/TYPE			λS	Bre	He	Abc		
17.9	_				_						80 - 0.010 Slot Scree
	-	10.5	SN-19		-						
	-				-						-
	_				_						9 <b>1</b> 31 -
	-				-						
					_						
185	-			Poorly Graded Sand with Silt (SP-SM)	-	ΠŢ		0.0			-
12.9	-			184.3-185.4' - very dark grayish brown (10YR 3/2), moist,	_						
	186.0				_/_	$\parallel \mid \mid$					
	-			185.4-186.0' - dark gray (10YR 4/1), moist, very stiff, low	/_	H					
	1			\plasticity	_lE						
	]			Silt with Organics (ML/CL)	-	前					-
	-	3.0	SN-20	laminated organics (soil, leaf matter)	-						
	_			Silty Sand (SM)	-1C	-i lii					
190	_			186.5-187.2' - very dark gray (10YR 3/1) to very dark gray							
1.5	191.0			Poorly Graded Sand with Silt (SP-SM)							-
	_			187.2-189.0' - very dark gray (GLEY1 3/N and 10YR 3/1), we	t,  /_						-
	_			loose, very fine sand	_//-	밥					-
	_			189.0-191.0'							-
	_	5.6	SN-21	Poorly Graded Sand with Silt (SP-SM)		前					-
	-			191.0-194.5' - very dark gray (GLEY1 3/N and 10YR 3/1), we	t, –	H i i					-
195_	_			Silt (ML) with Organics (OL)	-						
2.9	196.0			194.5-196.0' - dark gray (10YR 4/1), moist, stiff, somewhat	-						-
				friable, no to low plasticity, sand content and plasticity increas	^ю /_						-
	_			Interbedded Sand and Sandy Silt (ML)	-/ [-	$\approx$		0.0			-
	-			196.0-196.7' - grayish brown (10YR 4/2), wet, stiff, very fine	=	$\widetilde{1}$		0.0			-
	_			Sand, low plasticity	_/[=	민만					-
	-			$\neg$ \196.7-197.6' - wood fragments							-
200_				Interbedded Sand and Sandy Silt (SP/ML) with Organics	-'L						-
-2.1	-			(OL) (OL) 197.6-199.2' - gravish brown (10YR 4/2) wet stiff very fine	IF-						-
	-	7.6	SN-22	sand, low plasticity	-					Note: Set	-
1	_			Silt (ML)	_ _	///	1	I		isolation	_
1	-			brown (10YR 2/2), moist, laminated, friable organics	-	///	1	I		casing/seal at 206', seal at	-
1	1			Sandy Clay (CL)			1	I		198.5-206' bgs	_
1	-			200.2-203.6' - dark gray (2.5Y 4/1), damp to moist, stiff, fine	/-			I			-
205				No Recovery	_/			L			-
-7.1	- 200 0			203.6-206.0'	_			L			_
1	206.0			Interbedded Sand (SP) and Clavev Sand (SC)						Begin drillina 4"	-
1	]			206.0-208.2' - dark gray (10YR 4/1) to dark gray (10YR 3/1),	_			I		x 6" (6" casing,	-
1	-			moist, moderate dense, fine to medium sand	-		1	I		4" core barrel)	-
1	1				_	~~		0.0			-
1	-				-	$\approx$		L			-
210						$\widetilde{\mathcal{H}}$					-



### BORING NUMBER: WI-CV-MW06-M SHEET 8 OF 9

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (437400.6 N, 1202641.2 E)

ELEVATION: 197.9 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Rotary Sonic ProSonic PS600 Sonic Rig, 8" Casing x 7" Core Barrel, 6" casing x 4" Core Barrel

V	VATER	LEVELS	:		START : 2/1/17 08:35	END	: 2/5/	<u>17 1:</u>	3:00		LOGG	ER : R. Clennon
ſ	DEPTH B	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		6	р		28		
							ö	rt				
					SOIL NAME USCS GROUP SYMBOL COLOR		D.	Zone	m		COMMENTS	WELL DIAGRAM
			RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		30L	ing 2	space	Hole	COMMENTO	
				SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		Ν	reath	leads	avoc		
+	10.4			#/TYPE			0 ////	В	<u> </u>	¥		
	-12.1				SIIT WITH OFGANICS (ML/OL)	-	V///					-
	-		10.2	SN-23	(10YR 3/3), dry to moist, friable, moderate stiff, laminated	-		0.0				-
	-				organics (leaf litter, soil/peat)							-
	-				Clayey Sand (SC)	-						-
	-				209.7-216.0' - dark gray (10YR 4/1), moist, dense to very	-						-
	_				dense, very line-grained sand, low plasticity	_						=
						_						_
	215					_			0.0			
	-17.1	216.0				-			0.0			-
	_	2.0.0			Clay (CL)		///					_
	_				216.0-231.4' - dark gray (2.5Y 4/1), moist, stiff, low to mediu	m _	V//					
	_				plasticity, some very fine sand	_	V///					-
	-					-	V///		0.0			_
	_					-	V///					-
						_	V///					_
	220						///					
	-22.1					-	V//					-
	_					_	V//					_
	_					_	V//					_
	_					-	///					-
	-					-	///					-
						_	V//					
						_	///					=
	225						///		0.0			
	-21.1		10.0	011.04		-						-
			19.0	SN-24		_	V///					_
	-					_	V//					-
	-					-	///					-
	-					-	///					-
						_	///					
	220 -					-	V//					_
	-32.1											
						_	///					_
	_				Clayay Sand (SC)		///					_
	_				231 4-235 4' - dark grav (10YR 3/1 to GLEY1 3/N) moist to	-						-
	-				wet, dense, low plasticity	-	V///					-
						_	V///		0.0			
	-					-	V//					_
	235					-	V//					-
	-37.1						///					
	-	236.0				_	///					_
	_				235.4-236.0° - very dark grayish brown (10YR 3/2), damp to	/-	V///		0.0			-
	-				Clav (CL)		V///					-
	_				236.0-241.9' - very dark grayish brown (2.5Y 3/2), moist, stif	f to –	V///					-
					very stiff, low to moderate plasticity	_	V///					_
	_					-	V///					-
	240					-	V///					=
F	2.0											



# 

WI-CV-MW06-M SHEET 9 OF 9

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (437400.6 N, 1202641.2 E)

ELEVATION: 197.9 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Rotary Sonic ProSonic PS600 Sonic Rig, 8" Casing x 7" Core Barrel, 6" casing x 4" Core Barrel

WATER LEVELS :				START : 2/1/17 08:35	END	: 2/5/	17 13	3:00		LOGG	ER : R. Clennon
DEPTH BELOW SURFACE (FT)				SOIL DESCRIPTION		PID READINGS			6		
						ŏ	rti				
1				SOIL NAME, USCS GROUP SYMBOL, COLOR.			Zone	æ	e	COMMENTS	WELL DIAGRAM
		RECOVE		MOISTURE CONTENT, RELATIVE DENSITY OR		BO	thing	Ispac	e Hol		
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYN	Brea	Head	Abovi		
-42.1			#/1175			////	_	_	`		
		10.5	SN-25		_	///					-
	-	10.0	011 20		-	///					-
-	-			Silt (ML)	_						-
				241.9-246.0' - very dark grayish brown (2.5Y 3/2) and dark	_						_
-	-			brown (2.5Y 3/3), dry to moist, stiff, somewhat friable, low plasticity in 244 0-246 0' few organics	_						-
-	-				-						-
245					_						
-47.1	246.0				-						-
	240.0			Clay (CL)		///					-
				246.0-254.1' - dark grayish brown (2.5Y 3/2), moist	_	///					_
	-			(decreasing with depth), very stiff, low plasticity	-	V//					-
-	-				-	V//					-
					_	V//					-
250 -	-				_	///					-
-52.1						///					
		10.5	SN-26		_						-
	-	10.0	011 20		-						-
-					-						-
					_						-
-					-						-
				Silt (ML)		////					-
255				254.1-255.9' - very dark grayish brown (2.5Y 3/2) and very							
-57.1	256.0			dark brown (10YR 2/1), dry, stiff, laminated	-						-
-	200.0			Poorly Graded Sand with Silt (SP-SM) Interbedded with	Silt /_						
				(ML) 255 9-256 0' - very dark grav (10YR 3/1) moist moderate	-						-
				dense to dense, fine-grained sand, trace organics	-						-
				Bottom of Boring at 256.0 ft bgs on 2/5/17 13:00							-
					_						-
					-						-
					_						
					-						-
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1	1										


BORING NUMBER: WI-CV-MW06-S

SHEET 1 OF 5

### SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (437394.5 N, 1202643.6 E)

ELEVATION: 198.0 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : RotarySonic ProSonic PS600 Sonic Rig, 6" Casing x 4" Core Barrel

PROJECT NUMBER:

WATER LEVELS : ---START : 2/7/17 13:30 END LOGGER : R. Clennon DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 198.0 Cleared with vac truck/air knife 0.0-6.0' 5 193.0 6.0 Clayey Sand with Gravel (SC) 6.0-7.5' - dark brown (10YR 3/2) to very dark brown (10YR 0.0 3/3), wet, medium plasticity, fine to medium fine-grained, fine to coarse, subangular gravel Well Graded Sand with Gravel (GW) 7.5-10.6' - dark yellowish brown (10YR 3/4), wet, loose, fine to medium sand, fine to coarse subround to subangular gravel . . 10 . . 188.0 . . • Poorly Graded Sand (SP) 0.0 9.5 SN-1 0.0 10.6-15.5' - dark brown (10YR 3/3), moist, loose, little coarse sand and fine to coarse subround gravel 15 183.0 16.0 No Recovery . . 15.5-16.0' Gravel (GW) with Sand 0.0 16.0-16.8' - dark grayish brown (10YR 4/2), wet, loose, fine to coarse round to subround gravel, medium strength Poorly to Moderate Organic Sand with Gravel (SP) 16.8-23.2' - dark gray (10YR 4/2), moist, loose, fine to medium sand, fine to coarse gravel 20 0.0  $178\overline{0}$ 7.2 SN-2 No Recovery 23.2-26.0' 25 173.0 26.0 Poorly Graded Gravel with Sand (GW) 26.0-30.4' - dark gravish brown (10YR 4/2), wet, loose, fine to . . coarse subrounded to subangular gravel, fine to coarse sand . . ••• 30



BORING NUMBER: WI-CV-MW06-S

SHEET 2 OF 5

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : Coupeville, WA (437394.5 N, 1202643.6 E)

### ELEVATION: 198.0 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotarySonic ProSonic PS600 Sonic Rig, 6" Casing x 4" Core Barrel

WAIE	<u>R LEVELS</u>	5:		START: 2/7/17 13:30 E	ND :					LOGG	ER : R. Clennon
DEPT	H BELOW S	URFACE	(FT)	SOIL DESCRIPTION		9	R	PID EADIN	GS		
	INTERV	AL (FT)				ĹŎ	e				
		RECOV	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,			noZ ę	ace	e	COMMENTS	WELL DIAGRAM
				MUISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		MBC	athin	adspé	ve Hc		
			SAMPLE #/TYPE			SYI	Bre	He	Abo		
168.	0			Well Graded Sand with Gravel (SW)	_	• •	1	0.0			
	-	7.8	SN-3	30.4-33.8' - dark gravish brown (10YR 4/2), moist, loose, fine to	o –						22 -
				coarse sand, fine to coarse subangular to round gravel	_						
	-				-						-
	_				_						
	_			No Recovery	_			0.0			
35	-			33.8-36.0'	-			0.0			- 18
163.	0_				-						
	36.0			Well Graded Sand with Gravel (SW)							99 -
				36.0-37.3' - dark grayish brown (10YR 4/2), moist, loose, fine to	。						
	_			coarse sand, fine to coarse subangular to round gravel	/-						- 12 12
	-			37.3-40.5' - dark gravish brown (10YR 4/2), moist, loose, fine to	, –						- 🛛 🖓
	_			coarse sand, fine to coarse subangular to round gravel							
40	-				_			0.0			- 🕅 🕅
158.	0_				_						
	-	8.1	SN-4	Well Graded Sand with Gravel (SW)							- 18
	_			coarse sand, fine to coarse subangular to round gravel	7	••					
				Poorly Graded Gravel with Sand (GW)		•••					
	-			41.7-44.1' - dark gravish brown (10YR 4/2), wet, loose, fine to	-	•••					
					_	••					
45	-			No Recovery	I			0.0			- 12 12
153.	0_			44.1-46.0	-						
	46.0			Well Creded Crevel (CW)							X X -
	-			✓ 46.0-46.8' - color variable, wet, fine to coarse subround	-	••					- 🕅 🕅
	_			Well Graded Sand with Gravel (SW)							
	-			46.8-50.4' - brown (10YR 4/3), moist, loose, fine to coarse	-						- 🕅 🕅
	-				_						
50	-				_			0.0			- 🕅 🕅
148.	0_				_						
	_	7.0	SN-5	Poorly Graded Sand with Gravel (SP) 50 4-53 8' - brown (10YR 4/3) moiet loose fine grained sand	_						
	-			little coarse sand, fine to coarse subrounded gravel	_						- X X
	_			-			·				
	-				-			0.0			- X X
	-			No Popovery							
EF	_			53.8-56.0'	_						99 -
143.	0										
	56.0										
	-			Fooriy Graded Sand (SP) 56.0-60.0' - olive brown (10YR 4/3) moist loose fine-grained	-						- 🕅 🕅
				sand, trace to little fine to coarse subangular gravel	-						
	-				_		·				- 🕅 🕅
					-						- 🕅 🕅
	-				_						
60						· · · ·	-				



WI-CV-MW06-S

SHEET 3 OF 5

## SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : Coupeville, WA (437394.5 N, 1202643.6 E)

ELEVATION: 198.0 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotarySonic ProSonic PS600 Sonic Rig, 6" Casing x 4" Core Barrel

WATER	R LEVELS	8 :		START : 2/7/17 13:30	END					LOGO	ER : R. Clennon
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		U	R	PID EADIN	GS		
	INTERV	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		огіс го	ng Zone	ace	łole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Headsp	Above F		
138.0_ - - - - -	-	7.5	SN-6	Poorly Graded Sand with Gravel (SP) 60.0-63.5' - dark grayish brown (2.5Y 4/2), damp to moist, fine-grained, fine to coarse subround to subangular gravel	-						Grout -
65_ 133.0_	66.0			No Recovery 63.5-66.0'	-			0.0			
		9.1	SN-7	Well Graded Sand with Gravel (SW) 66.0-66.3' - very dark grayish brown (10YR 3/2), wet, loose, medium to coarse sand, fine to coarse subangular to subround gravel Poorly Graded Sand (SP) 66.3-75.1' - dark grayish brown (2.5Y 4/2) to olive brown (2.5Y 4/3), moist, loose, fine-grained, trace fine to coarse subangula gravel	r			0.0			
75_ 123.0_ -	76.0			No Recovery 75.1-76.0' Poorly Graded Sand (SP) 76.0-81.5' - dark gravish brown (2.5Y 4/2), moist, loose,				0.0			
- - - 80_ - 118.0_ - -		5.5	SN-8	fine-grained sand, little silt, gravel lens at 80.2 (leaf debris?)				0.0			
85_ 113.0_ - - - - - - - - - - - - - - - - - - -	86.0			Poorly Graded Sand (SP) 86.0-91.9' - dark grayish brown (2.5Y 4/2), moist, loose, fine-grained, little silt				0.0			
90											
							L				



BORING NUMBER: WI-CV-MW06-S

SHEET 4 OF 5

### SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (437394.5 N, 1202643.6 E)

ELEVATION: 198.0 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : RotarySonic ProSonic PS600 Sonic Rig, 6" Casing x 4" Core Barrel

PROJECT NUMBER:

WATER LEVELS : ---START : 2/7/17 13:30 END LOGGER : R. Clennon DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 108.0 5.9 SN-9 No Recovery 91.9-96.0' 95 103.0 96.0 Poorly Graded Sand (SP) 96.0-97.1' - dark grayish brown (2.5Y 4/2), moist, loose, fine-grained, little silt Silty Sand (SM) 0.0 97.1-98.1' - dark gray (10YR 4/1), moist, dense to medium dense, fine grained sand Poorly Graded Sand with Silt (SP-SM) 100 98.1-100.5' - dark grayish brown (2.5Y 4/2), moist, loose to 98.0 medium dense, fine sand Silty Sand (SM) 6.5 SN-10 0.0 100.5-102.5' - dark grayish brown (2.5Y 4/2), moist, moderate dense (dense at 102-102.5'), very fine sand No Recovery 102.5-106.0 105 93.Ū 106.0 0.0 Slough 106.0-106.35' Silty Sand (SM) 106.35-107.8' - dark grayish brown (2.5Y 4/2), moist, dense, very fine grained sand Poorly Graded Sand with Silt (SP-SM) 107.8-110.25' - grayish brown (2.5Y 4/2), moist, loose, 110 fine-grained sand 88.0 Clayey Sand (SC) 8.1 SN-11 110.25-111.4' - grayish brown (2.5Y 5/2), moist, dense, very fine sand, low plasticity Poorly Graded Sand with Silt (SP-SM) 111.4-114.1' - dark grayish brown (10YR 4/2), moist, loose, very fine to fine-grained, few dense/dry silt lense No Recovery 115 114.1-116.0' 83.0 116.0 Clayey Sand (SC) 0.0 116.0-117.6' - light olive brown (2.5Y 5.3), moist, dense, very fine sand, low plasticity Poorly Graded Sand with Silt (SP-SM) 117.6-119.6' - dark grayish brown (2.5Y 4/2), moist, medium dense, fine to very fine sand 120 İΤ



WI-CV-MW06-S

SHEET 5 OF 5

## SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : Coupeville, WA (437394.5 N, 1202643.6 E)

ELEVATION: 198.0 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotarySonic ProSonic PS600 Sonic Rig, 6" Casing x 4" Core Barrel

WATER	R LEVELS	5 :		START : 2/7/17 13:30	END :					LOGG	ER : R. Clennon
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		Ċ	R	PID EADIN	GS		
	INTERVA	AL (FT)				CLO	he				
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		BOLIC	ning Zo	space	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMI	Breath	Head	Above		
78.0 125 73.0	126.0	10.8	SN-12	Silt (ML) 119.6-120.4' - dark brown (2.5Y 4/3), damp to moist, dense, low plasticity Silty Sand (SM) 120.4-123.2' - dark grayish brown (2.5Y 4/2), moist, medium dense, very fine to fine-grained Clayey Sand (SC) 123.2-126.0' - light olive brown (2.5Y 5.3) to dark brown (2.5Y 4/3), moist to wet, dense, very fine sand Clayey Sand (SC)			0.0	0.0			- - - - - - - Chips - - - - - - - -
130_ 68.0	131.0	3.2	SN-13	126.0-127.3' - olive brown (2.5Y 4.3), wet, moderate dense, very fine sand, low to no plasticity <b>Poorly Graded Sand with Clay (SP-SC)</b> 127.3-128.0' - dark grayish brown (2.5Y 4/2), wet, loose to medium dense, medium to coarse grained, nonplastic <b>Clayey Sand (SC)</b> 128.0-129.2' - olive brown (2.5Y 4.3), wet, moderate dense, very fine sand, low to no plasticity <b>No Recovery</b>							<ul> <li>&lt;</li></ul>
135 63.0		10.5	SN-14	No Recovery         129.2-131.0         Clayey Sand (SC)         131.0-132.7' - olive brown (2.5Y 4.3), wet, loose to moderate dense, very fine sand, low plasticity         Poorly Graded Sand (SP)         132.7-140.9' - light olive brown (2.5Y 5/3) and dark yellowish brown (10YR 4/4), very moist to wet, loose to moderate dense, fine grained, little medium and coarse sand, little clay, no plasticity							2" 
	141.0			Sandy Silt (ML) 140.9-141.0' - olive brown (2.5Y 5/3) and dark yellowish brown (10YR 4/4), dry to moist, stiff, nonplastic Bottom of Boring at 141.0 ft bgs on							



BORING NUMBER:

WI-CV-MW07-M SHEET 1 OF 8

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : (441202.3 N, 1200339.0 E)

ELEVATION: 199.6 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER	LEVELS	:		START: 1/18/17 13:30	END	: 1/2:	3/201	1		LUGG	ER : G. Warren
DEPTH E	BELOW SU	JRFACE (	FT)	SOIL DESCRIPTION				PID			
						Ö	R	ADING			
		ль (г I)				Ъ	one				WELL DIAGRAM
		RECOVE	RY (FT)	SUIL NAME, USUS GROUP SYMBOL, CULOR, MOISTURE CONTENT, RELATIVE DENSITY OR		5	Z BL	ace	lole	COMMENTS	
		1		CONSISTENCY SOIL STRUCTURE MINERALOGY		₽	athir	dsb	е н		
			SAMPLE #/TYDE			λ	Bre	Hea	Abov		
100.6			#/ITPE	No Decovery		•/			`	Design 14:20	
199.0					-					Begin ~ 14:30	-
-				0.0-10.0	-						_
-					-						-
_					-						-
-					-						-
-					-						-
-					-						
_					-						
5					_						
194.6					_	1					
_					_						
_					_					Sample fell out	
_					_						_
_					_						
-					_						
_					-						
_					-						
10 -	10.0				_						-
189.6	10.0			Wall Graded Sand (SW)				0.1			
103.0				10.0.22.6' very dark brown (7.5VP 2.5/1) moist fine to	-			0.1			-
_				coarse round gravel 4" minus mixed lithology	-						-
-				coarse, round graver, + minds, mixed innology	-						-
-			<u></u>		-						
_		5.0	SN-1		-		0.0				-
-					-						-
_					_						
_					_						
15	15.0										
184.6				<ul> <li>continued Well Graded Sand (SW)</li> </ul>	_			0.0			
					_						
_					_						_
_					_						
-		4.0	SN-2		_						
_					_		0.0				_
-					-						-
-					-						-
20 -	20.0				-						-
1796	20.0			- trace clay at 20-21'				0.0			
					-						
-					-						
					-						
		55	SN 2		-						
_		5.5	5IN-3	Well Graded Sand with Silt (SW-SM)		00°4	0.0				
				22.6-24.6' - dark gravish brown (10YR 4/2), dry, fine to	_	°¦•¦°†3					
_				coarse sand	_						
a											
25	25.0			Poorly Graded Sand (SP)							
174.0				24.6-28.0' - dark grayish brown (10YR 4/2), dry, fine to	-			0.3			-
				medium-grained, increasing fine gravels	-						-
-					-						
-					-						
-		4.0	SN-4		-		0.0				-
				Cemented Well Graded Sand (SW)		l · · ·					
-				28.0-28.6'	_						
				Well Graded Sand with Gravel (SW)							
30				28.6-31.1' - dark gray brown (10YR 4/2) dry fine to coarse	-						



BORING NUMBER:

WI-CV-MW07-M SHEET 2 OF 8

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : (441202.3 N, 1200339.0 E)

ELEVATION: 199.6 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Terrasonic Track Rig

WATER LEVELS : DEPTH BELOW SURFACE (FT)			START : 1/18/17 13:30	END	: 1/2	3/201	7		LOGG	ER : G. Warren	
DEPTH E	INTERVAL (FT)			SOIL DESCRIPTION		(ľ)	R	PID EADIN	GS		
	INTERVA	L (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,			g Zone	ace	ole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	MOISTORE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMBO	Breathin	Headsp	Above Ho		
169.6_ 	30.0			Poorly Graded Sand (SP) 31.1-33.0' - dark gravish brown (10YR 4/2), dry, fine to				0.1			-
- - - 35_	35.0	4.5	SN-5	medium-grained         Silty Sand with Gravel (SM)         33.0-52.0' - grayish brown (10YR 5/2), dry, cemented layers         (stiff), 10-20% silt, fine to medium sand, fine round gravels	- - - -		0.0				
164.6 		3.2	SN-6							Wet from drilling mud at 35-38'	
40 159.6_ - - - -	40.0	2.3	SN-7	- continued Silty Sand with Gravel (SM), weakly cemented							
45_ 154.6_ - - - -	45.0									Some fell out Stop at 45' 16:45	
50 149.6_ 	50.0	5.0	SN-8		- - - -			0.2			-    
	53.5			Transitional contact through very fine sand to <b>Sandy Silt (M</b> 52.0-55.11' - dark gray brown (10YR 4/2), dry, stiff, 30% ver fine sand, weakly cemented	<b>L)</b> _ y _ - -		0.0				
144.6		4.3	SN-9	<b>Poorly Graded Sand (SP)</b> 55.11-60.0' - dark grayish brown (10YR 4/2), dry, loose, fine							
60_											



BORING NUMBER: WI-CV-MW07-M

SHEET 3 OF 8

### SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : (441202.3 N, 1200339.0 E)

ELEVATION: 199.6 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Terrasonic Track Rig

WATER LEVELS : ---START : 1/18/17 13:30 END: 1/23/2017 LOGGER : G. Warren DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing Headsp CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 139.6 Silty Sand (SM) 60.0 60.0-62.7' - dark gray brown (10YR 4/2), moist, very stiff, very fine 4.1 SN-10 0.0 Poorly Graded Sand (SP) 62.7-70.0' - dark grayish brown (10YR 3/2) with organic peat 1" layer at 63.2', occasional fine gravel lenses and thin silt layers that are weakly cemented 65 65.0 134.6 0.3 SN-11 3.6 0.0 70.0 70 129.6 0.3 Silty Sand with Gravel (SM) 70.0-72.6' - moist, fine to coarse matrix 3.4 SN-12 Poorly Graded Sand (SP) 0.0 72.6-77.9' - dark grayish brown (10YR 4/2), dry, loose, fine-grained 75 75.0 124.6 0.4 5.8 SN-13 0.0 Interbedded Silt/Clay (CL-ML) Layers in Fine Sand (SP) 77.9-81.2' - moist, hard (weakly cemented), sandy 80 80.0 0.3 119.6 Poorly Graded Sand (SP) 81.2-95.0' - dark grayish brown (10YR 4/2), dry, loose but cemented layers from 83.7-85.2', fine-grained 4.3 SN-14 0.0 85 85.0 114.6 0.4 4.3 SN-15 Bentonite 0.0 Chips 90



PROJECT NUMBER:

WI-CV-MW07-M SHEET 4 OF 8

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : (441202.3 N, 1200339.0 E)

ELEVATION: 199.6 ft

DRILLING CONTRACTOR : Cascade Drilling

WATE	R LEVELS	S :		START : 1/18/17 13:30	END	1/2	3/201	7		LOGG	ER : G. Warren
DEPTH	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		U	R	PID EADIN	GS		
	INTERV	AL (FT)	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		опс го	ig Zone	ace	ole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB0	Breathin	Headsp	Above H		
109.6	90.0 - - - - - -	4.2	SN-16	- continued <b>Poorly Graded Sand (SP)</b> like above, a few thin silty laminations at 90-91'	-		0.0	0.2			
95_ 104.6	95.0 - - - -	4.0	SN-17	95.0-96.0' - trace Silt in <b>Poorly Graded Sand (SP)</b> , very weakly cemented	-		0.0	0.3			
100_ 99.6	- - - - - - -				-			0.4		14:55	
105_	- - - - - - - - - - - - - - - - - - -	3.1	SN-18	Silty Sand (SM) 102.5-105.7' - very dark grayish brown, dry, stiff to hard, very fine sand/silt mix	-		0.0				
94.6		5.3	SN-19	Poorly Graded Sand (SP) 105.7-115.0' - dark grayish brown (10YR 4/2), dry, fine-grained, below 108' has weakly cemented silt layers within poorly graded sand	- - 1 - - -						
110 <u>89.6</u>	- <u>110.0</u> 	2.3	SN-20							Stop at 110' for day Resume 12:00 on 1/20/17	
84.ē	- - - - - - -	5.0	SN-21	Poorly Graded Sand with Silt (SP-SM) 115.0-118.3' - brown (10YR 4/3), very fine-grained Poorly Graded Sand (SP) 118.3-140.0' - dark grayish brown (10YR 4/2), dry, fine-graine	- - - - - - - - - - - - - - - - - - -		0.0	0.0			
								I			



BORING NUMBER:

WI-CV-MW07-M SHEET 5 OF 8

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : (441202.3 N, 1200339.0 E)

ELEVATION: 199.6 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER	LEVELS	:		START : 1/18/17 13:30	END	: 1/2:	3/201	7		LOGG	ER : G. Warren
DEPTH E	BELOW SI	JRFACE (	FT)	SOIL DESCRIPTION			Р	PID	~~		
		L (ET)				ö			33		
				SOIL NAME LISCS GROUP SYMBOL, COLOR		2	Zone			COMMENTS	WELL DIAGRAM
		RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		ğ	ing .	space	Ноњ	COMMENTO	
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		Μ	reath	leads	Dove		
			#/TYPE			Ś	ā	Т	At		
79.6	120.0				_						-
-					-					Coro barrol	-
_					-	t E				empty sample	
		0.0	SNI 22		_					fell out bridge at	
_		0.0	311-22		_					45' in hole, odd.	
_					-					drill down and try	-
-					-					get soil tag BOH	-
125	125.0				-					at 131.4'	-
74.6				<ul> <li>very fine Sand/Silt on bit (SM-ML)</li> </ul>	_						
_					_						-
_					-						-
-					-						-
		0.0	SN-23								
					_						
_					_						-
130	130.0				-						-
69.6					_						
_					_						_
-					_						-
-					-	E P					-
_		0.0	SN-24		_						-
					_						
_					-						-
135	135.0				-						=
64.6				- very fine Sand/Silt on bit (SM-ML)							
					_						-
-					-					l ag bottom at	-
-			011.07		-					where ?? is	-
		0.0	SN-25		_						
_					_						-
_					-						-
140 -	140.0				-						-
59.6				Silty Sand (SM) to Sandy Silt (ML)	_						
_				140-0-150.0' - interbedded gray (GLEY1 4/N), moist, stiff, very	У_						-
_				ine and line sand	-						-
_		10			_						-
		4.0	5IN-20		_						
_					_						-
_					-						-
145	145.0				-						
54.6					_			0.0		Stop at 145' for	
_					_					day, redrill 140-	
-					-					100	
_		5.0	011.07		-						
		0.C	JIN-21		_		0.0				
_				- tew lenses of Clay (CL), gray, medium plasticity, binds core	_						
_					_						
150											-



BORING NUMBER:

WI-CV-MW07-M SHEET 6 OF 8

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : (441202.3 N, 1200339.0 E)

ELEVATION: 199.6 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER	LEVELS	:		START : 1/18/17 13:30	END	: 1/23	3/201	7		LOGG	ER : G. Warren
DEPTH B	BELOW SU	JRFACE (	FT)	SOIL DESCRIPTION		U	R	PID EADING	GS		
	INTERVA	L (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT RELATIVE DENSITY OR		OLIC LO	ng Zone	Jace	łole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathir	Headsp	Above H		
49.6 _ - - - - - - - - - - - - - - - - - - -	150.0	3.1	SN-28	Lean Clay (CL) 150.0-160.5' - dark greenish gray (GLEY1 4/1), moist, very stiff/hard, cohesive, medium plasticity, silty, very fine sandy intervals but no apparent stratification, couple of 3/4" - minus round pebbles	- - - - - - - -		0.0	0.0		Doing 5' runs	
44.6 	160.0	5.4	SN-29							Ether till or ice margin lake, very "compact", no stratification	
39.6 _ - - - - - - - - - - -	165.0	5.7	SN-30	Elastic Silt (MH) 160.5-161.5' - 1-foot "bed" Continued Lean Clay (CL), like above 161.5-165.0'			0.0	0.0			
34.6 _ 	105.0	0.0	SN-31	<b>No Recovery</b> 165.0-170.0' - driller said soft/easy drilling like silt							
170 29.6 _ - - - - - - - - - - - - - - - - - - -	170.0	7.1	SN-32	Clay (CL) 170.0-178.0' - dark gray (G14/N ), moist, very stiff to hard, plastic, non-stratified			0.0	0.0		Run 33 = 170- 177'	
	177.0	2.5	SN-33	contains 1-2" round gravel at 177.5' Silty Sand (SM) to Clayey Sand (SC) 178.0-183.8' - dark gray (GLEY1 4/N), wet, dense, fine-grained, a few pieces of round gravel	-						<20/40 Sanā



BORING NUMBER:

WI-CV-MW07-M SHEET 7 OF 8

### SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : (441202.3 N, 1200339.0 E)

ELEVATION: 199.6 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER	LEVELS	:		START : 1/18/17 13:30	END	: 1/2	3/201	7		LOGG	ER : G. Warren
DEPTH E	TH BELOW SURFACE (FT) INTERVAL (FT) RECOVERY (FT)			SOIL DESCRIPTION		Ŋ	R	PID EADIN	GS		
	INTERVA	L (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR			ing Zone	pace	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above I		
19.6 _ - - - - - - - - - - - - - - - - - - -	180.0	5.0	SN-34	Silt (ML) 183.8-191.1' - dark gray (GLEY1 4/N), moist, low plasticity, fo	- - - - - - - - - - - - -		· · · · · · · · · · · · · · · · · · ·			Stiff /hard to advance in (FILL) Stop at 17:31 for day 8" casing to 170' 5' x 8" bentonite seal - 170-175' Drill 6" x 4" from 170	2" 2" Schedule - 80 - 0.010 Slot Screen
14.6 _ _ _ _ _ _ _ _ _ _ _ 	190.0	5.2	SN-35	organic clay lenses at 180	-					Driller noted easier drilling 187'	
9.6 _ - - - - - - - - - - - - - - - - - - -	195.0	5.1	SN-36	Lean Clay (CL) 191.1-203.0' - dark gray (GLEY1 4/N), moist, very stiff to han medium plasticity, "silty clay" zones with weak dilatancy, like "elastic" silt	-      						
4.6	200.0	5.2	SN-37				0.0	0.0			
-0.4	205.0	5.2	SN-38	Silt (ML) 203.0-211.6' - dark gray (GLEY1 4/N), moist, nonplastic to lo plasticity zones of silt/clay, dilatant, "elastic"			0.0	0.0			
-5.4 _ - - - - - - - - - - - - - - - - - - -		5.2	SN-39				0.0	0.0			
							1				



BORING NUMBER: WI-CV-MW07-M

SHEET 8 OF 8

### SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : (441202.3 N, 1200339.0 E)

ELEVATION: 199.6 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Terrasonic Track Rig

WATER LEVELS : ---START : 1/18/17 13:30 END : 1/23/2017 LOGGER : G. Warren DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Hole MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY Breathing 7 Headsp Above I SAMPLE #/TYPE -10.4 210.0 Grades to Lean Clay (CL) 211.6-215.0' - dark gray (GLEY1 4/N), moist, very stiff to hard, 5.2 SN-40 medium to low plasticity 215 215.0 -15.4 Sandy Silt (ML) 215.0-216.5 Claystone 216.5-219.3' - brown 5.4 SN-41 Sandy Silt to Silty Sand (ML-SM) 220 220.0 219.3-221.5' - wet -20.4 Claystone 221.5-225.0' - very weak/friable SN-42 5.2 225 225.0 -25.4 Bottom of Boring at 225.0 ft bgs on 1/23/2017

### BORING NUMBER: WI-CV-MW07-S

SHEET 1 OF 5

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : (441209.8 N, 1200340.5 E)

PROJECT NUMBER:

ELEVATION: 200.0 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT :

WATER	LEVELS	:		START : 1/25/2017	END	: 1/29	9/201	7		LOGG	ER : G. Warren
DEPTH B	BELOW S	JRFACE (	FT)	SOIL DESCRIPTION			D		28		
						Ö	R		35		
	INTERV	AL (FI)				Ū	one			COMMENTS	WELL DIAGRAM
		RECOVE	ERY (FT)	MOISTURE CONTENT. RELATIVE DENSITY OR		ğ	z gu	pace	Pole		
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		Ř	eath	eads	ove		
			#/TYPE			ŝ	В	Í	Ab		
200.0					_						- 18
-					-	-					- 12 12
-					-						- 12
-					-						
_					_						
-					-	-					99 -
-					-	-					
5 -	5.0				-						
195.0				Well-Graded Sand with Gravel (SW)				0.2			
-				5.0-14.5' - dark yellow brown (10YR 3/4) to dark gray brown	-						N N -
-				(10YR 3/4), dry, dense, round gravel 3", fine to coarse sand	-	-					X X -
-					-	-					
-					-						
_					_						
-					-						XX -
10 -					-	-					- 12 12
190.0		8.5	SN-1			1	0				
					_						
-					_	-					- 12 1
-					-						K K -
-					-	-					9 9 -
_					_						
_					_						
15	15.0			Deat Seem		al bu					X X -
185 0	15.0			14 5-14 6'	-			0.2			
				Well Graded Sand with Silt and Gravel (SW-SM)	/ -						
_				14.6-25.0' - dark brown (10YR 4/1), dry, dense, fine to coarse	e _						
-				sand, 1-3" round gravel lenses of cemented material (SM-SV	V) _						
-		5.2	SN-2		-		0				- 🕅 🕅
-					-						
					_	۱۰¦۰					$\bigotimes \bigotimes$
					_						X X -
20	20.0									Drilling dry clow	
100.0					-	• • • •				cuttings hot	
-					-					g-,	
_					_	, li li					
-		4.3	SN-3		-						K K -
-					-						- 12 12
-					-	0					
_					_						
25	25.0							4.5			
175.0				Continued Well Graded Sand with Silt and Gravel (SW-Sil	VI), _			1.5			- 18
-				25 0-30 0'	-						
					_						
-		50	SN-4		_						
-					-		U				- 14 14
-					-						
-					-						
30											$\bowtie$
						1					
						1					1

### BORING NUMBER: WI-CV-MW07-S

SHEET 2 OF 5

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : (441209.8 N, 1200340.5 E)

PROJECT NUMBER:

ELEVATION: 200.0 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT :

WATEF	R LEVELS	S :		START : 1/25/2017	END	: 1/29	9/201	7		LOGO	ER : G. Warren
DEPTH	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		U	R	PID EADING	GS		
	INTERV	AL (FT)	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		OLIC LO	ng Zone	pace	lole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above H		
170.0 	30.0			Continued <b>Well Graded Sand with Silt and Gravel (SW-SN</b> shattered by drilling 30.0-35.0'	<b>I)</b> ,	+ + + + + + + + + + + + + + + + + + +					
165 <u>0</u>	40.0	7.6	SN-5	Well Graded Sand with Gravel (SW) 35.0-40.0 - very dark grayish brown (10YR 3/2), dry, dense,20% small gravel round, fine sand		F.F.T.		0.0			
45		9.9	SN-6	Poorly Graded Sand with Silt and Gravel (SP-SM) 40.0-50.0' - dark grayish brown (10YR 4/2), dry, stiff silt/clay lenses			0.0	0.8			
50	50.0			- pulverized more fine sand at 48' Poorly Graded Sand (SP)	-					Fast drill 50-55'	
55_145.0		5.0	SN-7	50.0-54.0' - dark grayish brown (10YR 4/2), wet from drill water, loose, fine-grained Silty Sand (SM) 54.0-59.0' - very dark brown (10YR 2/2), slightly moist, fine, organic silt, gravel lens Poorly Graded Sand (SP) 50.0.451 - gravish brown (10YR 5/2), day fire series in				0.4		50-55' recovered 1.5' loose sand	
60				59.0-64.5' - grayish brown (10YR 5/2), dry, fine-grained							

### BORING NUMBER: WI-CV-MW07-S

SHEET 3 OF 5

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : (441209.8 N, 1200340.5 E)

PROJECT NUMBER:

ELEVATION : 200.0 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT :

WATER LEVELS :			START : 1/25/2017	END	1/29	9/201	7		LOGG	ER : G. Warren	
DEPTH	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		U	R	PID EADIN	GS		
	INTERV	AL (FT)				IC LO	Zone		_	COMMENTS	WELL DIAGRAM
		RECOVI	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		MBOL	eathing Z	eadspace	ove Hole	CONNENTS	
140.0	60.0		#/TYPE			Ś	B	т 0.2	Α¢	1.5' recovery in	
65_ 135.0		7.3	SN-8	<b>Silty Sand with Silt Lenses (SM-ML)</b> 64.5-67.0' - dark grayish brown (10YR 3/2), very fine sand			0			1st 5 feet	- Bentonite - Grout - - - - - - - -
70_	70.0			Poorly Graded Sand (SP) 67.0-73.8' - very dark grayish brown (10YR 3/2), dry, loose, fine-grained				0.2			
130.0		3.1	SN-9	Wall Graded Sand with Silt and Gravel (SIM SM)				0.6			
75_ 125.0	75.0			73.8-75.0' - dark yellowish brown (10YR 3/4), dry, fine to coarse, fine gravel <b>Poorly Graded Sand with Silt (SP-SM)</b> 75.0-81.0' - dark gray brown (10YR 4/2), dry, fine-grained, silt lenses							
80 120.0		9.7	SN-10	81.0-82.0' - Clay Lenses <b>Poorly Graded Sand with Silt (SP-SM)</b> 82.0-93.0' - like above							
85_ 115.0	85.0			- continued <b>Poorly Graded Sand (SP)</b>						Stop at 85' for day, run 8" casing to 10' Resume 1/26/17 at 10:30, no recovery 95-90'	

### BORING NUMBER: WI-CV-MW07-S

SHEET 4 OF 5

### SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : (441209.8 N, 1200340.5 E)

PROJECT NUMBER:

ELEVATION: 200.0 ft

### DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT :

				START : 1/25/2017	END	: 1/29	<u>)/201</u>	7		LOGO	ER : G. Warren
DEPTH E	BELOW SI	JRFACE (	,FT)	SOIL DESCRIPTION		υ	RI	PID EADINC	3S		
	INTERVA	L (FT)	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		SOLIC LO	ng Zone	pace	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above I		
110.0 - - - - - - - - - - - - - - - - - -	95.0	3.5	SN-11	Cemented Silty Sand (SM) 93.0-95.0' - very dark grayish brown (10YR 3/2), dry, hard, very fine sand							
105.0 	30.0	5.0	SN-12	Silty Sand (SM) 95.0-99.5' - very dark grayish brown (10YR 3/2), dry, fine san very weakly cemented	ıd,		0	0.2			
100_ 100.0_ - - - - - - - - - - - - - - - - - - -	100.0	3.0	SN-13	99.5-108.0' - very dark gray (10YR 3/1), dry, loose, fine-grained			0	0		No recovery in upper 5'	
	110.0			Silty Sand (SM) 108.0-115.0' - dark gray brown (10YR 4/2), dry, medium dense, weakly cemented zones, trace organics	- - - - - - - -			0.2			
	115.0	0.0	SN-14							SP??	
85.0 _ - - - - - - - - - - - - - - - - - - -				Poorly Graded Sand (SP) 115.0-116.0' - fine, poorly recovery Sandy Silt (ML) 116.0-122.0' - dark gray (10YR 4/1), wet, very stiff/cohesive, with very fine sandy zones							

### BORING NUMBER: WI-CV-MW07-S

SHEET 5 OF 5

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : (441209.8 N, 1200340.5 E)

PROJECT NUMBER:

ELEVATION: 200.0 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT :

WATER LEVELS :				START : 1/25/2017	END	: 1/2	9/201	7		LOGG	ER : G. Warren
DEPTH E	BELOW S	JRFACE (	FT)	SOIL DESCRIPTION		U	R	PID EADIN	SS		
	INTERVA	NL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		BOLIC LO	hing Zone	Ispace	e Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYM	Breat	Head	Above		
80.0 - - - - - - - - - - - - 	405.0	10.0	SN-15	Poorly Graded Sand (SP) 122.0-123.7' - brown (10YR 4/3), dry, fine-grained Sandy Silt (ML) 123.7-130.0' - dark gray (10YR 4/1), firm to stiff, very fine san	- - - - - - - - -		- - -	0			
125 75.0   120	125.0	1.0	SN-16		- - - - - -					Sand?	<ul> <li>← Bentonite Chips</li> <li>←</li> <li>20/40 Sand</li> </ul>
130 70.0 _ - - - - -	130.0			Sand (SP) with Silt Sand Zones (SM) 130.0-136.5' - brown (10YR 4/3), wet, dense, fine-grained 133.0-134.0' - wet sand			· · · · · · · · · · · · · · · · · · ·	0.0			
135 65.0     140	140.0	10.0	SN-17	Sand-Silt (SM) 136.5-138.0' - sandy silt lens at 138' Poorly Graded Sand (SP) 138.0-145.0' - gray, wet, loose, fine-grained							2" Schedule - 80 - 0.010 Slot Screen
60.0 _ - - - - - - - - - - - - - - - - - - -	145.0	0.0	SN-18								
55.0				Bottom of Boring at 145.0 ft bgs on 1/29/2017						T.D. = 145' 1/29/17	



WI-CV-MW08-M SHEET 1 OF 8

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : Coupeville, WA (441676.5 N, 1202808.8 E)

ELEVATION: 205.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotoSonic 600C Full-sized Track Rig, 8/6", Casing 2/4" Barrel

WATEF				START : 2/8/2017	END	2/12	2/17	10:00	)	LOGO	ER : E. Bilyeu
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		υ	RI	PID EADIN	GS		
	INTERV	AL (FT)				СГО	one				
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		BOLIG	ing Zo	space	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above		
205.2	0.0			Cleared 5' with vac truck prior to drilling, no description 0.0-5.0'							
-					-						-
		2.0	SN-1							8" casing	
5 200.2	-			Well Graded Sand (SW) 5.0-7.0' - (2.5Y 4/1), dry, loose, 100% subrounded fine to cors	e _					7' barrel No fluid/mud	
-	7.0			sand, trace fines and gravel	_			0.0			
-	-			No Recovery 7.0-14.0'	_						- 🕅 🕅
-	-				-						× × -
10	-				-						
195.2	-				-			0.0			
-	-				-						
-	-	3.0	SN-2		_						- 🕅 🕅
-					-						
-					_						
15	-			Well Graded Sand (SW) 14.0-17.0' - (2.5Y 4/1), dry, loose, 100% subrounded fine to	_						
190.2	-			coarse sand, trace fines, 5% fine subrounded gravel	_			0.0			- 🕅 🕅
-	17.0				-						× × -
-	17.0			Well Graded Sand (SW)							
-	-			17.0-20.0' - (2.5Y 4/1), dry, loose, 100% subrounded fine to coarse sand, trace fines, 5% fine subrounded gravel	-						
-	-				_						- X X
20_	-			Departs Oracled Construction Site and Oracial (SD SM)				0.0			
105.2	-			20.0-27.0' - (2.5Y 4/1), dry, loose, 70% fine subrounded sand	, _			0.0			
-	-	10.0	CN 2	gravel, trace cobbles	_	뱞					- 12
-	_	10.0	5IN-3		-						× ×
-	1				-		1				
	1				_						
25 180.2	-				_			0.0			
-	1				-						
	27.0				_						
-	-			Well Graded Sand (SW) 27.0-28.0' - (2.5Y 4/1), dry, loose. 100% subrounded fine to	_						- 🛛 🖓
-	]			coarse sand, trace fines, 5% fine subrounded gravel	_/-		1				
	1				-						
30											



WI-CV-MW08-M

SHEET 2 OF 8

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (441676.5 N, 1202808.8 E)

ELEVATION: 205.2 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : RotoSonic 600C Full-sized Track Rig, 8/6", Casing 2/4" Barrel

PROJECT NUMBER:

WATER LEVELS : ---START : 2/8/2017 END: 2/12/17 10:00 LOGGER : E. Bilyeu DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPF 175.2 Grades into Silty Sand with Gravel (SM) 28.0-33.0' - (2.5Y 4/1), moist, loose, silty sand fine to coarse subrouned, sand predominately fine, 30% nonplastic fines, 15% fine to coarse gravel 10.0 SN-4 Grades into Poorly Graded Sand (SP) 33.0-36.0' - (2.5Y 4/1), moist, loose, 95% subrounded fine to medium sand, 5% fine subrounded gravel 35 170.2 0.0 Poorly Graded Sand with Silt and Gravel (SP-SM)  $36.0\mathchar`-37.0\mathchar`-$  (2.5Y 4/1), dry, loose, 70% fine subrounded sand, predominately fine, 25% nonplastic fines, 15% fine to coarse 37.0 • gravel, trace cobbles Well Graded Gravel with Silt/Clay 37.0-38.0' - (5Y 5/1), moist, loose, 90% fine to coarse subrounded gravel, 20% unidentifiable plasticity fines 40 Poorly Graded Sand with Silt and Gravel 165.2 0.0 38.0-39.0' - (2.5Y 4/1), 80% fine to coarse subrounded predominately fine sand, 10% nonplastic fines, 10% fine to medium subrounded gravel Well Graded Sand (SW) 10.5 SN-5 39.0-42.0' - (2.5Y 4/1), moist, loose, 95% fine to coarse subrounded sand, 5% fine to coarse subrounded gravel Poorly Graded Sand (SP) 42.0-47.0' - (2.5Y 4/1), moist, loose, 95% fine to medium subrounded sand, 5% fine subrounded gravel 45 160.2 0.0 47.0 No Recovery 47.0-50.0' 50 155.2 0.0 Well Graded Gravel with Sand (GW) 50.0-53.0' - (2.5Y 4/1), moist, loose, 60% fine to coarse subrounded gravel, 40% fine to coarse subrounded sand 7.0 SN-6 Poorly Graded Sand (SP) subrounded sand, 5% fine subrounded gravel 55 150.2 0.0 57.0 Poorly Graded Sand with Gravel (SP) 58.0-61.0' - (2.5Y 4/1), moist, loose, 75% fine to medium subrounded sand, 25% fine to medium subrounded gravel, 60 trace fines, no recovery 57-58'



WI-CV-MW08-M SHEET 3 OF 8

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : Coupeville, WA (441676.5 N, 1202808.8 E)

ELEVATION: 205.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotoSonic 600C Full-sized Track Rig, 8/6", Casing 2/4" Barrel

V	WATER LEVELS : DEPTH BELOW SURFACE (FT)			START : 2/8/2017	END	2/12	2/17	10:00	)	LOGG	ER : E. Bilyeu	
0	DEPTH E	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		ڻ ن	R	PID EADING	GS		
		INTERVA	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		OLIC LC	ng Zone	pace	lole	COMMENTS	WELL DIAGRAM
				SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above I		
	145.2_             	67.0	4.0	SN-7	<ul> <li>Poorly Graded Sand (SP) 61.0-62.0' - (2.5Y 4/1), moist, loose, 95% fine to medium subrounded sand, 5% fine subrounded gravel</li> <li>Poorly Graded Sand with Gravel (SP) 62.0-66.0' - (2.5Y 4/1), moist, loose, 75% fine to medium subrounded sand, 25% fine to medium subrounded gravel, trace fines, no recovery 62-63'</li> <li>Poorly Graded Sand (SP) 66.0-67.0' - (2.5Y 4/1), moist, loose, 95% fine to medium subrounded sand, 5% fine subrounded gravel</li> <li>No Recovery 67.0-68.0'</li> <li>Poorly Graded Sand with Gravel (SP) 68.0-70.0' - (2.5Y 4/1), moist, loose, 85% fine to medium predominately fine subrounded sand, 15% fine to coarse subrounded gravel, trace cobbles</li> <li>Well Graded Sand with Gravel (SW) 70.0-77.0' - (2.5Y 4/1), moist, loose, 85% fine to coarse subrounded gravel, trace cobbles</li> </ul>				0.0			
	- - - 75 130.2_ - -	77.0			CODDIES and Tines				0.0		Beain drilling	
			8.5	SN-9	Well Graded Sand with Gravel (SW) 78.5-87.0' - (2.5Y 4/1), moist, loose, 85% fine to coarse subrounded sand, 15% fine to coarse subrounded gravel, trac cobbles and fines	×			0.0		with fluid/mud 2/9/17	
	120.2_             	87.0			<b>No Recovery</b> 87.0-89.5'				0.0			



WI-CV-MW08-M SHEET 4 OF 8

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : Coupeville, WA (441676.5 N, 1202808.8 E)

ELEVATION: 205.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotoSonic 600C Full-sized Track Rig, 8/6", Casing 2/4" Barrel

WAT	WATER LEVELS : DEPTH BELOW SURFACE (FT)				START : 2/8/2017	END	2/12	2/17	10:00	)	LOGG	ER : E. Bilyeu
DEP	TH E	BELOW SI	JRFACE (	FT)	SOIL DESCRIPTION		ڻ.	R	PID EADING	GS		
		INTERVA	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT. RELATIVE DENSITY OR		SOLIC LO	ing Zone	pace	Hole	COMMENTS	WELL DIAGRAM
				SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above		
11:	5.2_ _ _		7.5	SN-10	Poorly Graded Sand (SP) 89.5-92.5' - (2.5Y 4/1), wet from drilling, loose, 95% fine subrounded sand, 5% nonplastic fines				0.0			
0					Poorly Graded Sand (SP) 92.5-95.0' - (2.5Y 4/1), moist, loose, 95% medium subrounded sand, 5% silt and gravel	1 _ _ _						
110	).2_ 	97.0			Well Graded Sand with Gravel (SW) 95.0-97.0' - (2.5Y 4/1), loose, moist, 85% fine to coarse subrounded sand, 15% fine to coarse subrounded gravel, trac cobbles	e _			0.0			
	-				No Recovery 97.0-98.5'							
10 105	- 00 5.2 - - - - -		8.5	SN-11	Well Graded Gravel with Sand (GW) 98.5-100.0' - (2.5Y 4/1), weet from drilling, loose, 60% fine to coarse subrounded gravel, 40% fine to predominately medium to coarse subrounded sand, trace fine <b>Poorly Graded Sand (SP)</b> 100.0-107.0' - (2.5Y 4/1), loose, 95% fine to medium subrounded sand, 5% fines and fine to medium subrounded gravel, fine to coarse subrounded gravel lenses ranging to a few inches at 102.5' and 105.5', sand grades finer downward into a fine to medium medium dense sand				0.0			
10 100	)5 ).2	107.0							0.0			
11 95	0  2  2  1  1		10.0	SN-12	<ul> <li>Poorly Graded Sand (SP)</li> <li>107.0-109.0' - (2.5Y 4/1), loose, 95% fine to medium subrounded sand, 5% fines and fine to medium subrounded gravel, sand grades finer down</li> <li>Silty/Clayey Sand (SM/SC)</li> <li>109.0-111.0' - (2.5Y 4/2), moist, medium dense, 80% fine subrounded 1-2 mm layered sands, 15% nonplastic fines in large to medium sands and lenses of clay (GLEY 4/N), stiff, medium plasticity, medium dry strength at 110.5' bgs</li> <li>Poorly Graded Sand (SP)</li> <li>111.0-115.0' - (2.5Y 4/1), moist, medium dense, dry, fine subrounded layered sand, 5% fines</li> </ul>				0.0			
11 90	5  .2         	117.0			Poorly Graded Sand (SP) 115.0-117.0' - (2.5Y 4/1), moist, medium dense, dry, fine subrounded layered sand, 5% fines, oxidized layering No Recovery 117.0-127.0'				0.0			
12	20					_						



WI-CV-MW08-M

SHEET 5 OF 8

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (441676.5 N, 1202808.8 E)

ELEVATION: 205.2 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : RotoSonic 600C Full-sized Track Rig, 8/6", Casing 2/4" Barrel

PROJECT NUMBER:

WATER LEVELS : ---START : 2/8/2017 END: 2/12/17 10:00 LOGGER : E. Bilyeu DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS Log INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 85.2 0.0 SN-13 125 80.2 127.0 2/10/17 0900 Lean Clay/Silt (CL/ML) 127.0-129.5' - (GLEY 4/N), wet, very stiff, 100% medium plasticity fines, low to none dilatancy, varying low to medium dry strengths Silty Sand (SM) 130 75.2 129.5-132.0' - (2.5Y 4/2), wet, medium dense, 85% fine 0.0 Set 8" isolation casing at 132' subrounded sand, 15% nonplasticity fines bgs Advancing with 11.0 SN-14 6" casing and 4" Silt (ML) 132.0-135.5' - (GLEY 4/N), wet, stiff, 100% nonplastic to low barrel plasticity fines, no dry strength Bentonite to 130' Hydrate for 1 hour 135 0.0 70.2 Sandy Silt (ML) 35.5-137.0' - GLEY 4/N, wet, stiff, 70% nonplastic fines, 30% 137.0 fine subrounded sand No Recovery 137.0-138' Poorly Graded Sand with Silt (SP-SM) 138.0-140.0' - (2.5Y 4/2), wet, medium dense, 90% fine subrounded sand, 10% nonplastic fines 140 0.0 Poorly Graded Sand (SP)  $65\bar{2}$ 140.0-147.0' - wet, dense, 95% fine subrounded sand, 5% fines, nonplastic 9.0 SN-15 145  $60.\bar{2}$ Bentonite Chips 147.0 No Recovery 147.0'-148.0 Poorly Graded Sand (SP) 148.0-157.0' - wet, dense, 95% fine subrounded sand, 5% 20/40 Sand fines, nonplastic 150



WI-CV-MW08-M

SHEET 6 OF 8

### SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (441676.5 N, 1202808.8 E)

ELEVATION: 205.2 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : RotoSonic 600C Full-sized Track Rig, 8/6", Casing 2/4" Barrel

PROJECT NUMBER:

WATER LEVELS : ---START : 2/8/2017 END : 2/12/17 10:00 LOGGER : E. Bilyeu DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS Log INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 55.2 n n 9.0 SN-16 155 50.2 Schedule 80 - 0.010 Slot Screen 157.0 Grades into Silty Sand (SM) 157.0-160.0' - wet, dense, 95% fine subrounded sand, 5% fines, nonplastic 160 45.2 0.0 Silty Sand (SM) 160.0-162.0' - (GLEY 4/N), wet, stiff, 60% fine subrounded sand, 40% low plasticity fines 11.0 SN-17 Silt (ML) 162.0-167.0' - (GLEY 4/N), wet, very stiff, 100% low to medium plasticity fines with varying low to no dry strength 165 40.2 0.0 167.0 Sandy Silt (ML) 167.0-171.0 - (GLEY 4/N), wet, stiff, 60% low plasticity fines, 25% well graded fine to coarse subrounded sand, 15% fine to coarse subrounded gravel 170 0.0 35.2 Silt (ML) 171.0-181.0' - (GLEY 4/N), wet, stiff, 100% nonplastic to low 10.5 SN-18 plasticity fines 175_ 30.2 0.0 177.0 180



WI-CV-MW08-M SHEET 7 OF 8

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : Coupeville, WA (441676.5 N, 1202808.8 E)

ELEVATION: 205.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotoSonic 600C Full-sized Track Rig, 8/6", Casing 2/4" Barrel

WATE	WATER LEVELS :			START : 2/8/2017	END	: 2/1	2/17	10:00	)	LOGG	ER : E. Bilyeu
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		Ū		PID READIN	GS		
	INTERV/	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT RELATIVE DENSITY OR			ng Zone	bace	lole	COMMENTS	WELL DIAGRAM
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above F		
25.2			#/TITE		_			0.0			
	-	10.5	SN-19	Lean Clay (ML) 181.0-187.0' - (GLEY 4/N), wet, very stiff, medium plasticity, medium dry strength, trace sand							
185_ 20.2	-				-			0.0			
	187.0				-						-
190_ 15.2				Lean Clay (ML) 187.0-191.0' - (GLEY 4/N), wet, very stiff, medium plasticity, medium dry strength, trace sand				0.0			
		10.5	SN-20	Organic Lean Clay (OL/CL) 191.0-196.0' - (GLEY2 5/N), wet, low to medium plasticity, medium dry strength, low to no dilatancy							
195_ 10.2	197.0			Poorly Graded Sand (SP) 196.0-197.0' - (GLEY 4/N), wet, dense, 95% fine subrounde sand, 5% fines				0.0			
200 5.2	-			Lean Clay (CL) 197.0-207.0' - (GLEY 4/N), moist, very stiff, medium plasticit medium dry strength	y,			0.0			
	-	10.0	SN-21		-						
205 0.2	207.0							0.0			- - - -
				Silt (ML) 207.0-217.0' - (GLEY1 4/N), wet, stiff, low to medium plastic low dilatancy, non to low dry strength (varying)	ity,		4			2/10/17 1700 2/12/16 0830	
210							_	+			



### BORING NUMBER: WI-CV-MW08-M

SHEET 8 OF 8

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (441676.5 N, 1202808.8 E)

ELEVATION: 205.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotoSonic 600C Full-sized Track Rig, 8/6", Casing 2/4" Barrel

PROJECT NUMBER:

WATER LEVELS : ---START : 2/8/2017 END : 2/12/17 10:00 LOGGER : E. Bilyeu PID READINGS DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY Breathing 2 Above I SAMPLE #/TYPE -4.8 0.0 10.5 SN-22 215 -9.8 217.0 Silt (ML) 217.0-227.0' - (GLEY1 4/N), wet, stiff, low to medium plasticity, low dilatancy, non to low dry strength (varying) 220 -14.8 0.0 11.0 SN-23 225 -19.8 0.0 227.0 Bottom of Boring at 227.0 ft bgs on 2/12/17 10:00



BORING NUMBER: WI-CV-MW08-S

SHEET 1 OF 5

### SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (441676.8 N, 1202815.4 E)

ELEVATION: 205.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotoSonic 600C Full-sized Track Rig, 6" Casing, 4" Barrel

WAT	ER LEVEL	S :		START : 2/13/17 09:00	END	: 2/1:	3/17	08:30	)	LOGG	ER : E. Bilveu
DEPT	H BELOW	SURFACE	(FT)	SOIL DESCRIPTION		, U	R	PID EADIN	GS		
	INTER'	/AL (FT)	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		OLIC LC	ng Zone	Jace	łole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathir	Headsp	Above F		
205	2_ 0.0 - - - - - -	2.0	SN-1	5' clear with vac truck prior to drilling, no description							
5 200	2 2 - - - 7.0			Well Graded Sand (SW) 5.0-7.0' - dark gray (2.5Y 4/1), dry, loose, 100% subrounded fine to coarse sand, trace fines and gravel							
10 195	2	9.5	SN-2	No Recovery 7.0-7.5' Well Graded Sand (SW) 7.5-9.0' - dark gray (2.5Y 4/1), dry, loose, 100% subrounded fine to coarse sand, trace fines and gravel Well Graded Sand with Gravel (SW) 9.0-17.0' - dark gray (2.5Y 4/1), dry, loose, 85% subrounded fine to coarse sand, 15% fine to coarse subrounded gravel				0.0			
15 190	2_ 2_  							0.0			
20 185 25 180	2	0.0	SN-3	No Recovery 27.0-30.5'	- - - - - - - - - - - - - - - - - - -			0.0		Large gravel obstructing core barrel	



BORING NUMBER: WI-CV-MW08-S

SHEET 2 OF 5

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : Coupeville, WA (441676.8 N, 1202815.4 E)

### ELEVATION: 205.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotoSonic 600C Full-sized Track Rig, 6" Casing, 4" Barrel

WA					START : 2/13/17 09:00 E	ND :	2/13	3/17	08:30	)	LOGG	ER : E. Bilveu
DEF	TH E	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		Ð	R	PID EADIN	GS		
		INTERVA	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		IOLIC LC	ng Zone	pace	lole	COMMENTS	WELL DIAGRAM
				SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above I		
17	5.2_ - - - -		6.5	SN-4	Silty Sand with Gravel (SM) 30.5-33.0' - dark gray (2.5Y 4/1), loose, dry, 55% fine to coarse subrounded sand, predominately fine, 30% nonplastic fines, 15% fine to coarse subrounded gravel Poorly Graded Sand (SP)							
3: 17(	5_ 0.2_ -	37.0			33.0-37.0' - dark gray (2.5Y 4/1), wet from drilling throughout well) 95% fine to medium subrounded sand, 5% fine subrounded gravel				0.0			
4 16	0 5.2				No Recovery 37.0-43.5'				0.0			
4 160	- - - 5 0.2	47.0	4.5	SN-5	<b>Poorly Graded Sand (SP)</b> 43.5-47.0' - dark gray (2.5Y 4/1), dry, loose, 90% fine to coarse subrounded sand, 10% fine subrounded gravel, trace fines, grades coarser down				0.0			
5 15	- - - 5.2_ - - - -		9.5	SN-6	No Recovery 47.0-47.5' Well Graded Sand with Gravel (SW) 47.0-55.0' - dark gray (2.5Y 4/1), dry, loose, 95% fine to medium subrounded sand			-	0.0			
5	5	57.0			Poorly Graded Sand (SP) 55.0-57.0' - dark gray (2.5Y 4/1), dry, loose, 90% fine to coarse predominately fine subrounded sand, 5% fine subrounded gravel, 5% nonplastic fines No Recovery 57.0-58.0'				0.0		1230-1355 2/13/17 - ??	- Bentonite - Grout -
	0						<u></u> .					<u></u>
1								I		1		I



BORING NUMBER: WI-CV-MW08-S

SHEET 3 OF 5

### SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : Coupeville, WA (441676.8 N, 1202815.4 E)

ELEVATION: 205.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotoSonic 600C Full-sized Track Rig, 6" Casing, 4" Barrel

WATE	WATER LEVELS : DEPTH BELOW SURFACE (ET)			START : 2/13/17 09:00	END	2/1	3/17	08:30	)	LOGG	ER : E. Bilyeu
DEPT	HBELOW S	URFACE (	FT)	SOIL DESCRIPTION		Ð	R	PID EADIN	GS		
	INTERV	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT RELATIVE DENSITY OR		OLIC LC	ng Zone	Jace	fole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Headsp	Above F		
145.2	2	9.0	SN-7	Poorly Graded Sand with Gravel (SP) 58.0-65.0' - dark gray (2.5Y 4/1), dry, loose, 80% fine to medium subrounded sand, 15% fine to coarse subrounded gravel, 5% fines nonplastic mostly fine sand grades into coarser				0.0			
65_ 140.2	2 			Well Graded Sand with Gravel (SW) 65.0-67.0' - dark gray (2.5Y 4/1), dry, loose, 85% fine to coars subrounded sand, 15% fine to coarse subrounded gravel	se _			0.0			
	-			Well Graded Sand with Gravel (SW) 67.0-77.0' - dark gray (2.5Y 4/1), dry, loose, 85% fine to coars subrounded sand, 15% fine to coarse subrounded gravel	se _ _						
70_ 135.2	- 2							0.0			
		8.0	SN-8								
75 130.2	2							0.0			
80_ 125.2	    2			No Recovery 77.0-77.5' Well Graded Sand with Gravel (SW) 77.5-80.0' - dark gray (2.5Y 4/1), dry, loose, 85% fine to coars subrounded sand, 15% fine to coarse subrounded gravel Poorly Graded Sand (SP)	 se			0.0			
		9.5	SN-9	80.0-85.0' - dark gray (2.5Y 4/1), moist, loose, 95% fine to medium subrounded sand, 5% fine subrounded gravel							
85_ 120.2	  			Poorly Graded Sand (SP) 85.0-87.0' - dark gray (2.5Y 4/1), moist, medium dense, 95% fine subrounded sand, 5% nonplastic fines				0.0			
90	- - - -			87.0-87.5' Well Graded Sand with Gravel (SW) 87.5-97.0' - moist, loose, 80% fine to coarse subrounded san 20% fine to coarse subrounded gravel	 d,						



BORING NUMBER: WI-CV-MW08-S

SHEET 4 OF 5

### SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (441676.8 N, 1202815.4 E)

ELEVATION: 205.2 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : RotoSonic 600C Full-sized Track Rig, 6" Casing, 4" Barrel

WATER LEVELS : ---START : 2/13/17 09:00 END : 2/13/17 08:30 LOGGER : E. Bilyeu DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 115.2 9.5 SN-10 95 110.2 0.0 97.0 No Recovery 97.0-97.5 Poorly Graded Sand (SP) 97.5-100.5' - (2.5Y 4/2), moist, medium dense, 95% fine subrounded sand, 5% nonplastic fines 100 105.2 0.0 Poorly Graded Sand (SP) 100.5-107.0' - dark gray (2.5Y 4/1), moist, medium dense, 95% fine to medium subrounded sand, 5% nonplastic fines, material SN-11 9.5 grades coarser down well graded gravel , 6" lense at 102.5' 105 100.2 0.0 107.0 No Recovery 107.0-107.5 Poorly Graded Sand with Gravel (SP) 25 SN-12 107.5-110.0' - dark gray (2.5Y 4/1), moist, medium dense, 85% fine to medium subrounded sand, 15% fine to coarse 110.0 subrounded gravel 0.0 Poorly Graded Sand with Gravel (SP) 110.0-111.0' - dark gray (2.5Y 4/1), moist, medium dense, 85% fine to medium subrounded sand, 15% fine to coarse subrounded gravel Poorly Graded Sand (SP) 111.0-113.0' - (2.5Y 4/2), moist, medium dense, 95% fine to medium subrounded sand, 5% nonplastic fines Silty Sand (SM) 113.0-118.0' - (2.5Y 4/2), moist, loose, medium dense, 85% SN-13 fine subrounded sand, 15% nonplastic fines 10.0 0.0 Bentonite Chips Poorly Graded Sand (SP) 118.0-120.0' - (2.5Y 4/2), moist, medium dense, 95% fine to 20/40 Sand medium subrounded sand, 5% nonplastic fines



BORING NUMBER: WI-CV-MW08-S

SHEET 5 OF 5

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : Coupeville, WA (441676.8 N, 1202815.4 E)

### ELEVATION: 205.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : RotoSonic 600C Full-sized Track Rig, 6" Casing, 4" Barrel

WATER	R LEVELS	5 :		START : 2/13/17 09:00	END :	2/1:	3/17	08:30	)	LOGG	ER : E. Bilyeu
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		Ū	R	PID EADIN	GS		
	INTERV/	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		SOLIC LO	iing Zone	space	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above		
	120.0			No Recovery 120.0-120.5' Poorly Graded Sand with Silt (SP-SM) 120.5-127.0' - (2.5Y 4/2), wet, dense, 90% fine subrounded, layered 1-2mm oxidized layering, 10% nonplastic fines				0.0			
		9.5	SN-14	<b>Silt (ML)</b> 127.0-130.0' - (GLEY1 4/N), wet, stiff, fine to medium plastici low dilatancy, no dry strength	  ty,			0.0			2" Schedule – 80 - 0.010 Slot Screen
	130.0			Bottom of Boring at 107.0 ft bgs on 2/13/17 08:30				0.0			
					-						-



WI-CV-MW09-M SHEET 1 OF 8

## SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : SW of Bldg 2807 (436991.0 N, 1200530.7 E)

### ELEVATION: 187.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Tracking 8 Diamater Casing , 7 Core, 6 Casing, 4 Core

WATER	<u>R LEVELS</u>	5:		START : 12/8/16 10:24	END	: 12/	<u>14/16</u>	<u>5 14:2</u>	20	LOGO	ER : R. Clennon
DEPTH	BELOW S	SURFACE (	FT)	SOIL DESCRIPTION			_	PID			
1			,			8	R	EADIN	εS		
1	INTERV	AL (FT)				۲ ۲	e				
1		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		Ĭ	j Zo	8	e	COMMENTS	WELL DIAGRAM
1			、 /	MOISTURE CONTENT, RELATIVE DENSITY OR		ВС	thing	dspa	원		
1			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		Σ	Ireat	Head	bove		
			#/TYPE			s N	-	L -	Ā		
187.2	-			Cleared with air knife and vac truck, no soil description	-	-	1	L			- 18
	-			0.0-5.0	-	-					- 12 12
	-				-	-					K K -
	-				-	-					- 124 12
-	-				-	-					× × × -
	-				-	-					X X -
-	-				-						
· ·	-				-	-					
5	5.0				-	-					
182.2				Poorly Graded Gravel with Sand (GP)	_	•		0			
		27	CNI 1	5.0-7.0 - dark yellowish brown (10YR 3/4), changing to poor	ly -	1. 1					
		2.1	3IN-1	graded sand at ~6.0', moist, medium dense, trace silt			0				
	7.0						1	L			
				Poorly Graded Sand (SP)	-	1	1	0			
I .	4	1		7.0-11.0' - very dark grayish brown (2.5Y 2/2), moist, mediur	n _	-	1	I I			KA KA -
1 .	4			dense, trace gravel	-	1	1	L			- 18
1 .	-				-	-		L			M M -
10	-1	1			-	- E 🗄	1	I I			× × -
177 2	-					1	1	L			$\bowtie$ $\bowtie$ $-$
111.2	-				-	-					
-	-			Woll Graded Gravel with Sand (GW)		••					- 13
	-			11 0-21 0' - very dark gravish brown (2 5Y 2/2) moist	-	•••					- 12 12
	-			medium dense, fine to coarse-grained sand with trace cobble	-	-1::	1				- 🕅 🕅
	-				-	•••					- 🛛 🖓
-	-				-		1				
	-	14.0			-	•••					
		14.0	5N-2		-		0				
15					-	••					
172.2							1				
	_				_		1				
	_				-						N N -
	_				-		1				- 12
	_				-	-					- 12
I •	-	1			-	1::	1	L			- 🕅 🕅
- I	-				-	-[••	ł	L			KA KA -
1 ·	-	1			-	1::	1	I I			N N -
20	-				-	-1	ł	L			- 14 14
167 2	1	1				1::	1	I I			$\bowtie$ $\bowtie$ $-$
1.01.2	21.0				-	1	ł	L			
1	1	1		Poorly Graded Sand with Gravel (SP)		1	1	0			KA KA -
1	1			21.0-23.0' - dark gravish brown (2.5Y 3/2). moist. medium	-	1	1	L			
1	]			dense	-	1	1	L			
1 [·]	]	1						I I			
		1		Poorly Graded Sand (SP)		1.5	j	I I			
1	1	60	SN-3	23.0-25.0' - dark grayish brown (2.5Y 3/2), moist, medium	_	<u> </u>	1	1			K K I
	_	0.0	014-0	dense, trace gravel, predominately fine-grained sand	_	1:1:	1	I I			$\bowtie$
25	4						-	L			
162.2	4	1		Well Graded Sand (GW)	-	- ::	1	I I			- 124
·	-			25.0-27.0' - dark grayish brown (2.5Y 3/2), slightly moist,	-	-	1	L			- 🕅 🕅
·	1 22 0	1		meaium dense	-	- ::	1	I I			KA KA -
- I	21.0	-		Wall Graded Gravel with Sand (CM)		<del> ::</del>	1	0			- 🕅 🕅
·	-	1		vven Graded Graver with Sand (GVV)	- -	-   • •	ł	ľ			KA KA -
	-	1		dense gravel is well rounded		1::	1	I I			- 🕅 🕅
I ·	-	1			-	••	ł	I I			- 12 12
1	1	1			-	1::	1	I I			Ka Ka -
30	1	1			-	••	1	I I			
		1				1	1	1			
1		1				1	1	I I			
							1				1



WI-CV-MW09-M SHEET 2 OF 8

## SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : SW of Bldg 2807 (436991.0 N, 1200530.7 E)

ELEVATION: 187.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Tracking 8 Diamater Casing , 7 Core, 6 Casing, 4 Core

WATER LEVELS :				START : 12/8/16 10:24	END : 12/14/16 14:20			20	LOGGER : R. Clennon			
DEPTH	EPTH BELOW SURFACE (FT)			SOIL DESCRIPTION		PID READINGS		GS				
	INTERV	AL (FT)				CLC	one					
		RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		IBOLI	thing Z	hing Ze space		CONNIVIENTS		
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYM	Breat	Heac	Above			
157.2 - - - - -	-	10.0	SN-4	Poorly Graded Sand (SP) 30.0-37.0' - dark grayish brown (2.5Y 3/2), moist, medium dense, predominately trace fine round gravel			0					
35 152.2_ -	37.0							0		Depth to Water = 34.6' bgs prior to drilling, water may be drilling fluid drilling with		
40 147.2		10.0	SN-5	Poorly Graded Sand (SP) 37.0-47.0' - very dark grayish brown (2.5Y 3/2), very moist, medium dense, predominately fine-grained trace silt, no free standing water				0		water Drilled on 12/8/16, recovered on 12/9/16 after drill rig maintenance on broken part soil length of core screening		
45 142.2	47.0			Dearty Creded Sand (CD)								
50 137.2_ - - - - - - - - - - - - - - - - - - -		10.0	SN-6	47.0-57.0' - very dark grayish brown (2.5Y 3/2), moist, mediu dense, very fine to fine-grained, trace silt, no free standing water	E					Soil screening = 0.0 ppm		
- - - 60	57.0			Poorly Graded Sand (SP) 57.0-67.0' - very dark grayish brown (2.5Y 3/2), moist, mediu dense, predominately fine to very fine, trace silt, no free standing water	m _							



WI-CV-MW09-M SHEET 3 OF 8

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : SW of Bldg 2807 (436991.0 N, 1200530.7 E)

ELEVATION: 187.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Tracking 8 Diamater Casing , 7 Core, 6 Casing, 4 Core

WATER LEVELS :				START : 12/8/16 10:24	END : 12/14/16 14:20			20	LOGGER : R. Clennon		
DEPTH BELOW SURFACE (FT)			FT)	SOIL DESCRIPTION		ġ	R	PID EADING	SS		
	INTERVA	AL (FT)				СГС	one				
		RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR CONSULTENCY SOUL STRUCTURE MINISTURE AND CONTENTS		IBOLI	thing Z	dspace	e Hole	CONNINENTS	
			SAMPLE #/TYPE	CONSISTENCT, SOIL STRUCTURE, MIINERALOGT		SYN	Brea	Hea	Abov		
127.2_					-						- 18
_					_						
-		10.0	SN-7		_					Soil screening =	
-					-					0.0 ppm	- 🕅 🕅
-					_						- 12
$65_{1222}$					_						
					_						
-	67.0				-						
-				Poorly Graded Sand (SP) 67.0-71.5' - very dark gravish brown (2.5Y 3/2), wet (free	-					Some of core recovery fell out	- 🛛 🖓
_				water), (drilling fluid?), medium dense, fine to very fine	_					of core barrel not	× × -
70 -					_					bags Water in soil	
117.2					_					core 67-71.5' -	
-					_					Soil screening =	× × -
_		4.5	SN-8	No Recovery 71 5-77 0'	-					0.0 ppm	- 12
-					_						
-					_						
75_					_						
112.2_					-						- 🛛 🖓
_	77 0				_						
-	11.0			Poorly Graded Sand (SP)	_						
_				medium dense, fine to very fine, silt lense at 82.0' bgs (wet)	_						
-					-						- 🕅 🕅
80_ 107.2											
					_						
-		10.0	SN-9		_						
-		10.0			-					Soil screening = 0.0 ppm	- 🛛 🖓
_					-						
о <u>г</u> –					_						
102.2					_						
-					-						22 -
	87.0			Poorly Graded Sand (SP)							× × ×
				87.0-94.5' - very dark grayish brown (2.5Y 3/2), moist, mediu	um _						
_					_						- Bentonite -
90					-						Grout -



WI-CV-MW09-M SHEET 4 OF 8

## SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : SW of Bldg 2807 (436991.0 N, 1200530.7 E)

### ELEVATION: 187.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Tracking 8 Diamater Casing , 7 Core, 6 Casing, 4 Core

1	NATER	LEVELS	5 :		START : 12/8/16 10:24	END	: 12/	2/14/16 14:20		20	LOGO	ER : R. Clennon	
Г	DEPTH E	EPTH BELOW SURFACE (FT)		FT)	SOIL DESCRIPTION				PID				
	I						8	R	READING		4		
		INTERVA	λ∟ (⊢I)				U U	one					
			RECOVE	RY (FT)	MOISTURE CONTENT RELATIVE DENSITY OR		<u></u>	ng Z	cace	9e	CONNINEIN 13		
				SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		ΥB	eathi	sads	ove			
				#/TYPE			Ś	å	Ŧ	Ab			
Τ	97.2 _					-							
	_					-						- 12	
	-					-						- 12	
	_		7.5	SN-10		-							
						_							
	_					_						- 12 12	
	-					-						- 12	
	95 -				No Recovery								
	92.2				94.5-97.0'	_	1						
						_							
	_	07.0				-						X X -	
	-	97.0			Poorly Graded Sand (SP)							- 18	
	-				97.0-104.5' - very dark gravish brown (2.5Y 3/2), moist.	-							
	_				medium dense, very fine to fine	_							
	_					-						- 12 12	
	100 -					-						- 12	
	87.2												
						_							
	_					_							
	-		10.0	SN-11		-						K K -	
	-					-						- 12 12	
	-					-							
						_							
	405											- 12	
	105				Clay (CL) 104 5 105 8' dark gravish brown (2 5X 4/2) very moist ver	~ <u> </u>	V//						
	02.2				$\sim$ stiff. low plasticity. no free water	у _							
	_				Clayey Sand (SC)		V//						
	_	107.0			105.8-114.0' - dark grayish brown (2.5Y 4/2), very moist, ver	у	V//						
	-				stiff, very fine	-	///				PID battery died	- 🕅 🕅	
	-					-							
	_					-	V//						
						_	V//						
	110						V//	1					
	//.Z _					-						- 🕅 🕅	
	_					-	V//						
						_	V//	1					
	_					_	V///	1				K K -	
	_					-	///					- 12	
	-					-	V//						
			16.0	SNI 12	Clayey Silt (ML)	_		1					
	115		10.0	011-12	114.0-122.0' - very dark gray (N 3/0), wet/very moist, very st	iff,							
	12.2				trace tine to coarse subangular gravel, low plasticity	-						N N -	
	-					-							
	-					-	1						
						_							
	_					-						K K -	
	_					-						$\bowtie$	
	-					-							
	120					_							



WI-CV-MW09-M SHEET 5 OF 8

## SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : SW of Bldg 2807 (436991.0 N, 1200530.7 E)

### ELEVATION: 187.2 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Tracking 8 Diamater Casing , 7 Core, 6 Casing, 4 Core

WATE	R LEVELS	S :		START : 12/8/16 10:24	END : 12/14/16 14:20			20	LOGGER : R. Clennon		
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		U	PID READINGS		GS		
1	INTERV	ERVAL (FT)				IC LO	one.			COMMENTS	WELL DIAGRAM
		RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		<b>ABOL</b>	thing Z	dspace	e Hole		
			SAMPLE #/TYPE	CONSISTENCT, SOIL STRUCTURE, MINERALUGT		SYN	Brea	Неа	Abov		
67.2	- - - 122 0				-					Set 8 casing at 120' bgs, telescope in with 6 casing and 4	
125 62.2 130 57.2		15.0	SN-13	Extra Recovery = Clayey Sand with Gravel (SC) 122.0-123.0' - very dark gray N 3/0), very moist, medium dense, fine to coarse subangular Clayey Sand with Gravel (SC) 123.0-137.0' - fine to coarse well rounded to subrounded gravel, trace cobbles, gravel decreases at 124.0' to mostly clayey sand with trace coarse to fine gravel, 129.5' to 130.5' = fine to coarse sand lense, some silt, silt coated increases with depth, less plastic, dark gray (2.5Y 4/1), moist to dry at 133.0 to 137.0', medium dense to dense						core barrel Drilled with 4 core barrel 122.0-127.0': VOC = 0.4 ppm, CO = 27 ppm 127.0-132.0': VOC = 0.0 ppm, CO = 10 ppm	
135_ 52.2	- - - - - - - - - - - - - - - - - - -									CO = 12 ppm Soil screening : VOC = 0.0 ppm, CO max ~40 ppm at ~134.0'	
140 47.2 145 42.2		8.5	SN-14	Silty Sand with Gravel (SM) 137.0-139.5' - dark gray (2.5Y 4/1), very moist, dense, fine to coarse gravel, rounded, mostly fine sand Poorly Graded Sand with Silt (SP-SM) 139.5-146.5' - dark gray (2.5Y 4/1), very moist, dense, decreasing silt with depth No Recovery 146.5-152.0'						Bottom of sample, fell out of core barrel 137.0-142.0': VOC = 0.0 ppm, CO = 19 ppm fell out of core barrel 142.0-145.0': VOC = 0.0 ppm, CO = 27 ppm Soil screening = 0.0 ppm	
1											


WI-CV-MW09-M SHEET 6 OF 8

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SW of Bldg 2807 (436991.0 N, 1200530.7 E)

ELEVATION: 187.2 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Tracking 8 Diamater Casing , 7 Core, 6 Casing, 4 Core

WATEF	R LEVELS	5 :		START : 12/8/16 10:24	END	: 12/	14/16	14:2	20	LOGO	ER : R. Clennon
DEPTH	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		, U	R	PID EADIN	GS		
	INTERV	AL (FT)		SOIL NAME LISSS STOLLS STATEST SST		СГС	one				
		RECOVI	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		BOLI	ning Z	space	Hole	COMMENTS	
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYM	Breat	Head	Above		
37.2					_						
-					-						- 🛛 🖓
-	152.0			Poorly Graded Sand with Silt (SP-SM)		er tar				152.0.156.01	
				152.0-155.5' - dark gray (5Y 4/1), very moist/wet, medium	_	臣臣				VOC = 0.2  ppm,	
-	-			dense, very fine sand, trace fine gravel	-					CO = 36 ppm	- 🕅 🕅
155					_	다					
32.2											
-	-	8.0	SN-15	Poorly Graded Sand (SP) 155.5-162.5' - dark grav (5Y 4/1), very moist/wet, medium	-					156.0-160.0':	- 🕅 🕅
-				dense, very fine to fine	_					VOC = 0.1  ppm,	
-					_					Soil screening:	
-	-				-					VOC = 0.0  ppm, CO = 0.0  ppm	- X
100	160.0				_						
27.2	100.0				_					No water level	
-	-				-					measured at day	- 🕅 🕅
-					_					core barrel is in	
-				Silty Sand (SM)		Ш				drilled on	
-	-	9.0	SN-16	162.5-164.0' - dark gray (5Y 4/1), very moist/wet, dense, fine sand	· –					12/13/16 160- 167' bas	- 🛛 🖓
405				Poorly Graded Sand (SP)	_					160.0-164.0':	
165 22.2	1			164.0-167.0' - dark gray (5Y 4/1), very moist/wet, medium dense. very fine to fine						= 22	
-				·····	_					164.0-167.0': VOC = 0.1 . CO	X X -
-	167.0									= 10	
-	-			Poorly Graded Sand (SP) 167.0-175.9' - dark gray (5Y 4/1), very moist/wet, medium	-					VOC = 0.0, CO =	- 🕅 🕅
-				dense, very fine to fine-grained	_					0.0 BZ: VOC = 0.0.	
-					_					CO = 0.0	
170 17.2	-									167.0-172.0':	X X -
-					_					VOC = 0.1 , CO = 10	
-					_						
-	-				-					172.0-176.0': VOC = 0.1. CO =	- 🛛 🖓
-	-				_					12 Soil coreening:	
-					_					VOC = 0.0, CO =	
175 12.2	-	8.9	SN-17							0.0 BZ: VOC = 0.0	X X -
-	1			No Recovery						CO = 0.0	
				175.9-183.0' - sample fell out of core barrel	_						
-	-				_						22
	1				_						
					-						-Bentonite - Chins -
180									-		



WI-CV-MW09-M SHEET 7 OF 8

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SW of Bldg 2807 (436991.0 N, 1200530.7 E)

ELEVATION: 187.2 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Tracking 8 Diamater Casing , 7 Core, 6 Casing, 4 Core

WATE				START : 12/8/16 10:24	END : 12/14/16 14:20 LOGO			OGGER : R. Clennon			
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		U	R	PID EADIN	GS		
	INTERV	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT. RELATIVE DENSITY OR		SOLIC LO	ing Zone	pace	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above I		
7.2	_		#/TIFE		_						91 (S) -
	-				-						← 20/40 Sand
185_ 2.2	183.0	40.0	SN-18	Silty Sand (SM) 183.0-183.6' - dark gray (5Y 4/1), moist, medium dense, fine-grained Pulverized Rock) 183.6-185.5' - dry, gray, possible boulder (sonic bit crushed Poorly Graded Sand (SP) 185.5-187.0' - dark gray (5Y 4/1), wet, medium dense, fine to			- - - -			Headslpace: 183.0-187.0': VOC = 0.1 , CO = 0 Soil screening: VOC = 0.0, CO = 0.0	
190 <u>-</u> -2.8	187.0  			very fine-grained <b>Poorly Graded Sand (SP)</b> 187.0-191.0' - dark gray (5Y 4/1), wet, medium dense, very to to fine-grained, trace silt form 190.0-191.0'	fine		· - - - -			B2: VOC = 0.0, CO = 0.0 Headslpace: 187.0-192.0': VOC = 0.1 , CO = 10	2" Schedule - 80 - 0.010 Slot Screen
		10.5	SN-19	Pulverized Rock 191.0-192.8' - dry, gray, possible boulder Silt (ML) 192.8-194.5 - dark gray (5Y 4/1), moist, medium dense, low plasticity						192.0-197.0': VOC = 0.1, CO = 4 Soil screening: VOC = 0.0, CO =	
195_ -7.8	197.0			Poorly Graded Sand (SP) 194.5-197.0' - dark gray (5Y 4/1), very moist, medium dense fine to very fine, trace silt Silt (MI)	2, 		• • •			0 BZ: VOC = 0.0, CO = 0.0	
200_ -12.8				197.0-217.0 - dark gray (5Y 4/1), moist, medium dense/stiff, fine sand lense at 215.0' to 215.5', color change to black (5Y 2.5/1) at 213.0' bgs, low plasticity, trace fine sand throughou trace wood and grass fibers throughout	, – it, _ –					197.0-202.0': VOC = 0.1 , CO = 0	
205					-					202.0-207.0': VOC = 0.1, CO = 10	
-17.8		20.0	SN-20		-					207.0-212.0': VOC = 0.1, CO = 0	



WI-CV-MW09-M SHEET 8 OF 8

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : SW of Bldg 2807 (436991.0 N, 1200530.7 E)

ELEVATION: 187.2 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Tracking 8 Diamater Casing , 7 Core, 6 Casing, 4 Core

WATER	WATER LEVELS :			START : 12/8/16 10:24	END : 12/14/16 14:20 LOGGER : R. C		ER : R. Clennon				
DEPTH	DEPTH BELOW SURFACE (FT)		FT)	SOIL DESCRIPTION		(1)	D		29		
	INTERV	AL (FT)		SOIL NAME, USCS GROUP SYMBOL, COLOR,		LIC LOG	Zone	N		COMMENTS	WELL DIAGRAM
		RECOVE	SAMPLE	MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMBO	Breathing	Headspac	Above Hol		
-22.8			#/11FE		_				_		
-22.8 215 -27.8	217.0		SAMPLE #/TYPE	Bottom of Boring at 217.0 ft bgs on 12/14/16 14:20			Breathing	Headspa	Above Ho	212.0-217.0': VOC = 0.1, CO = 0 Soil screening: VOC = 0.0, CO 0 BZ: VOC = 0.0, CO = 0 Bottom of hole at 217' bgs	
					_						-
							1				



BORING NUMBER: WI-CV-MW09-S

SHEET 1 OF 5

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SW of Bldg 2807 (436988.9 N, 1200524.7 E)

ELEVATION: 187.2 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Track Rig, 6" Casing, 4" Core Barrel

WAT	ATER LEVELS :				START : 12/16/16 13:45	END	: 12/	20/1	3 13:	25	LOGO	ER : R. Clennon
DEP	TH B	ELOW SI	URFACE (	FT)	SOIL DESCRIPTION		ŋ	F	PID EADIN	IGS		
		INTERVA	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		SOLIC LO	ng Zone	pace	fole	COMMENTS	WELL DIAGRAM
				SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above I		
187	'.2_ _ _ _ _	0.0	6.2	SN-1	Silt (ML) 0.0-3.4' - very dark brown to yellowish brown (10YR 2/2 to 10YR 5/4), moist, medium dense, trace organics/grass, low plasticity	-					Headspace: 0-7: VOC = 0.1, CO = 0 Soil screening: VOC = 0.0, CO = 0 BZ: VOC = 0.0,	
5 182	2.2	7.0			3.4-7.0' - yellowish brown (10YR 5/4), moist, medium dense, fine to coarse sand and fine to coarse subrounded gravel			• • •			0	
1( 177	) 7.2 - - - - - -		5.0	SN-2	Silty Sand with Gravel (SM) 7.0-7.6' - yellowish brown (10YR 5/4), moist, medium dense, ine to coarse sand and fine to coarse subrounded gravel Poorly Graded Sand (SP) 7.6-15.0' - very dark grayish brown (2.5Y 3/2), wet (leaves moisture on glove), medium dense, predominately fine-graine trace coarse subrounded gravel	ed,					Headspace: 7-15: VOC = 0.5, CO = 24 Soil screening: VOC = 0.2 (max), CO = 0 BZ: VOC = 0.0, CO = 0	
1! 172	5 2.2_ 	15.0	2.0	SN-3	Well Graded Sand with Gravel (SW) 15.0-17.0' - very dark grayish brown (2.5Y 3/2), moist, mediu dense, gravel is well rounded to subrounded	- m					Headspace: 15-17: VOC = 0.3, CO = 14 Soil screening:	
21 167 29 162		17.0	11.5	SN-4	<ul> <li>Well Graded Sand (SW)         <ol> <li>Yery dark grayish brown (2.5Y 3/2), very moist, medium dense, predominately fine, trace gravel</li> </ol> </li> <li>Silty Sand (SM)         <ol> <li>Yery dark grayish brown (2.5Y 3/2), wet, medium dense, trace fine gravel, cobble at 21.0' bgs</li> <li>Silty Gravel with Sand (GM)             <ol> <li>Yery dark grayish brown (2.5Y 3/2), moist to dry, medium dense, fine to coarse well rounded to subrounded gravel and fine to coarse sand</li> </ol> </li> <li>Poorly Graded Sand (SP)         <ol> <li>Yery Jark grayish brown (2.5Y 3/2), very moist/w mostly fine, trace fine gravel</li> </ol> </li> </ol></li></ul>						VOC = 0.0, CO = 0 BZ: VOC = 0.0, CO = 0 Stop 12/16/16 Start 12/19/16 Driller believes he hit a rock during drilling and pushed it down, resulting in poor recovery Headspace: 17-22: VOC = 0.3 22-27: VOC = 0.2 Soil screening: VOC = 0.0 BZ: VOC = 0.0 Driller believes he hit a rock during drilling and pushed it down, resulting in poor recovery	
30	J				28.5-37.0'							



BORING NUMBER: WI-CV-MW09-S

SHEET 2 OF 5

## SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : SW of Bldg 2807 (436988.9 N, 1200524.7 E)

ELEVATION: 187.2 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Prosonic 600C Full-size Track Rig, 6" Casing, 4" Core Barrel

WATER LEVELS : ---START : 12/16/16 13:45 END : 12/20/16 13:25 LOGGER : R. Clennon DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 157.2 35 152.2 37.0 Poorly Graded Sand (SP) Headspace: 37.0-43.1' - very dark grayish brown (2.5Y 3/2), very moist, 37-43: VOC = medium dense, mostly fine, <10% fines (silt) 0.3 Soil screening: VOC = 0.0 BZ: VOC = 0.0 40 147.2 6.1 SN-5 No Recovery 43.1-47.0' 45 Bentonite 142.2 Þ Grout 47.0 Silty Sand (SM) Headspace: 47.0-53.0' - dark gravish brown (2.5Y 4/2), moist, medium 47-52: VOC = dense, very fine-grained 0.2 52-56: VOC = 0.2 Soil screening: 50 137.2 VOC = 0.0 BZ: VOC = 0.0 9.0 SN-6 Poorly Graded Sand (SP) 53.0-56.0' - dark gravish brown (2.5Y 4/2), moist, medium dense, fine to very fine-grained 55 132.2 No Recovery 56.0-59.0' 59.0 60



BORING NUMBER: WI-CV-MW09-S

SHEET 3 OF 5

## SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : SW of Bldg 2807 (436988.9 N, 1200524.7 E)

ELEVATION: 187.2 ft

DRILLING CONTRACTOR : Cascade Drilling

WAT	ER LEVEL	S :		START : 12/16/16 13:45	END	: 12/2	20/16	13:2	25	LOGG	ER : R. Clennon
DEPT	H BELOW	SURFACE	(FT)	SOIL DESCRIPTION		U	R	PID EADIN	GS		
	INTER	/AL (FT)				LO LO	e				
		RECOV	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		OLIC	ng Zo	oace	lole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above H		
65	2_ - - - - - - - - - - - - - - - - - - -	6.8	SN-7	Poorly Graded Sand (SP) 59.0-65.8' - dark grayish brown (2.5Y 4/2), moist, medium dense, mostly very fine sand, little silt						Headspace: 59-66: VOC = 0.2 Soil screening: VOC = 0.0 BZ: VOC = 0.0	
122	2_ 			No Recovery 65.8-67.0'	-						
70 117	- - - 2 - - - - - - - - - - - -	6.3	SN-8	Poorly Graded Sand with Silt (SP-SM) 67.0-73.3' - dark grayish brown (2.5Y 4/2), moist, medium dense, very fine sand, silt is throughout and in lenses						Headspace: 67-73: VOC = 0.1 Soil screening: VOC = 0.0 BZ: VOC = 0.0	
75 112	- - 2 - - - - 77.0			No Recovery 73.3-77.0'		*					
80 107				<ul> <li>Poorly Graded Sand with Silt (SP-SM)</li> <li>77.0-80.5' - dark grayish brown (2.5Y 4/2), very moist, no fre water, medium dense, fine-grained sand</li> <li>Silty Sand (SM)</li> <li>80.5-90.5' - dark grayish brown (2.5Y 4/2), very moist, no fre water, medium dense to dense at 86.0-89.7' bgs, very fine sand and silt</li> </ul>	e _ _ _ _ _ e _ _ _ _ _ _ _ _ _ _ _					Headspace: 77-82: VOC = 0.3 82-87: VOC = 0.4, $H_2S = 0.7$ , LEL = 4% 87-92: VOC = 0.3 92-94: VOC = 0.3 Soil screening: VOC = 0.0, CO = 14 (max) BZ: VOC = 0.0	
85 102 90	2_ - - - - - - - - - - - - - - - - - - -	17.1	SN-9								



BORING NUMBER: WI-CV-MW09-S

SHEET 4 OF 5

## SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : SW of Bldg 2807 (436988.9 N, 1200524.7 E)

ELEVATION: 187.2 ft

DRILLING CONTRACTOR : Cascade Drilling

WAT	ER LEVEI	_S :		START : 12/16/16 13:45	END	: 12/2	20/16	13:2	25	LOGG	ER : R. Clennon
DEPT	H BELOW	SURFACE	(FT)	SOIL DESCRIPTION		. ഗ	R	PID EADIN	GS		
	INTER	VAL (FT) RECOV	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		SOLIC LC	ing Zone	space	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above		
97.:	2			Poorly Graded Sand with Silt (SP-SM) 90.5-94.1' - dark grayish brown (2.5Y 4/2), moist, medium dense, very fine to fine-grained, some thin silt lenses 93.0-94 bgs	0'						<ul> <li>Bentonite –</li> <li>Chips –</li> <li>–</li> /ul>
95 92.:	- - 2 - -			<b>No Recovery</b> 94.1-97.0'	-		-				
10( 87.	97.0 - - - - - - - - - - - - - - - - - - -	10.8	SN-10	Poorly Graded Sand (SP) 97.0-104.2' - dark grayish brown (2.5Y 4/2), very moist, medium dense, trace silt <10%, very fine to fine-grained, clay in lenses at 103.0-104.2' bgs						Stop 12/19/16 Start 12/20/16 Headspace: 97-102: VOC = 0.3 102-107: VOC = 0.3 Soil screening: VOC = 0.0 BZ: VOC = 0.0	2" Schedule - 80 - 0.010 Slot Screen
105 82.1	- 2 - - - - - - - - - - - - - - - - - -	)		Clayey Silt (ML) 104.2-107.0' - dark grayish brown (2.5Y 4/2), very moist, stiff little very fine sand throughout	 , 						
11( 77. 11! 72.	- - - - - - - - - - - - - - - - - - -	14.0	SN-11	Silty/Clayey Fine Sand (SM-SC) 107.0-117.8' - dark grayish brown (2.5Y 4/2), wet, stiff, color change at 117.5' to very dark gray (N 3/0), very fine to fine sand						Headspace: 107-112: VOC = 0.1 112-117: VOC = 0.2 Soil screening: VOC = 0.0 BZ: VOC = 0.0	
				Clayey Silt (ML) (Stretch Recovery) 117.8-120.0' - very dark gray (N 3/0), very moist, stiff, low plasticity	-					Bottom of hole = 117' bgs 12/20/16	



BORING NUMBER: WI-CV-MW09-S

SHEET 5 OF 5

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SW of Bldg 2807 (436988.9 N, 1200524.7 E)

ELEVATION: 187.2 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER LEVELS :	START : 12/16/16 13:45	END	: 12/2	20/16	13:2	25	LOGG	ER : R. Clennon
DEPTH BELOW SURFACE (FT)	SOIL DESCRIPTION		U	R	PID EADING	GS		
INTERVAL (FT) RECOVERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		OLIC LO	ano Zone	ace	lole	COMMENTS	WELL DIAGRAM
SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathir	Headsp	Above F		
SAMPLE #/TYPE	Clayey Sand (SC) (extra recovery) 120.0-121.0' - very dark gray (N 3/0), wet, stiff/stiff, dense, we fine Bottom of Boring at 117.0 ft bgs on 12/20/16 13:25	ery			He	Abo		



BORING NUMBER: WI-CV-MW10-D

SHEET 1 OF 7

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SE of runway (436180.8 N, 1203179.8 E)

ELEVATION: 188.3 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER	LEVELS	:		START : 1/10/17 14:15	END	: 1/1	<u>6/17</u>	17:00	)	LOGG	ER : N. Badon
DEPTH E	BELOW S	URFACE (	FT)	SOIL DESCRIPTION				PID	20		
		, ,	,			8	R		38		
	INTERVA	AL (FI)				5	ane				
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		5	ig Zo	ace	ole	COMMENTS	WELL DIAGRAM
				CONSISTENCY SOIL STRUCTURE MINERALOGY		βğ	athin	dsp	θĤ		
			SAMPLE #/TYDE			λ	Brea	Hea	Abov		
188 3			#/ITFE	Cleared with vac truck for utilities, po soil description					`		
100.0_					-	·					
-				0.0 0.0	-						
-					-						
_					_						
_					_						
_					_						
					_						
_					_					Drilling with	
5	5.0									water/mud	
183.3				Well Graded Sand (SW)	_					Headspace: 0 ₂	
-		4.0	SN-1	5.0-7.0' - Very dark grayish brown (10YR 3/2), wet, loose, fine						= 20.9	- 124
-	70			to coarse, little to line coarse rounded gravel, trace sit	-	·				$LEL = 0, \Pi_2 S = 0$	
-	7.0			Poorly Graded Sand (SP)						$v_{00} = 0$ $c_{0} = 0$	- 19
-				7 0-9 5' - very dark grav (10YR 3/1) moist loose	-					Headspace $0_{\circ}$	- 12
_				predominately fine. trace fine rounded gravel, trace silt	_					= 20.9	
-				p	_					$LEL = 0, H_2S =$	
_					_					0	
10				Well Graded Gravel with Sand (GW)		•••				VOC = 0, CO = 0	
178.3				9.5-17.0' - very dark gray (10YR 3/1), slightly moist, loose, fin	e _	<b>]</b> :::	1				
_				to coarse with some cobbles rounded to well rounded, fine to	_	<b>!::</b>					$\bigotimes$ $\bigotimes$ _
_				coarse sand	_		1				
_		10.5	SN-2		_		1				
-					_						N N -
_					-	1::	1				- 24
-					-						- 🕅 🖓
-					-	1::	1				- 🕅 🕅
15					-	•••					- 14
173.3						1::	1			Headspace: 0	$\otimes$ $\otimes$ $-$
110.0_					-	••				= 20.9	- 24
-					-	1::	1			LEL = 0. H ₂ S =	
-	17.0				_	••				0	
				Well-Graded Gravel with Sand (GW)						VOC = 0, CO = 0	
_				17.0-26.5' - ~10% silt, fine to coarse rounded and well-rounded	ed _		1			Headspace: 02	
_				gravel, fine to coarse sand, trace well-rounded cobbles, 2.5Y	_	<b>!::</b>	1			= 20.9	
_				3/1 very dark gray, slightly moist to dry 26-26.2', loose	_		ł			LEL = 0, $H_2S =$	- 18
					-	<b>!::</b>	1				- 12
20						••				12	$\bigotimes \boxtimes -$
100.5					-	1::	1			12	- 12
-					-	••					
-					-		1				
-		10.0	SN-3		-	••					
-					_		1				
_					_					Headspace: 0,	
							1			= 20.9	
_					_	<b>!::</b>	1			$LEL = 0, H_2S =$	
25							ł			0	
163.3_					_	l::	1			VOC = 0.0, CO =	
-					_	••				9	
_	07.0			De auto Que de d. Osu d. (OD)		••	-				
-	27.0			Poorly Graded Sand (SP)	_						- 121
-				20.5-27.0 - Vely ualk gray (2.51 5/1), molst, loose,	/-	나나					X X -
-				De ante Ora de el Derra desitte Oite (OD ON)		Цi				-20.9 IEI - 0 H S -	- 12
-				27 0 36 0' yeny dark gravish brown (2 5V 3/2) slightly mois	+ -					$10^{-10}$	
_				to dry 31 5-34 5' loose predominately fine-grained	ι _					VOC = 0.1. CO =	
30				to any office office, house, predominatory integrained	_	十日				46	
						L				1	
				a							



BORING NUMBER: WI-CV-MW10-D SHEET 2 OF 7

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SE of runway (436180.8 N, 1203179.8 E)

ELEVATION: 188.3 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER LEVELS : DEPTH BELOW SURFACE (FT)				START : 1/10/17 14:15	END	: 1/10	<u>6/17</u>	17:00	)	LOGG	ER : N. Badon
DEPTH E	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		(J)	R	PID EADING	GS		
	INTERVA	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,			ig Zone	ace	ole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathir	Headsp	Above H		
158.3_ - - - - - -		9.0	SN-4							Headspace: $0_2$ = 20.9 LEL = 0, H ₂ S = 0 VOC = 0, CO = 0	
35_ 153.3_ 	27.0			No Recovery							
-	37.0			Poorly Graded Sand (SP) 37.0-47.0' - dark gray (2.5Y 4/1), slightly moist 36.0-37.0', dr above, loose, trace silt and silt lenses, predominately fine and very fine sand	y					Drilled to 47' on 1/10/17, retrieve sample on 1/11/17	
40 148.3_ - - - -		10.0	SN-5							Headspace: $0_2$ = 10.3 LEL = 5, H ₂ S = 2.2 VOC = 0.1, CO = 0 Headspace: $0_2$	
45 143.3_ 	47 0									= 20.9 LEL = 0, H ₂ S = 0 VOC = 0.1, CO = 0	
- - - 50_ 138.3_	51.0	2.0	SN-6	Poorly Graded Sand with Silt (SP-SM) 47.0-49.0' - dark gray (2.5Y 4/1), slightly moist, loose, predominately very fine to fine, trace fine well rounded gravel and trace well rounded cobbles <b>No Recovery</b> 49.0-51.0'	-					Start 1/11/17 Headspace: $0_2$ = 20.1 LEL = 5, H ₂ S = 1.3 VOC = 0.5, CO = 65 Breathing zone	
55 133.3_		7.0	SN-7	<b>Poorly Graded Sand wit Silt (SP-SM)</b> 51.0-57.0' - dark gray (2.SY 4/1), slightly moist, loose, predominately fine and very fine						Headspace: $0_2$ = 20.5 LEL = 0, H ₂ S = 0 VOC = 0, CO = 0	
	57.0			<b>Poorly Graded Sand (SP)</b> 57.0-58.7' - dark grayish brown (2.5Y 4/2), slightly moist, loo very fine and fine sand	 se,						
60					_						



BORING NUMBER: WI-CV-MW10-D

SHEET 3 OF 7

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SE of runway (436180.8 N, 1203179.8 E)

ELEVATION: 188.3 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER	LEVELS	:		START : 1/10/17 14:15	END	: 1/1	<u>5/17</u>	17:00	)	LOGG	ER : N. Badon
DEPTH E	BELOW SU	JRFACE (	FT)	SOIL DESCRIPTION		(1)	R		35		
	INTERVA	(FT)				ğ				-	
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		30LIC I	ing Zone	space	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		λMI	Breath	Heads	Above		
128.3			#/TYPE	Gravelly Silt with Sand (ML)			-		4	Headspace: 0	
120.0				58.7-63.3' - dark brown (2.5Y 4/3). slightly moist, very stiff, fir	ne –					= 20.1	X X -
				to coarse well rounded gravel and well rounded cobbles, fine	to _					$LEL = 3, H_2S =$	
_		10.0	SN-8	coarse sand	_					5	× × -
-					-					VOC = 0.3, CO =	-
-					-					40	- 🕅 🕅
_				Clay (CL)	_	V//				Headspace: 02	
a= -				63.3-65.8 - Olive brown (2.54 4/3), slightly moist, very sun	_	V//				= 20.1	- 18
65 123 3						///				LEL = 0, $H_2S = 0.7$	
125.5					_		1			VOC = 0.1, CO =	- 🕅 🕅
_				Sandy Lean Clay with Gravel (CL)		V//	1			27	
_	67.0			$\sim$ to coarse sand and fine to coarse subrounded gravel	ne _	///				Headspace: 0 ₂	
-				Clavey Sand (SC)		///				= 20.1	- 🕅 🕅
-				67.0-73.0' - olive brown (2.5Y 4/3), moist, medium dense,	-					0.6	- 🛛 🕅
-				some well rounded gravel, sand is predominately fine, few cla	ay –					VOC = 0, CO =	
				lenses throughout, cohesive	_					30 Hoodenooo: 0	
70						///	1			= 20.3	$\otimes \otimes -$
110.5					-					LEL = 0, $H_2S =$	- 12
_					_					0	
_		10.7	SN-9		_					VOC = 0, CO = 0 Headspace: 0	
_			0.10		-					= 19.7	N N -
-				Silty Sand (SM)						$LEL = 4, H_2S =$	X X -
_				73.0-77.0' - olive brown (2.5Y 4/3), dry to slightly moist, loose	э, _					1.3	
				now cohesive, with silt lenses, sand is fine grained, trace fine	-					57	
/5				rounded gravel						Headspace: 0 ₂	
110.0				Note: silt lenses are cohesive/cemented	-					= 19.7	
_					_					LEL = 0, $H_2S =$	
-	77.0			De ante Ore de la Demidenciale Oila (OD ONI)						VOC = 0.0. CO =	
-				77 0-84 5-' - olive brown (2 5Y 4/3) moist medium dense	-	情				0	- 🕅 🕅
-				predominately fine sand, some medium to coarse grains, trac	e –	Цŀ				re celibrated	- 12
_				fine rounded gravel, silt also occurs in lenses with sand and i	s _					fresh air	
oo -				cohesive, slightly clayey	_	ЦÌ				$0_2 = 20.9\%$	
108.3						臣				Headspace: 02	
					-	i li				= 21.4	
_					_	님님				0.7	
-		7.5	SN-10		-	計				VOC = 0.3, CO =	- 🕅 🕅
-					-	민신				34	- 🛛 🖓
_					_	Ηł					
_					_	민물					K K -
85 -				No Bosovoru		1.1					- 🕅 🕅
103.3				84.5-87.0'						Headspace: 0,	
					_					= 21.4	
	07.0				_					LEL = 0, $H_2S =$	K K -
-	87.0			Clay (CL)		///				$V_{OC} = 0$ $C_{O} = 0$	99 -
-				87.0-92.6' - olive brown (2.5Y 4/3), moist, stiff, cohesive. som	ne –	V//	1				K K -
				mottling, fine sand, trace fine rounded gravel	_	V///	1				
					-	V//	1				K K -
90					-	V//	1				- 🕅 🕅
							1				ул LУЛ
							-		-		



BORING NUMBER: WI-CV-MW10-D

SHEET 4 OF 7

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SE of runway (436180.8 N, 1203179.8 E)

ELEVATION: 188.3 ft

DRILLING CONTRACTOR : Cascade Drilling

WA	ATER	LEVELS	S :		START : 1/10/17 14:15	END	: 1/1	6/17 1	17:00	)	LOGG	ER : N. Badon
DE	EPTH E	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		(1)	D		29		
							ğ				4	
			RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		BOLIC L	hing Zone	space	Hole	COMMENTS	WELL DIAGRAM
				SAMPLE #/TYPF	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYM	Breath	Head	Above		
9	8.3						////				Headspace: 0,	
			9.3	SN-11	Poorly Graded Sand (SP) 92.6-96.3' - olive brown (2.5Y 4/3), slightly moist to dry, loose	- - - -					= 21.8 LEL = 4, $H_2S$ = 1.3 VOC = 0.2, CO = 57 Headspace: $0_2$	
g	95 )3.3 _ 				very fine, little silt	-					= 21.9 LEL = 0, H ₂ S = 0 VOC = 0, CO = 0	Grout -
	_	97.0			No Recovery	-						
1 8	- - - 100 88.3 _ -				96.3-97.0' <b>Clay (CL)</b> changing to Sandy Clay (SC) at 103' bgs 97.0-107.0' - brown (10YR 4/3), some mottling, moist, very st sand is fine-grained and in lenses below 103' and combined with clay, some claystone fragments	 iff,  					Headspace: $0_2$ = 21.3 LEL = 2, H ₂ S = 0.6 VOC = 0.1, CO = 36	
1 8	- - - 105_ 33.3 _ - -	107.0	12.3	SN-12	Poorly Graded Sand (SP)	- - - - - - - - - - - - - -					Stop 1/11/17	
1 7	- - - 110 '8.3 _ -				<ul> <li>107.0-110.0' - dark yellowish brown (10YR 4/4), slightly mois loose, very fine and fine-grained, trace silt in lenses with sand (cohesive lenses)</li> <li>Poorly Graded Sand with Silt Lenses (SP) and (ML) 110.0-117.0' - olive brown (2.5Y 4/3), slightly moist, loose sa and stiff silt lense, sand is fine to fine grained, silt occurs in lenses. consolidated with some iron staining, silt lenses are ~</li> </ul>	t, I 					Start 1/12/17 Headspace: $0_2$ = 20.6 LEL = 0.0, H ₂ S = 0.6 VOC = 0.1, CO = 25	
1 7	- - - 3.3 _ - - -	117.0	11.0	SN-13	0.4 ft thick Poorly Graded Sand (SP) 117.0-119.0' - dark grayish brown (2.5Y 4/2), moist, loose,	- - - - - - - - - - - - - - - - - -					Headspace: $0_2$ = 20.6% LEL = 0.0, H ₂ S = 0 VOC = 0, CO = 0 Headspace: $0_2$ = 20.9	
1	- - 120				trace coarse sand, predominately fine grained						LEL = 4, H ₂ S = 2.3 VOC = 0.3, CO = 94	



BORING NUMBER: WI-CV-MW10-D

SHEET 5 OF 7

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SE of runway (436180.8 N, 1203179.8 E)

ELEVATION: 188.3 ft

DRILLING CONTRACTOR : Cascade Drilling

WATE				START : 1/10/17 14:15	END	: 1/16	6/17	17:00	)	LOGG	ER : N. Badon
DEPTH	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		(ľ)	R	PID EADIN	GS		
1	INTERV	AL (FT)				Ď	ø		1	1	
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		DLIC	do Zon	e	<u>e</u>	COMMENTS	WELL DIAGRAM
				MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY SOIL STRUCTURE MINERALOGY		ИВС	athing	edspe	ve Ho		
			SAMPLE #/TYPE			S۲I	Brei	Hea	Abo		
68.3	_			Silty Sand (SM)	_						
	-			119.0-120.7' - dark grayish brown (2.5Y 42/), moist, dense,	/-						- 🕅 🕅
	-		0144	Well Graded Sand (SW)/Sandstone with Cobbles (pulveri	/ _ zed						- 🕅 🕅
		1.2	SN-14	in sample bag)							
	-			120.7-124.2' - dark yellowish brown (10YR 4/4), dry, dense,	-					Headenace: 0	- 🕅 🕅
	-			Sandstone fragments are consolidated	_					= 20.9	
405	]			No Recovery	_					LEL = 0, $H_2S =$	
63.3	_			124.2-127.0'						VOC = 0 CO = 0	
	_				_						
	127.0				-						XX -
	127.0			No Recovery							N N -
	]			127.0-135.6'	_						
	-				-						V V -
					_						
130	_									Advence core	X X -
50.5	-				-					barrel with water	
	_				_					due to large	
	_	1.4	SN-15		-					rocks down hole;	- 12 12
	_				_					through dry.	
	_				_					Tried first 5 ft of	- 121
	-				-					washed away	- 🕅 🕅
135	1				_					after water	
53.3	-			Well Greeded Sand (SM)	_					recovery due to	22 -
	1			135.6-137.0' - dark vellowish brown (10YR 4/4), wet from	_					water use	
	137.0			drilling water, fine to coarse							
	-			Poorly Graded Sand (SP)	-						× × -
	_			to medium dense (drilling water - wetness), fine to	- son						
	-			medium-grained	-						- X X
140	_				_						
48.3	_			Clay (CL)	_			0.1			- X X
	-			140.3-141.4' - dark grayish brown (10YR 4/2), moist, stiff, littl	e _						88 -
1	1	10.0	SN-16	silt and fine-grained sand, low to no plasticity							
1	-			141.4-147.0' - dark gravish brown (10YR 4/2), moist. fine to	-						- 🕅 🕅
1	1			medium-grained sand, trace silt and clay	-						
1	-				_						
145	-				-		1		1		- 🕅 🖓
43.3	]				_			0.2			
1	-				-						- 🕅 🕅
1	147.0										- 🕅 🗧
1	_			Well Graded Sand (SW)	_		1			Stop at 147 on	
1	-			147.0-149.0 - dark grayish brown (10YR 4/2), moist, loose to medium dense, fine to coarse-grained sand, trace silt and fin	) _ e _					1/12/17, log/retrieve on	- 🕅 🕅
1	1			subangular gravel						1/13/17 (137' to	
150	-				_	///	1		1	147') Hard drilling	× × -
100							1				



BORING NUMBER: WI-CV-MW10-D

SHEET 6 OF 7

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SE of runway (436180.8 N, 1203179.8 E)

ELEVATION: 188.3 ft

DRILLING CONTRACTOR : Cascade Drilling

W	ATER/	LEVELS	S :		START : 1/10/17 14:15	END	: 1/1	6/17	17:00	)	LOGO	ER : N. Badon
D	EPTH B	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		(1)	Б		GS		
		INTERVA	AL (FT)				ĬŠ	L_	1			
			RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		BOLIC	hing Zone	space	e Hole	COMMENTS	WELL DIAGRAM
				SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYM	Breat	Head	Above		
+	38.3			#/11FE	Clay (CL)		///		0.3			
	-		10.0	SN-17	149.0-153.0' - yellowish brown (10YR 5/6), mottles, moist, sti low plasticity, trace silt	ff, _ - -						
	- - 155_				Clay (CL) 153.0-157.0' - gray (4/N), moist, stiff, low plasticity	-						
		157 0				-			0.2			
	- - - 160 28.3 - -	107.0			Silty Sand (SM) 157.0-157.6' - dark gray (4/N), moist, medium dense, fine-grained sand Poorly Graded Sand (SP) 157.6-165.3' - dark gray (4/N), moist, loose, fine-grained sand	d _						
	- - - 165_ 23.3 _ -	167.0	10.0	SN-18	Clay (CL) 165.3-166.7' - greenish gray (5GY 5/1), dry, stiff, no plasticity	- - - - - - - - - - - - - - - - - 			0.0		Stop 1/13/17 Start 1/15/17	
	- - - - - 18.3 _ - - - - - - - - -		10.8	SN-19	<ul> <li>Clay (CL)</li> <li>166.7-167.0' - black (10YR 2/1) to very dark brown (10YR 2/2), dry, medium, trace organics, peat-like</li> <li>Organic Soil/Peat (OL/PT)</li> <li>167.0-167.7' - very dark grayish brown (10YR 3/1) to very da brown, moist, very stiff, organic leaves and wood present</li> <li>Poorly Graded Sand (SP)</li> <li>167.7-174.0' - very dark grayish brown (2.5Y 3/2), moist, loos predominately fine-grained, traced oxidation mottling</li> </ul>	rk			0.0			
		177.0			Organic Soil (OL) 174.0-175.0' - very dark gray (10YR 3/1), slightly moist, very stiff, abundant wood fragments Poorly Graded Sand (SP) 175.0-177.0' - olive brown (2.5Y 4/3), moist, loose, predominately fine-grained, traced oxidation mottling Poorly Graded Sand (SP) 177.0-183.4' - very dark gray (2.5Y 3/1), moist, loose, fine an very fine-grained				0.0			
	180											



BORING NUMBER: WI-CV-MW10-D

SHEET 7 OF 7

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SE of runway (436180.8 N, 1203179.8 E)

ELEVATION: 188.3 ft

DRILLING CONTRACTOR : Cascade Drilling

2	WATER	LEVELS	S :		START : 1/10/17 14:15	END	: 1/1	<u>6/17</u>	17:00	)	LOGO	ER : N. Badon
	DEPTH I	BELOW S	URFACE	(FT)	SOIL DESCRIPTION		(1)	R	PID FADIN	GS		
		INTERV	AL (FT)				ğ				4	
					SOIL NAME, USCS GROUP SYMBOL COLOR		2	Zone	m		COMMENTS	WELL DIAGRAM
I			RECOV	ERT (FI)	MOISTURE CONTENT, RELATIVE DENSITY OR		BOL	guir	space	Hole		
I				SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		Ν	reath	lead	bove		
Ŧ				#/TYPE			ŝ	8	<u> </u>	A		
I	8.3	-				-						- 18
I	-					-					Drive casing	
I	-	1	11.1	SNI 20		-					down to 187' bgs	$\mathbb{X} \mathbb{X}^{-}$
I	_	-	11.4	311-20		_					after SN-21 then	
I	-					-					pull casing back	- 🕅 🕅
I	-	-			Organic Soil (OL)/Silt (ML)	_	$\approx$				hole with	- 🕅 🕅
I	_	1			183.4-186.7' - dark gray (2.5Y 4/1), slightly moist, very stiff,	_	$\approx$				bentonite to	
I	185				trace organic fibers throughout and trace oxidation	_	$\approx$				crease seal.	
I	3.3	-				-	$\approx$				CAsing pushed	K K -
I	-	-				-	$\approx$				bentonite	- 🕅 🕅
I	_	187.0			- Poorly Graded Sand (SP)		$\sim$					
I	_				186.7-187.0' - dark gray (2.5Y 4/1), moist, loose, little silt in	/-					187' and below	
1	-	4			lense	/ -		1	I	1	diameter casing	-Bentonite
	-	1			Silt (ML)	-		1			and 4" diameter	Chips -
I	_	1			187.0-109.0' - very dark gray (2.5Y 3/1), wet, stiff, trace fine sand sized mice flakes	_		1			core barrel	
I	190	-									Stop 1/15/17 Drilling with 4"	✓ 20/40 Sand
I	-1.0				Poorly Graded Sand (SP)						barrel x 6"	
I	-				190.5-195.9' - very dark gray (2.5Y 3/1), wet, loose, trace	-					casing	
I	_		89	SN-21	organics wood/branches ~3" long and fragments	_					Start 1/16/17	
I	-	-	0.0	0.1.2.		-					drv/no drilling	· · · · · · · · · · · · · · · · · · ·
I	-	-				-					mud	
I	_					_						
I						_						
I	195	-										·:日::1 -
I	-0.0 _					-						
I	_				No Recovery	_						Schedule -
I	-	197.0			195.9-197.0 Weed		$\sim$					80 - 0.010
I	-	-			197 0-198 0' - black (2 5Y 5/1), dry	-	$\approx$					Slot Screer
I	_				Silt (ML)		ĥí	>				
I	_	-			198.0-200.5' - dark gray (5Y 4/1), moist, very stiff, trace fine	_			0.0			지금지 [
I	200 -	-			sand, trace plant fibers	-						· · · · · · · · · · · · · · · · · · ·
I	-11.8	-										
	-	]			Silty Sand (SM)	_						
	_	-			200.5-203.0' - dark gray (5Y 4/1), wet, medium dense	-		1				승강 글리
	-	1	10.0	SN-22		-						
	-	1										-
	-				Silt (ML)	_		1				
	-	4			203.0-207.0' - dark gray (5Y 4/1), wet, very stiff, trace fine sand trace plant fibers	-		1	0.0			-
	205 -	1				-		1				-
	-16.8	]				_		1			Sample drilled	1999) - T
	-	-				-		1			1/16/17 and	<u></u>
1	-	207.0				-		1		1	core barrel on	-
	-				Bottom of Boring at 207.0 ft bgs on 1/16/17 17:00	_		1			1/18/17 /	1 1
						_		1				-
						-		1				-
						-		1				-
ŀ								1		1		
								1				
I.		1										1



WI-CV-MW10-M SHEET 1 OF 6

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SE of runway (436186.1 N, 1203182.9 E)

ELEVATION: 188.3 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Track Rig, 6" Casing, 4" Core Barrel

WAIER	LEVELS	:		START: 1/20/17 09:57	END	: 1/2	2/201	1		LOGG	ER : N. Badon
DEPTH E	BELOW SI	JRFACE (	FT)	SOIL DESCRIPTION				PID			
			. ,			8	R	ADING	38		
	INTERVA	L (FT)				U L	one				
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		5	ig Zo	ace	ele	COMMENTS	WELL DIAGRAM
				CONSISTENCY SOIL STRUCTURE MINERALOGY		ЧВ	athir	dsb	еH		
			SAMPLE #/TYPE			S	Bre	Heä	Abo		
188.3			#/TITE	Cleared with vac truck for utilities no soil description				_			
100.0_					-						
-				0.0 0.0	-	-					
_					-						$\bigotimes$
					_						
_					_						
_					_						- 12 12
-					-	-					X X -
	5.0				-	-					- 18
183 3	5.0			Boorly Graded Sand with Gravel (SB)				0.0		0 - 20.0%	
100.0				5 0-7 0' - dark gravish brown (2 5Y 4/2) moist loose	-					$0_2 = 20.370$	$\bowtie$
-		2.0	SN-1	predominately fine-grained trace fine rounded gravel	-						
_	7.0				_						
				No Recovery in Sample Barrel	_						
_				7.0-16.4'	_						
_					-						- 12
_					-	-					- 12
10 -					-	-					X X -
178.3											$\boxtimes$ $\boxtimes$ $-$
110.0_					-						
-					-						$\bowtie$
					_						
					_						
_					_						
-					-						X X -
-					-	-					- 🕅 🕅
15					-	-					KA KA -
173.3											$\otimes \otimes$ -
					-						
_		10.6	SN-2	Poorly Graded Sand with Gravel (SP)	_						
_		10.0	0112	16.4-18.0 - Very dark grayish brown (2.5 Y 3/2), moist, loose,	-			0.0			X X -
_											- 🕅 🕅
_				18 0.27 0' yory dark gravish brown (2.5V 2/2) slightly moid		•••					KA KA -
_				to dry (26-26.5') loose gravel is fine to coarse trace cobbles	<u> </u>		1				X X -
20 -				well rounded sand is fine to coarse	, _	••					
168.3						1::	]				
					_	1:::	1				
					_		ł				$\boxtimes$ $\boxtimes$ $\square$
-					-	:::	1				$\bowtie$
-					-	1::	1				K K -
-					-	•••	ł				$\neg$
-					-	1::	1				
-					-	1::	1				
25_					_		ł				
163.3					_	1:::	1				
_					-	••	ł				
-	27.0				-	:::	1				
-	21.0			Poorly Gradod to Wall Gradod Sand (SP SM)		••		0.0			- 🕅 🕅
-				27 0-43 5' - very dark gravish brown (2 5Y 3/2) moiet loose	-						
-				trace silt and cohesive sand/sandstone. trace gravel from	-						
-				27-27.5'	-	1					
					_	1					
30											
						1					



BORING NUMBER: WI-CV-MW10-M SHEET 2 OF 6

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SE of runway (436186.1 N, 1203182.9 E)

ELEVATION: 188.3 ft

DRILLING CONTRACTOR : Cascade Drilling

WATER	LEVELS	:		START : 1/20/17 09:57	END	: 1/22	2/201	7		LOGG	ER : N. Badon
DEPTH E	BELOW SU	JRFACE (	FT)	SOIL DESCRIPTION				PID			
			,			g	R	EADING	SS		
	INTERVA	L (FT)				Ľ	e				
		RECOVE		SOIL NAME, USCS GROUP SYMBOL, COLOR,		E	Zor	g	٥	COMMENTS	WELL DIAGRAM
		1120012		MOISTURE CONTENT, RELATIVE DENSITY OR		BO	hing	spa	유		
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		ΥM	reat	lead	avoc		
			#/TYPE			S	В	-	A		
158.3_					_						
_					_						
_					_						
_					_						
_					-			0.0			
_					-						
_					-						$\bowtie$
-					-						
35					-						
153.3											
					-						$\bigotimes$
_					-						
_		16 F	CN 2		_						
		10.5	511-5		_			0.0			
					_						
_					_						
_					_						
					_						
40											- K K
148.3					_						
-					-						- 12
-					-						
-					-			0.0			$\bowtie$
-					-						
-					-						
_				No Recovery		•					
_				43.5-47.0'	-						
45					_						
143.3											
					_						
_					_						
_	47.0										
-				Poorly Graded Sand with Gravel (SP)	-			0.0			
_				47.0-49.0' - dark gray (5Y 4/1), moist, loose, predominately	_						
-				fine-grained, trace coarse well rounded gravel, little slit	-						
-				Silt with Sand (ML)							$\otimes$ $\otimes$ -
50 -				49 0.56 0' - dark gravish brown (2.5X 4/2) dry with some	-						
138 3				slightly moist intervals loose very fine to fine sand some clea	an —						
				sand lenses							$\forall$ $\forall$ $\forall$
-					-						KA KA –
_					_						
					_			0.0			
_					_						
_					_						
_					_						
					_						
100 0											
133.3					-						- 12
				Silty Sand (SM)							
				56 0-60 0' - dark gravish brown (2 5Y 4/2) dry to slightly moi	st –						$\bowtie$
-		16.0	SN-4	loose sand is fine-grained little fine to coarse rounded grave	or,			0.0			$\bowtie$
-				seese, saine to into grainou, ittle into to obarde rounded grave	. –						
-					-						
-					-						
					_						
60											$\bowtie$



BORING NUMBER: WI-CV-MW10-M SHEET 3 OF 6

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SE of runway (436186.1 N, 1203182.9 E)

ELEVATION: 188.3 ft

DRILLING CONTRACTOR : Cascade Drilling

W	ATER	LEVELS	:		START : 1/20/17 09:57	END	: 1/2:	2/201	7		LOGG	ER : N. Badon
D	EPTH E	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		. U	R	PID EADIN	GS		
		INTERVA	AL (FT)		SOIL NAME LISCS GROUP SYMBOL COLOR		IC LO	Zone			COMMENTS	WELL DIAGRAM
			RECOVI	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		MBOL	athing 2	adspace	ve Hole	COMMENT	
				SAMPLE #/TYPE			SΥ	Bre	ΗË	Abo		
	28.3_ - - - - - -				Clay (CL) 60.0-63.0' - olive brown (7.5Y 4/3), slightly moist, very stiff, littl fine to coarse rounded gravel - fine sand form 62.5-63.0' No Recovery 63.0-67.0'	e						
1	65  23.3_ _					-						
1	- - - 70_ 118.3_ -	67.0			<b>Poorly Graded Sand (SP)</b> 67.0-72.5' - dark grayish brown (2.5Y 4/2), slightly moist, loose fine and very fine sand, little silt, trace fine subrounded gravel	- - - - - - -			0.0			- Bentonite - Grout - -
1	- - - 75 113.3_ -	77 0	10.0	SN-5	72.5-77.0' - pulverized rock and fine sand, trace fine to coarse gravel				0.0		Driller notes one big rock in last 7 ft of run ground up by Sonic bit	
1	- - - 80_ - 108.3_ - - - - -	11.0	10.0	SN-6	Poorly Graded Sand (SP) 77.0-83.5' - olive brown (2.5Y 4/3), slightly moist, loose, trace medium well rounded gravel				0.0		Hard drilling Headspace = 0.0 ppm (every 5 ft measured)	
1	85_  03.3_ - - - - - - - - - - - - - - - - - - -	87.0			Silty Sand (SM) 83.5-85.5' - very dark grayish brown (2.5Y 3/2), slightly moist, loose, sand is mostly fine-grained 85.5-86.0' - pulverized rock powder (drill action pulverized) Silt (ML) 86.0-87.0' - light olive brown (2.5Y 5/3), dry, hard, some oxidized mottling Silt (ML) 87.0-94.0' - olive brown with iron staining/mottled, slightly moist, very stiff, fine sand lense at 92.0-93.0'						Driving casing without drilling mud to check for water	
L												



BORING NUMBER: WI-CV-MW10-M SHEET 4 OF 6

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SE of runway (436186.1 N, 1203182.9 E)

ELEVATION: 188.3 ft

DRILLING CONTRACTOR : Cascade Drilling

WATE	R LEVELS	5 :		START : 1/20/17 09:57	END	: 1/2	2/201	7		LOGO	ER : N. Badon
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		U	R	PID EADIN	GS		
	INTERVA	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		опс го	ng Zone	ace	lole	COMMENTS	WELL DIAGRAM
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathir	Headsp	Above H		
98.3			#/TYPE		_		_		4		
	-	11.0	SN-7		-						
95 93.3				Poorly Graded Sand (SP) 94.0-97.0' - olive brown (2.5Y 4/3) and oxidized reddish, slightly moist, loose, sand is predominately fine-grained	-			0.0		Headspace = 0.0 ppm (every 5 ft measured)	
100_ 88.3	97.0			Poorly Graded Sand (SP) 97.0-98.5' - olive brown (2.5Y 4/3) and oxidized reddish, slightly moist, loose, sand is predominately fine-grained Silt (ML) 98.5-107.0' - olive brown with iron staining/mottled, slightly moist, very stiff, fine sand lense at 105.5-106.5'	-		-	0.0		Headspace 97- 102' VOC = 0.3 ppm	
105_ 83.3	- - - - - - - -	10.6	SN-8							Headspace 102- 107' VOC = 0.1 ppm	
110_ 78.3	107.0			<b>Silt (ML)</b> 107.0-111.0' - very dark gray (N 3/0) with dark yellowish brow mottling (10YR 4/4), slightly moist, very dense						Stop 1/20/17 Start 1/22/17 Headspace: 107-112 CO = 20 ppm VOC = 0.2 ppm	
115	115.0	9.0	SN-9	Silty/Clayey Fine Sand (SM/SC) 111.0-113.0' - dark yellowish brown (10YR 3/4), dry, medium dense, cohesive Poorly Graded Sand (SP) 113.0-115.0' - dark yellowish brown (10YR 3/4), dry, trace sil Silt (ML) lense at 115', dry	n  t,		· · · · · · · · · · · · · · · · · · ·	0.0			
73.3	-			Silty Sand (SM) 115.0-117.5' - light olive brown (2.5Y 5/2), dry, dense, predominately fine-grained Silt with Sand (ML) 117.5-120.0' - olive brown (2.5Y 5/2) with some oxidized mottling, dry, hard (siltstone), sand is fine-grained			· · ·			Headspace 115- 120' VOC = 0.1 ppm CO = 5 ppm	
120	-				_					Hard drilling	× × -



BORING NUMBER: WI-CV-MW10-M SHEET 5 OF 6

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SE of runway (436186.1 N, 1203182.9 E)

ELEVATION: 188.3 ft

DRILLING CONTRACTOR : Cascade Drilling

WAIE	R LEVELS	j∶		START : 1/20/17 09:57	END	: 1/2	2/201	7		LOGG	ER : N. Badon
DEPTH	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		0	R	PID EADIN	GS		
1	INTERV	AL (FT)				ĬĞ	0	1	-	1	
1	1			SOIL NAME, USCS GROUP SYMBOL, COLOR,		ЦС	Zoné	æ	Θ	COMMENTS	WELL DIAGRAM
		RECOVE	ERY (FI)	MOISTURE CONTENT, RELATIVE DENSITY OR		BOI	guir	spac	Ř		
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY	/	₹	reat	lead	pove		
		5.0	#/TYPE			ŝ	8	±	A		
68.3	-	5.0	SIN-10	No Recovery	-	-					- 🕅 🕅
	-			120.0-125.0	-						- 12 12
	-				-						- 🕅 🕅
	]				_						
	_				_						
	_				-	-					- 12 12
	-				-	-					K K -
125	125.0				-						V V -
63.3				Silty Sand (SM)						Hard drilling	
	]			125.0-130.5' - very dark gray (2.5Y 3/1), wet, medium dense	e, _					125-137', pull up	
	_			fine to coarse, trace fine gravel	-					sample and only	XX -
	-				-					rest fell out	- 🕅 🕅
	-				-					driller will attach	
1	]				_			L		a flapper bit to try	
1	_				_			L		to retrieve	
400	-				-		1	1		sample, the	K K -
130 58 3	-							L		come up was	$\otimes \otimes$ –
00.0	-	100	<u></u>	130.5-135.0' - pulverized rock powder, dark gravish brown		$\mathbb{R}$				wet, measured	
	-	12.0	SN-11	(2.5Y 4/2), dry	-	ťΧ	1			depth to water	
	]				_	$\mathbb{R}$				down hole at	
	_				_	Ю		0.0		124.5' While 127-	- 13 13
	-				-	K∕				still down hole	
	-				-	ťΧ	1				- 🕅 🕅
	-				-	$\mathbb{R}$				Headspace 125-	
135						$\mathbb{K}$				132'	
53.3	_			Silty Sand (SM)	-					CO = 8  ppm	- 12 12
	-			135.0-137.0' - dark gravish brown (2.5Y 4/2), dry, loose,	-						
	137.0			slightly moist lense	ivei, _						-
	107.0			¬ Silty Sand (SM)						Headspace 137-	Bentonite -
	]			137.0-137.3' - very dark grayish brown (10YR 3/2), trace	/_					142'	Chips -
	_			oxidized mottling, wet, medium dense, sand is fine to mediu	m / _					CO = 4 ppm	
	-			Poorly Graded Sand (SP)	-						20/40 Sand
140	-			137.3-150.0' - very dark gravish brown (10YR 3/2), color	-						-
48.3	-			loose fine-grained trace medium and coarse grains traces	silt —	1					
	]			lenses <0.1' thick, trace fine subrounded to rounded gravel	-						
1	-			,	_			L			
1	-				-			0.0			(1)日本(1)
1	-				-	1		<b>1</b>			· [ ] [ ]
1	1	12.0	CN 40		-			1			
1	]	13.0	SIN-12		_			1			
1	4				-			1			):目:1 -
145 43 2	-					•		1			2" —
-+0.0	-				-			1			Schedule -
1	1				-		·	1			
1	]				_	1		1	1		
1	4				_			1		Headspace 147-	
1	-				-		·	1		150'	[3日]31 -
1	-				-			1		00 = 9 ppm	::::目::::  -
1	-1				-		1	1			
150	1						·				
1											



BORING NUMBER:

WI-CV-MW10-M SHEET 6 OF 6

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : SE of runway (436186.1 N, 1203182.9 E)

ELEVATION: 188.3 ft

DRILLING CONTRACTOR : Cascade Drilling

WAT	ER LEV	ELS : -			START : 1/20/17 09:57	END	: 1/22	2/201	7		LOGG	ER : N. Badon
DEPT	H BELO\	V SURF	FACE (F	T)	SOIL DESCRIPTION		U	R	PID EADING	GS		
	INTE	RVAL (	(FT)		SOIL NAME, USCS GROUP SYMBOL, COLOR,		пс го	Zone	æ	e	COMMENTS	WELL DIAGRAM
				SAMPLE	MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		YMBO	eathing	eadspac	ove Hol		
38.3	³ _ 150 - - - - - - - -	.0		#/TYPE	Clay (CL) 150.0-155.0' - olive brown (2.5Y 4/3) with oxidized mottling, changing to very dark greenish gray (5GY 3/1) and very dark gray (N 3/0) at 152.5', wet, very stiff, becoming silty/very fine sandy clay at 154-155'		s	B	0.0	A		
155	155	.0										
33.	3				Bottom of Boring at 155.0 ft bgs on 1/22/2017						Stop 1/22/17 Bottom of hole = 155 ft	

### BORING NUMBER:

WI-CV-MW11-M SHEET 1 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (443696.2 N, 1199632.0 E)

#### ELEVATION: 202.1 ft

DRILLING CONTRACTOR : Cascade Drilling

PROJECT NUMBER:

DRILLING METHOD AND EQUIPMEN	T :
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WATER	LEVELS	;		START : 1/25/2017	END	: 2/1/	2017			LOGG	ER : G. Warren
DEPTH E	BELOW SI	URFACE (	FT)	SOIL DESCRIPTION		g	R		GS		
	INTERVA	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		30LIC LC	ing Zone	pace	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above		
202.1_    										Begin 12:45	
	5.0				-						
5 197.1_ - - - - - - -	5.0			Well Graded Sand with Silt and Gravel (SW-SM) 5.0-20.0' - dark brown (7.5YR 3/3), moist, fine to coarse, 3" minus	-						
10 192.1_   		8.7	SN-1	- weakly cemented at 12-14' - orange layer - color change to dark gray (10YR 3/1), dry	- - - - - - -						
15	15.0				_						
187.1    182.1 		4.0	SN-2	Well Graded Sand with Gravel (SW) 20.0-24.0' - dark grayish brown (10YR 4/2), moist, fine to coarse		·~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				Driller noted easy drilling 15- 20' (sand?)	
- - - - - - - - - - - - - - - - - - -	25.0	5.2	SN-3	Poorly Graded Gravel with Sand 24.0-27.0' - gray (10YR 4/1), dry, 4" minus round, fine sand Poorly Graded Sand with Gravel (SP) 27.0-30.0' - brown (10YR 3/3) but more gray at 29-30', dry, loose, fine-grained, 1" cobble	- - - - - - - - - - - - - - - - - - -						
30					-						
											YA LYA

## BORING NUMBER:

WI-CV-MW11-M SHEET 2 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (443696.2 N, 1199632.0 E) DRILLING CONTRACTOR : Cascade Drilling

PROJECT NUMBER:

#### DRILLING METHOD AND EQUIPMENT :

ELEVATION: 202.1 ft

<u>WATER</u>	LEVELS	:		START : 1/25/2017	END :	: 2/1/	<u>2017</u>			LOGO	ER : G. Warren
DEPTH E	BELOW S	URFACE (	FT)	SOIL DESCRIPTION				PID	20		
		(	,			90	R	EADING	3S		
	INTERVA	AL (⊢T)				C	one				
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		U I	jg Z(	ace	<u>e</u>	COMMENTS	WELL DIAGRAM
				CONSISTENCY, SOIL STRUCTURE, MINERALOGY		MB	athir	dspe	е н Н		
			SAMPLE #/TYPE			S	Bre	Τe	Abo		
172.1	30.0			Well Graded Sand with Silt		°l∘¦∙					M M
_				30.0-35.0' - dark gray (10YR 3/1), cemented	_	l • • •					
					_	ام ام					
_					_						N N -
-					-	l° °¦+					XX -
-					-						- 🕅 🕅
-					-						
_					_	l l l l l l l l l l l l l l l l l l l					
35		70	SN-4								
167.1_		7.0		Poorly Graded Sand with Gravel (SP)	. –						KI KI –
_				35.0-44.0' - brown (10YR 4/3), dry, loose, fine, rounded grave	i _						- 12 12
-					-						X X -
-					-						N N -
					-						
_					_						- 12 13
-					_						- 12 12
40	40.0				_						- 🕅 🕅
162.1										No recovery -	
										sand washed out	
_					_						- 12 12
-					_						KA KA -
-					-						- 12 12
-					-						
					_						
				Poorly Graded Sand (SP)						Forgot to take	X X -
45		7.3	SN-5	44.0-50.0' - dark brown (10YR 3/3), dry, fine-grained, couple	ot					picture of this	$\otimes \otimes -$
157.1				gravel pieces	-					run	XX -
-					_						- 🕅 🕅
					_						
_					_	11					X X -
-					_						- 🕅 🕅
-					-						Ka Ka -
-					-						
50_	50.0										
152.1				Poorly Graded Sand (SP)	_						N N -
-				50.0-65.0' - dark brown (10YR 3/3), dry, fine-grained,	, –						X X -
-				and 62-63'	· _						- 🛛 🖓
-					_						
_					_						XX -
-					-						- 🕅 🕅
55					-						- 🕅 🕅
147.1		6.5	SN-6								
-					_						KA KA -
-					-						- 🕅 🕅
					-						KA KA -
					_						N N -
e0 -					_						- 18
00						<u></u>		-			kvi kvi

## BORING NUMBER:

WI-CV-MW11-M SHEET 3 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (443696.2 N, 1199632.0 E)

ELEVATION: 202.1 ft

DRILLING CONTRACTOR : Cascade Drilling

PROJECT NUMBER:

DRILLING METHOD AND EQUIPMENT	1
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WATER	LEVELS	:		START : 1/25/2017 END : 2/1/2017						LOGGER : G. Warren		
DEPTH E	BELOW S	JRFACE (	FT)	SOIL DESCRIPTION		Ð	R	PID EADING	GS			
	INTERVA	AL (FT) RECOVE	RY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT. RELATIVE DENSITY OR		SOLIC LC	ing Zone	pace	Hole	COMMENTS	WELL DIAGRAM	
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above I			
142.1_             	60.0	8.0	SN-7	Poorly Graded Sand (SP) 65.0-70.0' - like above, few gravel pieces (SP)								
	68.0											
70 132.1_ - - - - - -		8.1	SN-8	Poorly Graded Sand (SP) 70.0-80.0' - like above								
75 127.1_   	75.0			- at 76 and 79', layers of Silty Sand (SM), with organics						At 1630 stop at 75' Resume 1/30/17		
80 122.1_    		10.0	SN-9	Poorly Graded Sand (SP) 80.0-87.0' - dark brown (10YR 3/3), dry, loose, fine, increasing 1/4" silty seams below 83° laminations	g			0				
85_ 117.1_ 	85.0			Dearty Craded Sand (CD)				0				
- - - - 90_				87.0-96.5' - dark brown (10YR 3/3), dry, loose, fine-grained, beach sand, silt laminations				,				

### BORING NUMBER:

WI-CV-MW11-M SHEET 4 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (443696.2 N, 1199632.0 E)

ELEVATION : 202.1 ft

DRILLING CONTRACTOR : Cascade Drilling

PROJECT NUMBER:

DRILLING METHOD AND EQUIPMENT	1
-------------------------------	---

WATE	WATER LEVELS :			START : 1/25/2017 END : 2/1/2017				LOGGER : G. Warren			
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		ġ	RI	PID	3S		
	INTERV	AL (FT)				IC LO	one			COMMENTS	WELL DIAGRAM
		RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		<b>IBOL</b>	thing Z	dspace	e Hole	COMMENTS	
			SAMPLE #/TYPE	CONSISTENCE, SOIL STRUCTURE, MINERALOGE		SYN	Brea	Hear	Abov		
112.1	-	10.0	SN-10		-						- 18
	_				_						
					_						
	-				-						- 18
	-				_						
95	95.0				_						
107.1					_						
	-			Silty Sand (SM)		Ш		0			- 2
	-			96.5-97.5' - dark gray (2.5Y 4/1), dry, fine-grained							
	-				_						
	_				_						
100 102.1		9.2	SN-11	Sand (SP)	-						
	-			100.0-113.0' - dark brown (10YR 3/3), dry, loose, fine-grained below 103' very fine with silty laminae	, _			0			- 18
	-				_						
	_				_						
	-				-						
105	105.0				_						
97.1				- back to (SP) to 105'							
					_						
	-				_						
	-				-			0			- 🕅
					_						
110	_	9.0	SN-12								
92.1			-		_						
	-			- very fine (SP) layer	-						- 18
					_					Driller noted	
				Poorly Graded Sand (SP)						cuty uning	
	_			well-sorted sand	_						
115_ 87.1	115.0										
	-				_						
					_						
	-				_						
	-	7.0	SN-13		-			0			- 🕅 🕅
120	-			- Poorly Graded Sand (SP), like above	_						
120	1										YA 1YA

## BORING NUMBER:

WI-CV-MW11-M SHEET 5 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (443696.2 N, 1199632.0 E)

ELEVATION : 202.1 ft

DRILLING CONTRACTOR : Cascade Drilling

DRILLING METHOD AND EQUIPMENT	1
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WATER	LEVELS	:		START: 1/25/2017 EN	ND :	2/1/	2017			LOGG	ER : G. Warren
DEPTH E	BELOW S	JRFACE (	FT)	SOIL DESCRIPTION				PID			
		,	,		-	00	R		38		
	INTERVA	L (FT)				Ц С	ne				
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		Г	j Zo	8	<u>e</u>	COMMENTS	WELL DIAGRAM
				MOISTURE CONTENT, RELATIVE DENSITY OR		BC	thing	lspa	오		
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		Υ	reat	leac	9AOC		
			#/TYPE			ŝ	В	1	A		
82.1 _					_						
					_						
_					_						
_					_						
_	122.5			<ul> <li>at 122.0', cemented silty sand layers</li> </ul>	_					Stiff drilling	
_					_[	$\mathbb{C}^{n}$				122.5-125' - no	
_					_[					recovery	
_					_						
					_						
125	125.0				_						
77.1				Sand with Silt (SP-SM)	_	불분					
_				125.0-130.0' - very dark gray (2.5Y 3/1), dry, loose, fine to very	_	불분					
_				fine	_						
_					_	宇宙					X X -
_					_	다는					
_					_	111					- 12
-					-	다.					N N -
_					-	금류		0.1			
400					-	뷥뉨		0.1			- 12
72 1		10.0	SN-14	Dearly Creded Cand (CD)		цЦ,					> > > > > > > > > > > > > > > > > > >
12.1				120.0.125.0' dork brown (10VD 2/2) dry lesses fine grained	-						- 12
_				130.0-135.0 - dark brown (10 fR 3/3), dry, loose, line-grained,	-					Drillor noted	- 12
_				same as previous (SP)	-	e je					- 12
-					-					drilling but stiff	K K -
-					-					at 125'	- 12
-					-					at 155	- 12
-					-						- 12
-				comented silt lenses at 13/	-						- 12
135	135.0			- cemented sintenses at 134	-[	$\mathcal{I} \in \mathcal{I}$					
67.1	100.0			Interbedded Silt/Fine Sand		TT					
•···· _				135 0-139 4' - Lacustrine sediment	-						
_					-1						
_					_						
_					-1						
_											
_						· · · ·					
											$\bigotimes$
140		10.0	SN 15	Lean Clay (CL)							
62.1		10.0	5IN-15	139.4-143.0' - dark gray (GLEY1 4/N), dry, hard, interbedded	_[	///					
_				silt	_	///					
_					_[						
_						///					
_											
_						<u>///</u>					
_				Poorly Graded Sand (SP)	[						
_				143.0-150.0' - dark brown (GLEY1 4/N), moist, fine, silty lenses	_						$\bowtie$
	445.0				_	$(\cdot, \cdot)$					$ \otimes \otimes $ -
145	145.0				_					01	
57.1					_					Stop at 145 for	- 12
-					_					uay	
-					-						$\boxtimes$ $\boxtimes$ -
-					[						- 22
-					-						
-					-	. · `.:					
-					-ł						
-					-						
150					-						-
					-						

## BORING NUMBER:

WI-CV-MW11-M SHEET 6 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (443696.2 N, 1199632.0 E)

ELEVATION: 202.1 ft

DRILLING CONTRACTOR : Cascade Drilling

PROJECT NUMBER:

#### DRILLING METHOD AND EQUIPMENT :

WATER	LEVELS	:		START : 1/25/2017			2/1/2017			LOGG	LOGGER : G. Warren	
DEPTH E	BELOW S	JRFACE (	FT)	SOIL DESCRIPTION		U	RI	PID EADING	GS			
	INTERVA	ll (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		SOLIC LO	ing Zone	space	Hole	COMMENTS	WELL DIAGRAM	
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above			
52.1 _ _ _	150.0		<i>m</i> 111 L		-			0			Bentonite Chips -	
- - - 155 - 47.1 - - - - - - - - - - - - - - - - - - -		10.0	SN-16				0	0				
100	160.0				-							
160 42.1 - - - - - - - - - - - - - - - - - - -	160.0	10.0	SN-17	Poorly Graded Sand (SP) 160.0-170.0' - very dark gray (GLEY1 3/N), wet, fine-grained no fines	, 			0			2" Schedule - 80 - 0.010 Slot Screen	
170	170.0				-							
32.1 _ - - - - - - - - - - - - - - - - - - -	175.0	6.0	SN-18	Poorly Graded Sand (SP) 170.0-200.0' - very dark gray (GLEY1 3/N), moist, very stiff to hard, low plasticity, massive, contains very fine sand	0 – – – – –		0	0				
27.1 		0.0	SN-19							No recovery		
180												

## BORING NUMBER:

WI-CV-MW11-M SHEET 7 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (443696.2 N, 1199632.0 E)

#### ELEVATION: 202.1 ft

DRILLING CONTRACTOR : Cascade Drilling

PROJECT NUMBER:

#### DRILLING METHOD AND EQUIPMENT :

WATER	LEVELS	:		START: 1/25/2017	END :	2/1/	2017			LOGG	ER : G. Warren
DEPTH E	BELOW SU	JRFACE (	FT)	SOIL DESCRIPTION				PID	2		
			,			00	R	ADING	55		
	INTERVA	RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		OLIC L	ig Zone	ace	ole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathir	Headsp	Above H		
22.1	180.0		E								
	100.0									Loose soil fell out	
185 17.1  		0.0	SN-20	- interbedded to very loose, wet, fine sand							
- - - - - - - - - - - - - - - - - - -											
_ _ 195_ 7.1 _	195.0										
	200.0	0.0	SN-21	- fine sand/silt/clay on auger bit							
2.1 _ _ _ _ _ _ _ _ _				Silt (ML) 200.0-205.0' - dark greenish gray (GLEY 1 4/1), moist, very stiff, low plasticity, massive						Drill to 200', loose - fell out Wash/clean hole to 200', 4" core Casing at 200' - run to 206' Soil 203-206'	
205 -2.9 - - - - - - - - - - -		15.0	SN-22	Lean Clay (CL) 205.0-212.0' - dark greenish gray (GLEY1 4/1), moist, very s to hard, medium plasticity	tiff _ - - - -			0			
210											

## BORING NUMBER:

WI-CV-MW11-M SHEET 8 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (443696.2 N, 1199632.0 E)

#### ELEVATION: 202.1 ft

DRILLING CONTRACTOR : Cascade Drilling

PROJECT NUMBER:

DRILLING METHOD AND EQUIPME	NT :
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WA	WATER LEVELS :				START : 1/25/2017	END : 2/1/2017				LOGGER : G. Warren		
DEF	PTH E	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		g	R	PID EADIN	GS		
		INTERVA	AL (FT)				IC LO	one			COMMENTS	WELL DIAGRAM
			RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		IBOLI	thing Z	dspace	e Hole	COMMENTS	
				SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYN	Breat	Head	Above		
-7	'.9 _					_						-
	-					_						
	_				Silt (ML)							-
	-				212.0-214.0' - dark greenish gray (GLEY 1 4/1), dilatant	_						
	-					_	$\prod$					
2'	15 -	215.0			Lean Clay (CL) 214.0-262.0' - dark greenish gray (GLEY1 4/1), moist, very st	iff –						-
-12	2.9_				to hard, plastic, massive, some interbedded siltier zones	-					Stop at 215' for	
	-					_					resume with 4"	
	-					-					core from 215'	-
	-					_						
	-					-						
22	20 -					-						-
-17	7.9_					-			0			
	-					-						
	-		15.0	ONL 00		-						-
			15.0	5IN-23		-					Nowator	
	-					_					bearing zones	-
22	25					_						(한) -
-22	2.9					-						
						-						
	_					-						-
	-					_						
						-						-
23	30 -	230.0				-						-
-27	7.9				- continued Clay to Silty Clay (CL-ML)	-						
						_					Dilatant seams of	
	-					-					silt	-
						-						-
						_						-
23	35 -		10.0	CNI 04		-						-
-32	2.9_		10.0	5IN-24		-						
	-					-						
	-					-						-
	-					-						
	-					_						
24	40 -											

## BORING NUMBER:

WI-CV-MW11-M SHEET 9 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (443696.2 N, 1199632.0 E)

ELEVATION : 202.1 ft

DRILLING CONTRACTOR : Cascade Drilling

PROJECT NUMBER:

DRILLING	METHOD	AND EC	UIPMENT	1

WATER	R LEVELS	3:		START : 1/25/2017	END : 2/1/2017				LOGGER : G. Warren		
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		9	RI	PID EADIN	GS	1 1	
	INTERV	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		огіс го	ng Zone	ace	lole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathir	Headsp	Above H		
-37.9 245 -42.9	240.0	10.0	SN-25	- same as above							
250 -47.9	250.0			- continued Clay to Clay/Silt (CL-ML)	-					Elevation = -50' msl	
255 -52.9		15.0	SN-26	- contains very fine sand (still clay)/plastic, very stiff to hard						Not a water	
260 -57.9					-						
265	265.0			Clay/Silt with Sand (CL-ML) 262.0-265.0' - dark greenish gray, slightly moist, low plasticit hard, massive, very fine sand, volcanish ash?	y, _ _ _ _						
-62.9				Bottom of Boring at 265.0 ft bgs on 2/1/2017						Total Depth = 265' 1630; 2/1/17	



BORING NUMBER: WI-CV-MW11-S

SHEET 1 OF 5

## SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (443692.1 N, 1199626.4 E)

ELEVATION: 202.0 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : RotoSonic, Terrasonic Short Stroke with 4" x 6" Core Barrel

PROJECT NUMBER:

WATER LEVELS : ---START : 2/6/17 13:36 END : 2/1/2017 LOGGER : J. Frank DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole Breathing 2 MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 202.0 Cleared with air knife 0.0 0.0-5.0' SN-1 0.0 5 5.0 197.0 Well Graded Sand with Gravel (SW) 0.0 5.0-13.0' - dark yellow brown (10YR 3/4) to gray brown (10YR 3/2), moist, loose, gravel rounded 1-3", fine to coarse sand SN-2 3.0 0.0 8.0 0.1 10 192.0 5.0 SN-3 0.0 13.0 Well Graded Sand with Gravel (SW) 0.0 13.0-34.0' - dark brown (10YR 4/1), dry, dense in spots, mainly loose, fine to coarse sand 15 187.0 5.0 SN-4 0.0 18.0 0.1 20 - same as above with larger gravel-cobble sized cemented 182.0 (SM-SW) at 19.5' 6.5 SN-5 0.0 0.1 25 177.0 28.0 0.1 30



BORING NUMBER: WI-CV-MW11-S

SHEET 2 OF 5

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (443692.1 N, 1199626.4 E)

ELEVATION: 202.0 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : RotoSonic, Terrasonic Short Stroke with 4" x 6" Core Barrel

WATER LEVELS :			START : 2/6/17 13:36	END	: 2/1/	2017		LOG	GER : J. Frank		
DEPTH E	BELOW S	JRFACE (	FT)	SOIL DESCRIPTION		U	R	PID EADING	SS		
	INTERVA	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		MBOLIC LC	eathing Zone	adspace	e COMMENTS	WELL DIAGRAM	
470.0			#/TYPE	· · ·		ς	Bre	Η	Abc		
				- thin 0.3' silt lense (ML) (5Y 3/2)	-	-					
-		9.0	SN-6	Poorly Graded Sand with Gravel (SP)	-		0.0	0.4	LEL = 4	-	
35_ 167.0_ -				34.0-45.5' - dark gray brown (10YR 3/2), moist, 15-20% grav subround to round, fine sand	/el, 						
-	38.0				-			0.4		-	
40 162.0_ - - -											
- - 45_ 157.0_		10.0	SN-7	Poorly Graded Sand (SP)			0.0	0.1			
-	48.0			45.5-48.0' - dark grayish brown (10YR 3/2-2/2), dry, loose, fil sand Poorly Graded Sand with Gravel and Trace Cobble (SP)	ne _ 	-		0.0			
- 50_ 152.0_ - - - -		10.0	SN-8	48.0-53.0' - dark grayish brown (10YR 3/3), dry, loose, fine sands	- - - - - - - - - - -						
 55 147.0_		10.0		Poorly Graded Sand with Gravel and Trace Cobble (SP) 53.0-55.5' - same as above but smaller gravel (angular)	-		0.0				
	58.0			Poorly Graded Sand (SP) 55.5-58.0' - dark grayish brown (10YR 2/2), dry, loose, fine sands	-					-	
60				Poorly Graded Sand with Gravel (SP) 58.0-65.0' - dark grayish brown (10YR 3/2), dry, loose, fine sands, cobble at bottom	-			c	0.0		



WI-CV-MW11-S

SHEET 3 OF 5

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (443692.1 N, 1199626.4 E)

ELEVATION: 202.0 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : RotoSonic, Terrasonic Short Stroke with 4" x 6" Core Barrel

PROJECT NUMBER:

WATER LEVELS :					START : 2/6/17 13:36	END : 2/1/2017 LOGGER : J. Frank			ER : J. Frank			
DEPTH BELOW SURFACE (FT)					SOIL DESCRIPTION	() PID READINGS			35			
					SOIL NAME, USCS GROUP SYMBOL, COLOR,		TIC LOC	Zone			COMMENTS	WELL DIAGRAM
			RECOVE	SAMPLE	MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMBO	Breathing.	Headspace	Above Hole	00	
┢	142.0_			#/TIFE		_				-		
	65_ 137.0_ -		10.0	SN-9	Poorly Graded Sand with Gravel (SP) 65.0-69.3' - dark grayish brown (10YR 3/2), dry, loose, fine sands			0.5	0.1			- - - - - - - - - - - - - - - - - - -
	_	68.0				_			0.1			-
	- 70_ 132.0_ - - - - - - 127.0_ - - - - - - - - - - - - - - - - - - -		10.0	SN-10	- same as above Silt (SM-ML) lense 0.2' thick 63.3-69.5' - dry, medium dense Poorly Graded Sand with Gravel (SP) 65.9-71.7' - dark gray brown (10YR 3/2), dry, loose, fine sand Poorly Graded Sand (SP) 71.7-78.0' - dark brown (10YR 2/2), dry, loose, fine sands			0.0	0.2			- - - - - - - - - - - - - - - - - - -
	80 122.0  85 117.0	88.0	10.0	SN-11	<ul> <li>Poorly Graded Sand with Gravel (SP) (0.5-2") 78.0-80.4' - dark grayish brown (10YR 3/2), dry, loose, fine sands</li> <li>Poorly Graded Sand (SP) with Interbedded Thin Silt Len 80.4-104.0' - dark brown (10YR 3/2), dry, loose, fine sands</li> </ul>	Ses		0.0	0.0			- - - - - - - - - - - - - - - - - - -
	-					_						-
	90					-						_



BORING NUMBER: WI-CV-MW11-S

SHEET 4 OF 5

## SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (443692.1 N, 1199626.4 E)

ELEVATION: 202.0 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : RotoSonic, Terrasonic Short Stroke with 4" x 6" Core Barrel

WATER	LEVELS	:		START : 2/6/17 13:36	END	: 2/1/	2017			LOGG	ER : J. Frank
DEPTH B	BELOW S	JRFACE (	FT)	SOIL DESCRIPTION			PID READINGS				
						90			SS	4	
	INTERVA	NIERVAL (FI)				СГ	one				
		RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		DL D	ng Z	pace	9e P	CONNENTS	
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		ĂB	eathi	eads	ovel		
			#/TYPE			٢S	B	Ť	Ab		
112.0_					_						_
_					-						-
-					-						-
-					-						-
		10.0	SN 12		_						
		10.0			_		0.0	0.1			-
-					-						-
95 -					-						-
107.0					_						
-					_						_
-					-						-
-					-						-
_	98.0				_						_
_				- color change (10YR 4/2)	_			0.0			_
-					-						-
100 -					-						=
102.0											
					_						-
_					-						-
-					-						-
-		10.0	01140		-						-
		10.0	SN-13		_		0.0	0.1			-
-											-
105				104 0-109 4' - dark gravish brown (10YR 4/2) dry loose ver							-
97.0				fine to fine sand	- y						
_						_					
					-						-
-					-						-
-	108.0				-						-
					_			0.0			-
-					_						-
110 -				_ Silt (SM-ML)	_	ΠÌ					-
92.0				109.4-109.75'- with trace very fine sand, 2.5Y 4/1 dark gray,	+						
				dry, medium dense							
-				Poorly Graded Sand (SP)							-
-				fine sand silt lense at 110 2-110 0'	ery _						-
		10.0	01.44		-						-
		10.0	SN-14		_		0.0	0.1			-
					_						-
115					-						-
87.0											
					_						
_					_						-
-					-						-
-	118.0				-						-
				Silty Sand (SM)	_			0.3			-
_				118.0-119.5' - dark brown (2.5YR 4/2), moist, dense, very fin	ne _						-
120				to tine sands							-
120						· · · ·		-			



BORING NUMBER: WI-CV-MW11-S

SHEET 5 OF 5

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (443692.1 N, 1199626.4 E)

ELEVATION: 202.0 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : RotoSonic, Terrasonic Short Stroke with 4" x 6" Core Barrel

WAIER	LEVELS	5:		START: 2/6/17 13:36	END	2/1/	2017			LUGG	ER : J. Frank
DEPTH BELOW SURFACE (FT)				SOIL DESCRIPTION		(1)	R		38		
						ŏ					
		·= (i i)				10	one			COMMENTS	WELL DIAGRAM
		RECOVE	ERY (FT)	MOISTURE CONTENT RELATIVE DENSITY OR		Ы	ng Z	pace	9e		
				CONSISTENCY, SOIL STRUCTURE, MINERALOGY		MB	athi	ads	ve F		
			#/TYPE			S∖	Ĕ	Ъ	Abc		
82.0				Poorly Graded Sand (SP)							
	]			119.5-127.6' - dark brown (2.5Y 4/3), dry, loose, very fine sar	nd _						
											_
_					_						_
-	-				-						-
		10.0	SN-15		_		0.0	0.1			-
	-				_	1.1.	0.0	0.1			-
					-						-
125					-						-
77.0											
					_						_
					_						_
					_						_
	100.0				_						-
	128.0			Sandy Silt (SM)	_	Ш		01		Pap 20 ft of core	-
	1			\127.6-128.0' - dark brown (2.5Y 3/2), moist, medium dense	_/-			0.1		harrel to collect	-
	1			Poorly Graded Sand (SP)	_					128-140' run	-
130	1			128.0-130.5' - dark brown (2.5Y 4/3), moist, loose, very fine to	0 –						-
72.0	1			III le Saliu							
-	1			¬ Sandy Silt (SM)							_
				\ 130.5-130.7' - dark brown (2.5YR 4/2), dry, medium dense,	/]						_
_				very fine sand							_
-	-			Poorly Graded Sand (SP)	_						-
-	-			130.7-136.0' - dark brown (2.5Y 4/3), moist, loose, very fine to	0_						-
				fine sand	-						-
-	-	12.0	SN-16		-		0.0				-
135					-						-
67.0								0.2			
					_	te îr					-
				Sandy Silt (SM)							
				136.0-140.0' - dark brown (2.5YR 4/2), moist, medium dense							_
-	-				_						-
					-			0.1			-
					-			0.1			-
					-						-
140	140.0				-						-
62.0				Bottom of Boring at 140.0 ft bas on 2/1/2017		<u>нч</u> .					
					_						
1											
1					_						-
1					_						-
1					-						-
1					-						-
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1					-						-



#### BORING NUMBER: WI-CV-MW12-D

SHEET 1 OF 7

## SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : South End of Field (433269.9 N, 1204130.8 E)

ELEVATION: 186.9 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Tracking Rig, 8" Diameter Casing, 7" Core Barrel, 6" Casing, 4" Barrel

WATER LEVELS :				START : 1/24/17 14:05	END	: 1/2	<u>6/17   </u>	15:45	5	LOGG	ER : N. Badon
DEPTH	DEPTH BELOW SURFACE (FT)			SOIL DESCRIPTION		PID					
1			,			8	R		έS		
	INTERV	AL (FT)				Г О	one				
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		Ĕ	g Zc	ace	e	COMMENTS	WELL DIAGRAM
				MUISTURE CONTENT, RELATIVE DENSITY OR		βğ	athin	dsp	е Н		
			SAMPLE			λ	Brea	Hea	Abov		
186.0			#/ITPE	Cleared to 5' with yea truck no description			_		ì		
100.0	-			cleared to 5 with vac truck, no description	-						N N -
-	-				-	·					- 12
-					_						- 🕺 🕅
					_						
					_						KAKA -
-	_				_						- KA KA
-	-				_						X X -
					-						- 12 12
181 0	5.0			Wall Creded Sand with Crevel (SW)				0.0			
101.9	-			5.0.7.0' very dark grav (10VP 3/1) moist loose fine to coar	-			0.0			- 🕅 🕅
-	-	3.0	SN-1	sand and fine to coarse-grained gravel trace silt	se _						- 🕅 🕅
-	7.0			Sana and fine to course graned gravel, have sin	-						
-				Well Graded Sand (SW)				0.0			$\otimes$ $\otimes$ -
				7.0-14.0' - very dark gray (2.5Y 3/1), moist, loose, trace silt							
				toward 14'	_						$\bowtie$
- I	_				_						X X -
	-				_						K K -
176 0	-										- Ka Ka
170.9	-				-						KA KA -
-	-				-						- 18
-	-				-	·					- 12
-	-				-			0.0			- 🕅 🕅
-					_						$\bowtie$
-	1				-						
		80	SN-2								
	_	0.0	014-2	Well Graded Sand with Gravel (SW)	_						X X -
15	-			_ 14.0-15.0' - very dark gray (2.5Y 3/1), moist, loose, fine to	7						$\bowtie$ $\bowtie$ $-$
1/1.9	-				_/ -						XX -
	-			No Recovery	-						- 🕅 🕅
-	17.0			15.0-17.0	-						- 🕅 🕅
-	17.0			Well Graded Sand with Gravel (SW)				0.0			X X -
-	-			17.0-21.5' - very dark grav (2.5Y 3/1), moist, loose, fine to	-	·					N N -
-				coarse sand and fine to coarse rounded gravel	-						
				6							$\bigotimes$
	1				_		l I				
20	4				_	I	l I				K K _
166.9					_		l I				- 12 12
	21.0				-						KA KA -
	-			Boorly Gradod Sand (SP)							- 124 124
-	-	6.5	SN-3	21 5-23 5' - dark gravish brown (2 5¥ 4/2) dry loose fine to	-						- 12
-	1			medium-orained, trace silt	-						× × -
	1				-						
	]			No Recovery		È	1				KI KI -
	_			23.5-27.0'	_		l I				
25	1					I I	l I				
161.9	4				_		l I				- 🕅 🕅
	-				-		l I				- 12 12
	27.0				-		l I				Ka Ka -
	21.0			Woll Gradod Sand (SW)		<b>—</b>	1	0.0			- 🕅 🕅
	1			27 0-37 0' - very dark grav (2 5V 3/1) slightly moist losse fir	- 10		l I				KA KA -
-	1			to coarse rounded gravel			l I				
I -	1				-	1	l I				
1	]				_		l I				$\bowtie$
30											


WI-CV-MW12-D

SHEET 2 OF 7

# SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : South End of Field (433269.9 N, 1204130.8 E)

ELEVATION: 186.9 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Tracking Rig, 8" Diameter Casing, 7" Core Barrel, 6" Casing, 4" Barrel

V	ATER LEVELS : EPTH BELOW SURFACE (FT)			START : 1/24/17 14:05	END	: 1/26	<u>6/17</u>	15:45	5	LOGO	ER : N. Badon	
1	DEPTH B	EPTH BELOW SURFACE (FT)		(FT)	SOIL DESCRIPTION		6	P		28		
							ğ	, rt				
		RECOVERY (FT)					2	Zone			COMMENTS	WELL DIAGRAM
			RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		30L	ing 2	pace	Hole		-
				SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		ΧWE	reath	leads	Dove		
T				#/TYPE			ώ	ā	Ľ	At		
	156.9					-						- 🕅 🕅
	-					-						XX -
	-		10.0			-						- 🕅 🕅
			10.0	SN-4		_			0.0			
	_					_						K K -
	_					-						- 🕅 🕅
	_					-						K K -
	35					-						
	151.9					_						
	-					-						99 - 19
	_	37.0				-						X X -
	-	07.0			Well Graded Sand (SW)						Low recoverv	- 🕅 🕅
	-				37.0-38.0' - very dark gray (2.5Y 3/1), moist, loose, little fine	to _					due to sand and	
	-				coarse rounded gravel	/-					bags larger than	- 18
	-				Poorly Graded Sand (SP)	to -					compressed	-
	40				coarse rounded gravel	10 _					sample	- 18
	146.9					_						
	_					_						- 🕅 🕅
	-					-						
	-		5.0	SN-5	No Recovery				0.0			- 🛛 🖓
	_				42.0-47.0'	_						
						_						
	_					-						99 -
	45					-						88 -
	141.9											$\otimes$ $\otimes$ $-$
						_						
	-	47.0				-						X X -
	-	47.0			Poorly Graded Sand (SP)				0.0		To increase	X X -
	_				47.0-52.0' - dark grav (5Y 4/1), moist, loose, mostly	-					recovery, driller	- 18
	_				fine-grained	_					switched to	
	_					_					auger bit for core	× × -
	50					-					Darrei	XX -
	136.9							1				
						_						
	-					_		1				- 🕅 🕅
	-		10.0	SN-6	Silty Sand (SM)		in:		0.0			- 12 12
	_				52.0-53.5' - dark gray (5Y 4/1), moist, loose, mostly	-						- 🛛 🖓
					fine-grained, fine to coarse rounded gravel			1				
	_				Poorly Graded Sand (SP)	_						- 🕅 🕅
	55 -				53.5-57.0' - dark gray (5Y 4/1), moist, loose, some fine to	-						- 🕅 🕅
	131.9				Coarse rounded graver							K K –
	-					_						
	_					_						K K -
	-	57.0			Woll Graded Sand (SW)		11 J.		0.0			- 🕅 🕅
	-				57 0-67 0' - very dark gravish brown (2.5Y 3/2) moist loose	-			<b>1</b>			X X -
	-				fine to coarse-grained sand with trace fine rounded gravel	-						
					- 0	_						
	60 -					-						- X X
$\vdash$	00						-	-	-	-		
L			1									



### BORING NUMBER: WI-CV-MW12-D

SHEET 3 OF 7

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : South End of Field (433269.9 N, 1204130.8 E)

ELEVATION: 186.9 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Tracking Rig, 8" Diameter Casing, 7" Core Barrel, 6" Casing, 4" Barrel

WATE	VATER LEVELS : DEPTH BELOW SURFACE (FT)			START : 1/24/17 14:05	END	: 1/26	6/17	15:45	5	LOGG	ER : N. Badon
DEPTH	EPTH BELOW SURFACE (FT)		FT)	SOIL DESCRIPTION		(D	R		38		
1	INTERV	AL (FT)				ŏ				1	
				SOIL NAME, USCS GROUP SYMBOL, COLOR,		P	Zoné	e e	e	COMMENTS	WELL DIAGRAM
		INECOVI		MOISTURE CONTENT, RELATIVE DENSITY OR		IBO	thing	dspac	e Hol		
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYN	Brea	Head	Abov		
126.9			#/ITFE						`		
					_						
	_				_						
	-	10.0	SN-7		-			0.0			99 - 19
	-				-						
					_						
	_				-						X X -
65	-				-						V V -
121.9					_						
	_				_						V V -
	67.0				-						88 -
				Poorly Graded Sand (SP)	_					Stop 1/24/17	
	_			67.0-77.0' - very dark grayish brown (2.5Y 3/2), moist, loose,	_					Start 1/25/17	XX -
	-			rounded gravel trace silt in lense	е					172'	V V -
	_				_					VOC = 0.1 ppm	
1160	_										
110.5	-				-						- 12
					_						
	_	10.0	SN-8		_			0.0			88 -
	-				-			0.0			9 9 -
					_						
	_				_						99 -
75	-				-						88 -
111.9	_										
	_				_						88.
	77 0				-						- 🕅 🕅
				Silty Sand (SM)	_					Headspace: 77-	
	_			77.0-80.0' - very dark grayish brown (2.5Y 3/2), moist, loose,	_					82'	- 🕅 🕅
	-			predominately line sand, trace line gravel	-					VOC = 0.1  ppm	K K -
1	]				_						
80	-			Poorly Croded Sand (SP)		Ш					$\boxtimes \boxtimes -$
100.9	-			80.0-85.5' - very dark gravish brown (2.5Y 3/2), moist loose	_						- 🕅
1				predominately fine sand, trace silt in lenses	_						
1	-	8.5	SN-9		-					Headenaaa, 92	- 🕅 🕅
1	-				-					85.5'	- 🛛 🖓
1	]				_					VOC = 0.1 ppm	
1	-				-						- 🕅 🕅
85	_				-						
101.9											
1	-			No Recovery	_						- 12 12
1	87.0			00.0-07.0	_						
1	_			Poorly Graded Sand (SP)	_		1			Headspace: 87-	
1	-			87.0-92.0' - very dark gray (2.5Y 3/1), moist, stiff, changing to	0 _					92'	- 🕅 🕅
1				- $        -$	-						
	_				_						Bentonite -
90											



WI-CV-MW12-D

SHEET 4 OF 7

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : South End of Field (433269.9 N, 1204130.8 E)

### ELEVATION: 186.9 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Tracking Rig, 8" Diameter Casing, 7" Core Barrel, 6" Casing, 4" Barrel

1	NATER	LEVELS	S :		START : 1/24/17 14:05	END	: 1/2	6/17	15:4	5	LOGG	ER : N. Badon
	DEPTH I	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION					~~		
							ö				1	
			(i i)				<u></u>	one			COMMENTS	WELL DIAGRAM
			RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		ğ	ing z	pace	Hole	CONNENTS	
				SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		Ĕ.	eath	eads	ove		
T				#/TYPE			Ś	B	Í	Ab		
Т	96.9 _					_						Grout
	-					-						- 12 12
	-					-						K K -
	_		10.0	SN-10	Well Graded Sand with Gravel (SW)		· · ·	-			Headspace: 92-	
	-				92.0-95.0' - very dark gray (2.5Y 3/1), moist, loose, gravel is	-					97'	
	_				fine to coarse, rounded, trace clay lenses (stiff)	_					VOC = 0.1 ppm	
	-					_						XX -
	05 -					-						- 13 13
	91.9				Well Graded Gravel with Sand (SW)							
					95.0-97.0' - very dark gray (2.5Y 3/1), wet, loose, gravel is	-	·					× × -
	_				subrounded to well rounded, trace cobbles, little silt	_						
	_	97.0										
	-				Clayey Gravel with Sand (GC)		V//	1	0.0			- 🕅 🕅
	-				57.0-107.0 - dark gray (5Y 4/1), fine to coarse gravel and fine to course sand, rounded to well rounded gravel trace cobble	e _	V//		1			KA KA -
	-				moist to slightly moist at 106-107' medium stiff to loose from	' -		1	1			- 🕅 🕅
	-				sonic drilling, trace oxidation	-	<b>K/</b> •	1	1			KA KA -
	100				-		V///		1			
	86.9					_	K///		1			X X -
	-					_	/*/_					- 12 12
	_					-						- 12 12
	-		11.0	SN-11		-	///		0.0			- 🕅 🕅
	-					-						- 🛛 🖓
	_					_	///					
	_					_	V//	1				
	· ·					-						X X -
	105							1				$\otimes$ $\otimes$ -
	01.9					-						- 12 12
	-					-		2				- 🕅 🕅
	-	107.0				-						
	_				Silty Gravel (GM)	_	•	6	0.0		Sealed 8"	
	_				107.0-113.0' - very dark grayish brown (2.5Y 3/2), wet (from	_					diameter	- KA KA
	-				drilling fluid?), loose, fine to coarse, little fine to coarse sand,	_					isolation casing	X X -
	-				gravel is rounded to well rounded	-	11.				at 107 with	N N -
	110 -					-	<b>!</b>     [	J	1		102'	M M -
	76.9		3.0	SN-12					1			
		1				-	<b>[</b>  4		1			
	_					_	.  •		1			
	-					-			1			- 🕅 🕅
	-	112.0				-	<b>   </b>	1	1			KA KA -
	-	113.0			No Recovery		┞┢┥		1		Drilling with 6"	- 🕅 🕅
	-				113.0-117.0' - driller notes very hard drilling on rocks thread	to -			1		casing, 4" core	KA KA -
	-	1			mush with drilling mud and pulverized rock				1		barrel from 113'	
	115_		0.0	SN 12	<b>~</b> ·	_			1		Driller notes	
	71.9		0.0	511-15		_			1		some of sample	
	-					-			1		might be lost	- 12 12
	-	117.0				-			1		because he has	KA KA -
	-	117.0			Clayov Sand with Gravol (SC)		777		1		free the casing	- 🕅 🕅
	-				117 0-127 0' - very dark gray (5V3/1) moist to 123' then	-	V///		1		through the seal	KA KA -
	-				slightly moist to dry to 127', stiff to very stiff, fine to coarse sa	nd –	V///	1	1		from 102-113'	
	-	1			and fine to coarse rounded gravel, trace rounded cobbles		V///	1	1		(isolation casing)	
	_				-	_	V///		1			$\bowtie$
L	120						¥//2	1	1			$\bowtie$
									1			
1									1			



BORING NUMBER: WI-CV-MW12-D

SHEET 5 OF 7

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : South End of Field (433269.9 N, 1204130.8 E)

ELEVATION: 186.9 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Tracking Rig, 8" Diameter Casing, 7" Core Barrel, 6" Casing, 4" Barrel

WATER	LEVELS	:		START : 1/24/17 14:05	END	: 1/26	<u>5/17</u>	15:45	LOC	GER : N. Badon
DEPTH E	BELOW SU	JRFACE (	FT)	SOIL DESCRIPTION		υ	RI	PID		
	INTERVA	L (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		BOLIC LO	hing Zone	space	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYM	Breat	Head	Above	
66.9 _ - - - - -		10.0	SN-14						Stop 1/25/17 Start 1/26/17 Headspace: 117-122' VOC = 0.7 ppm CO = 11 ppm Headspace: 117-122'	
125 61.9									CO = 11 ppm	
	127.0			Clayey Sand with Gravel (SC) 127.0-138.0' - very dark gray (2.5Y 3/1), moist, very stiff, fine coarse sand, fine to coarse rounded to well rounded gravel, trace rounded cobbles, trace oxidation	e to				Headspace: 127-132' CO = 5.0 ppm	
130 56.9 - - - -									Headspace: 132-137' CO = 13 ppm	
135_ 51.9_ - - -		15.0	SN-15	015	-			0.0		
140 46.9				138.0-141.0' - dark grayish brown (2.5Y 4/2), moist, very stiff ~10% fine sand, <5% fine rounded gravel	F,					
	142.0			Clay (CL) 141.0-142.0' - very dark gray (5Y 3/1), dry, very stiff, brittle, little fine sand Clayey Sand (SC) 142.0-142.5 - very dark grayish brown (2.5Y 3/2), moist, dense, fine to coarse-grained	- 			0.0		
145_ 41.9_ - - -				Well Graded Sand (SW) 142.5-150.0' - very dark gray (10YR 3/1), wet, loose, fine to coarse, trace fine rounded gravel, trace silt	-			0.0		
-					-					
150		15.0	SN-16		_					



WI-CV-MW12-D SHEET

SHEET 6 OF 7

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : South End of Field (433269.9 N, 1204130.8 E)

ELEVATION: 186.9 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Tracking Rig, 8" Diameter Casing, 7" Core Barrel, 6" Casing, 4" Barrel

WAIEF	<u>R LEVELS</u>	5:		START : 1/24/17 14:05	END	: 1/2	6/17	15:45	5	LOGG	ER : N. Badon
DEPTH	EPTH BELOW SURFACE (FT)			SOIL DESCRIPTION		C)	R	PID EADIN	GS		
	INTERV	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,			one Zone	ace	lole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY	•	SYMB	Breathir	Headsp	Above H		
36.9				Poorly Graded Sand (SP) 150.0-155.0' - very dark gray (10YR 3/1), wet, loose, predominately fine to medium, trace fine gravel				0.0			
31.9 -	157.0			Well Graded Sand (SW) 155.0-157.0' - very dark gray (2.5Y 3/1), wet, loose, fine to coarse with trace fine subrounded gravel				0.0			
- - - - - - - - - - - - - - - - - - -	-			Poorly Graded Sand with some Well Graded Lenses(SF 157.0-158.6' - dark gray (2.5Y 4/1), wet, loose, predominate fine to medium-grained trace fine gravel, trace silt lenses, so oxidation at 165' and 158' Clay (CL) 158.6-159.6' - dark grayish brown (2.5Y 4/2), moist, very sti trace sand Poorly Graded Sand with some Well Graded Lenses(SF 159.6-166.0' - dark gray (2.5Y 4/1) wet loose predominate	() - 			0.0			
165 21.9		10.2	SN 17	Clay (CL) 166.0-167.0' - dark gray (2.5Y 4/1), moist, very stiff, some	"y			0.0			
170 16.9 - -		19.5	514-17	oxidized mottling <b>Poorly Graded Sand (SP)</b> 167.0-177.0' - dark gray (N 4/0), wet, loose, fine and very fine-grained, trace silt lense				0.0			
175 11.9 - - -	177.0			Poorly Graded Sand (SP) 177.0-177.4' - dark gray (N 4/0), wet, loose, fine to medium-grained Clav (Cl.)	- - - - - - - - - - - - - - - - - - -			0.0			
180				177.4-183.0' - dark gray (5Y 4/1), moist, very stiff, trace woo at 182.9-183.0'	d _						



### BORING NUMBER: WI-CV-MW12-D

SHEET 7 OF 7

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : South End of Field (433269.9 N, 1204130.8 E)

### ELEVATION: 186.9 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Tracking Rig, 8" Diameter Casing, 7" Core Barrel, 6" Casing, 4" Barrel

	WATER	LEVELS	3 :		START : 1/24/17 14:05	END	: 1/2	6/17	15:45	5	LOGG	ER : N. Badon
	DEPTH E	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		0	R	PID EADIN	GS		
		INTERVA	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		OLIC LO	ng Zone	Dace	lole	COMMENTS	WELL DIAGRAM
				SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above F		
-	6.8 _			#/111 L		-						Bentonite Chips
	- - - 185 - 1.8 - -		21.0	SN-18	Poorly Graded Sand (SP) 183.0-190.5' - dark gray (N 4/0), wet, loose, predominately ve fine to fine, trace silt lenses	- ery _ - - - - -			0.0		Headspace:	
	- 190_ -3.2 _ - -				<b>Silt (ML)</b> 190.5-193.8' - dark gray (5Y 4/1), wet, dense/very stiff, low plasticity			•			187-192' CO = 4 ppm Headspace: 192-197'	2" Schedule - 80 - 0.010 Slot Screen
	- 195_ -8.2 _ - -	197.0			Organic Silt (OL) 193.8-197.0' - very dark gray (5Y 3/1) to black (5Y 2.5/1), we hard, low plasticity, abundant grass and wood	- - - t, - - - - -					CO = 2 ppm	
	_				Bottom of Boring at 198.0 ft bgs on 1/26/17 15:45						Stop 1/26/17 Bottom of borehole = 198' (measured depth)	
								1				



BORING NUMBER: WI-CV-MW12-S

SHEET 1 OF 4

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : South End of Pinfield (433273.8 N, 1204137.4 E)

ELEVATION: 187.0 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Track Rig, 6" Casing, 4" Core Barrel

WATER LEVELS : ---START : 1/29/17 14:05 END : 1/31/17 15:00 LOGGER : E. Bilyeu DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 187.0 Cleared 5' with vac truck, no description 0.0-5.0' 5 5.0 182.0 No Recovery For two runs, 5.0-15.0' driller reports hand obstruction fell on bit. Drill bit advances, but no recovery. Possibly large gravel/cobble. Top of SN-3 is moist. No water 10 0.0 SN-1 was used during drilling until 105' 177.0 bgs. 15 15.0 172.0 No Recovery 15 0-25 0' 20 0.0 SN-2 167.0 25 25.0 162.0 0.0 Well Graded Sand (SW) 25.0-28.0' - very dark gray (2.5Y 3/1), moist, loose, 95% fine to coarse subrounded sand, 5% small round to subrounded gravel 0.0 Poorly Graded Sand (SP) 28.0-29.0' - very dark gray (2.5Y 3/1), moist, loose, 95% medium sand, 5% subrounded gravel 30



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SHEET 2 OF 4

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : South End of Pinfield (433273.8 N, 1204137.4 E)

ELEVATION: 187.0 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Track Rig, 6" Casing, 4" Core Barrel

1	VATER	LEVELS	3 :		START : 1/29/17 14:05	END	1/3	1/17	15:00	)	LOGG	ER : E. Bilyeu
Γ	DEPTH E	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		ß	R	PID EADIN	SS		
		INTERVA	AL (FT)	-RY (ET)	SOIL NAME, USCS GROUP SYMBOL, COLOR,		ILC LO	Zone	8	e	COMMENTS	WELL DIAGRAM
			NEOOVE	SAMPLE #/TYPF	MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMBO	Breathing	Headspa	Above Ho		
Ī	157.0_ - - - - -		7.0	SN-3	Well Graded Sand (SW) 29.0-32.0' - very dark gray (2.5Y 3/1), moist, loose, 95% fine to coarse subrounded sand, 5% small round to subrounded gravel No Recovery 32.0-35.0'	0			0.0			
	35 152.0_ _	35.0			<b>No Recovery</b> 35.0-37.0'							
					Well Graded Sand (SW) 37.0-40.0' - very dark gray (2.5Y 3/1), dry, loose, 95% subangular fine sand, 5% small to medium subrounded to subangular gravel				0.0			
	40 147.0_ - - - -		6.5	SN-4	Poorly Graded Sand with Gravel (SP) 40.0-43.5' - very dark gray (2.5Y 3/1), dry, loose, 85% fine to medium subangular sand, 15% small to medium subangular t subrounded gravel	0			0.0			
	45 142.0	45.0			No Recovery 43.5-45.0' Poorly Graded Sand with Gravel (SP)	-						
	-				<ul> <li>45.0-46.0' - very dark gray (2.5Y 3/1), dry, loose, 85% fine to medium subangular sand, 15% small to medium subangular t subrounded gravel</li> <li>Silty Sand with Gravel (SM)</li> <li>46.0-49.0' - dark gray (5Y 4/1), loose, 70% fine subangular sand, 15% low plasticity fines, 15% fine to medium gravel</li> </ul>	o/			0.0			
	50_ 137.0_ - -		8.3	SN-5	Poorly Graded Sand (SP) 49.0-53.5' - dark gray (5Y 4/1), loose, 95% fine to medium subangular sand, 5% fine gravel, trace fines							
	55	55.0			No Recovery 53.5-55.0'				0.0			
	132.0_ - - - - - -				No Recovery 55.0-61.5'							
$\left  \right $	60											
1								I	I 1	1		



BORING NUMBER: WI-CV-MW12-S

SHEET 3 OF 4

## SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : South End of Pinfield (433273.8 N, 1204137.4 E)

#### ELEVATION: 187.0 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Track Rig, 6" Casing, 4" Core Barrel

WATEF	WATER LEVELS : DEPTH BELOW SURFACE (FT)			START : 1/29/17 14:05	END	1/31	1/17	15:00	)	LOGG	ER : E. Bilyeu
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		G	R	PID EADIN	GS		
	INTERV	AL (FT)				С С С	he				
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		SOLIC	ing Zo	pace	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above I		
127.0		3.5	SN-6		_						
-	-				-						- 🛛 🖓
-	-			Poorly Graded Sand (SP) 61.5-65.0' - very dark gray (2.5Y 3/1), loose, 95% fine to medium subangular sand, 5% fine medium gravel	-			0.0			
65	65.0										
122.0				Poorly Graded Sand (SP) 65.0-73.0' - very dark gray (2.5Y 3/1), loose, 95% fine to medium subangular sand, 5% fine medium gravel							
-	-							0.0			
70 117.0	-	10.0	SN-7		-						
-	-				-						
-				Poorly Graded Sand (SP) 73.0-75.0' - very dark gray (2.5Y 3/1), loose, >90% fine	-			0.0			
75_	75.0			subangular sand, <10% nonplastic fines, trace gravel	-						
112.0 - -	-			No Recovery 75.0-77.5'	-						
-				Poorly Graded Sand (SP) 77.5-79.01 - very dark gravish brown (2.5Y 3/2), loose, 95% fi	 ne			0.0			
80_ ⁻ 107_0	-	7.5	SN-8	Subangular sand, 5% line graver and honplastic lines Silty Sand (SM) 79.0-83.5' - very dark grayish brown (2.5Y 3/2), loose, 80% fi subangular sand, 20% populatio fines	ne						
-	-				-						
-	-			P. 1. 0. 1. 10. 1/(P)	-						
85_ 102.0	85.0			Poorly Graded Sand (SP) 83.5-85.0' - very dark grayish brown (2.5Y 3/2), loose, 100% fine to medium sand				0.0			
				85.0-87.5' - very dark grayish brown (2.5Y 3/2), loose, 95% fi sand, 5% gravel	ne _ _ _						
90	-			Poorly Graded Sand (SP) 87.5-90.0'- very dark gray (2.5Y 3/1), loose, 90% fine to medium sand, subangular, <10% nonplastic fines, grades downward to sandy clay				0.0			<ul> <li>← Bentonite –</li> <li>Chips –</li> <li>–</li> <li>–</li> </ul>



WI-CV-MW12-S

SHEET 4 OF 4

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : South End of Pinfield (433273.8 N, 1204137.4 E)

#### ELEVATION: 187.0 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Track Rig, 6" Casing, 4" Core Barrel

DEPTH BELOW SURFACE (FT)       SOIL DESCRIPTION       PD READINST         INTERVAL (FT)       SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY       90 90 90 90 90 90 90 90 90 90 90 90 90 9		
INTERVAL (FT)     SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY     00 00 00 00 00 00 00 00 00 00 00 00 00		
97.0       10.0       SN-9       Clayey Sand (SC) 90.0-94.0' - moist, medium stiff, 65% fine sand, 35% low plasticity fines, low dilatancy, medium to high dry strength       0.0         95       95.0       94.0-95.0' - very dark grayish brown (2.5Y 3/2), moist, loose, 65% fine to coarse gravel, subangular, 35% fine to medium subangular       0.0         96       95.0       95.0 - very dark grayish brown (2.5Y 3/2), moist, loose, 65% fine to coarse gravel, subangular, 35% fine to medium subangular       0.0         100       SN-10       SN-10       SN-10		WELL DIAGRAM
97.0       10.0       SN-9       Clayey Sand (SC) 90.0-94.0' - moist, medium stiff, 65% fine sand, 35% low plasticity fines, low dilatancy, medium to high dry strength       0.0         95       95.0       95.0       Well Graded Gravel with Sand (GW) 94.0-95.0' - very dark grayish brown (2.5Y 3/2), moist, loose, 65% fine to coarse gravel, subangular, 35% fine to medium subangular       0.0         Well Graded Gravel with Sand (GW) 95.0-97.0' - very dark grayish brown (2.5Y 3/2), moist, loose, 65% fine to coarse gravel, subangular, 35% fine to medium subangular       0.0         10.0       SN-10       SN-10       0.0	COMMENTS	
97.0       10.0       SN-9       Clayey Sand (SC) 90.0-94.0' - moist, medium stiff, 65% fine sand, 35% low plasticity fines, low dilatancy, medium to high dry strength         95       95.0         92.0       94.0-95.0' - very dark grayish brown (2.5Y 3/2), moist, loose, 65% fine to coarse gravel, subangular, 35% fine to medium subangular         Well Graded Gravel with Sand (GW) 95.0-97.0' - very dark grayish brown (2.5Y 3/2), moist, loose, 65% fine to coarse gravel, subangular, 35% fine to medium subangular         Well Graded Gravel with Sand (GW) 95.0-97.0' - very dark grayish brown (2.5Y 3/2), moist, loose, 65% fine to coarse gravel, subangular, 35% fine to coarse subangular         100       10.0       SN-10         100       SN-10		
95       95.0       94.0-95.0' - very dark gravish brown (2.5Y 3/2), moist, loose, 65% fine to coarse gravel, subangular, 35% fine to medium subangular         92.0       92.0       95.0-97.0' - very dark gravish brown (2.5Y 3/2), moist, loose, 65% fine to coarse gravel, subangular, 35% fine to medium subangular         91.0       95.0-97.0' - very dark gravish brown (2.5Y 3/2), moist, loose, 65% fine to coarse gravel, subangular, 35% fine to medium subangular         100       97.0-105.0' - dark grav (5Y 4/1), wet, loose, 55% fine to coarse subangular gravel, 15% fine subangular sand, 30% low plasticity fines, low dilatancy, medium to high dry strength		← 20/40 Sand
92.0 92.0 10.0 SN-10 92.0 10.0 SN-10 92.0 10.0 SN-10 95.0-97.0' - very dark grayish brown (2.5Y 3/2), moist, loose, 65% fine to coarse gravel, subangular, 35% fine to medium subangular Clayey Gravel with Sand (GW) 97.0-105.0' - dark gray (5Y 4/1), wet, loose, 55% fine to coarse subangular gravel, 15% fine subangular sand, 30% low plasticity fines, low dilatancy, medium to high dry strength		2월21 _
		2" Schedule 80 - 0.010 Slot Screen
105 105.0	Used water to	
105.0-106.5' - very dark grayish brown (2.5Y 3/2), wet, medium density, 55% low plasticity fines, 10% fine subangular sand, 35% fine subangular gravel, no dry strength       0.0         Gravelly Lean Clay (CL)       106.5-111.0' - wet, very dark grayish brown (2.5Y 3/2), 55% low to medium plasticity fines, 10% coarse subangular sand, 35% fine subangular gravel, medium dry strength       0.0         110       10.0       SN-11       10.0	keep casing clear. Hard rocks felt by driller at end of run.	
Silty Gravel (GM) with Sand 111.0-115.0' - very dark gray (2.5Y 3/1, moist, loose, 60% fine subangular gravel, 20% fine subangular sand, 20% nonplastic fines		
72.0 Bottom of Boring at 115.0 ft bgs on 1/31/17 15:00		



WI-CV-MW13-M SHEET 1 OF 7

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : NE of Bldg 2807 (437627.1 N, 1200713.2 E)

ELEVATION: 189.1 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Track Rig, 8" diameter casing, 7" diameter core barrel, 4" barrel, 6" casing

WATER	LEVELS	:		START : 12/21/16 14:53	END	; 1/5	<u>17 1</u>	5:15		LOGO	ER : N. Badon
DEPTH E	BELOW S	URFACE (	FT)	SOIL DESCRIPTION				PID	20		
						8	R		38		
	INTERVA	AL (FI)				5	one				
		RECOVE	ERY (FT)	SUIL NAME, USCS GROUP SYMBOL, COLOR,		5	jg Z	ace	ole	COMMENTS	
				CONSISTENCY, SOIL STRUCTURE, MINERALOGY		MB	athir	dspe	le L		
			SAMPLE #/TYPE			Σ	Bre	Hei	Abo		
189.1			<i>"</i> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Cleared with vac truck and air knife no description							
				0.0-5.0'	-						
					_						
_					_						N N -
_					-	-					- 12
-					-	-					- 🕅 🕅
_					-	-					- 🕅 🕅
_					-						K K -
5	5.0				-	-					
184.1_				Well Graded Sand (SW)						Headspace: 5-	
_		30	SN-1	5.0-7.0' - dark yellowish brown (10YR 3/4), moist, medium	_					7': VOC = 0.1	N N -
_		0.0	on i	dense, fine to coarse, some fine to coarse gravel, rounded,	-	-				Soil Screening:	- 12 12
-	7.0			some slit		-				VOC = 0.0	- 🕅 🕅
-				Well Graded Sand (SW)	-	-				Headspace ⁻	- 12 12
_				medium dense, fine to coarse, little fine to coarse rounded	-					7-12': VOC =	- 12
_				gravel, trace silt	-					0.1	
				Well Graded Gravel (GW) with Sand						12-14': VOC =	
10				9.0-10.7' - very dark grayish brown (2.5Y 5/2), moist, mediur	n _					0.2	$\otimes \otimes $ –
179.1				dense, fine to coarse rounded to subrounded, sand is fine to	-	-				Soli Screening: $VOC = 0.0$	X X -
_				coarse, trace silt	_/-	-::				$BZ^{-}VOC = 0.0$	- 12
-				Well Graded Sand with Gravel (SW)	-	••					- 12
_		7.3	SN-2	10.7-12.6' - Very dark grayish brown (2.5Y 5/2), moist, mediu	m - d	1::	1				- 🕅 🕅
				Silty Gravel (GW)	<u>u</u>	••					
_				12 6-14 3' - dark grav (5Y 4/1) dry medium dense, fine to	_	::	1				K K -
_				coarse rounded to well rounded, some fine to coarse sand	-	-1::	1				- 12 12
15				No Recovery	-	<b> ``</b>	1				K K -
174 1				14.3-17.0'	_						
					-						- 12
					_						
	17.0										
_				Well Graded Gravel with Sand (GW)	-	- ::	1			Stop 12/21/16	- 🕅 🕅
-				17.0-25.25' - Very dark grayish brown (2.5Y 3/2), moist to dry	, _	-1::	1			Start 1/3/17	- 🕅 🕅
-				fine to coarse gravel rounded to well rounded	iu _	-				Headsnace [.]	Ka Ka -
_				into to obdico gravol, roundoù to von roundoù	-	1::	1			17-22' = 0.0  ppm	- 12
20					_	1::	1			22-25.25' = 0.0	
169.1					_					ppm	
_					-	- ::	1			Soil screen along	- 12 12
-					-	1::	1			core 0.0 ppm	- 🕅 🕅
_		8.3	SN-3		-						- 12
-					-	1::	1				- 🕅 🕅
					-	1::	1				
_					-						KA KA –
or -					-	- ::	1				- 12 12
25 164 1						1::	1				
104.1				No Recovery	-	-					N N -
_				25.25-27.0'	-	-					
	27.0										
				Well Graded Gravel with Silt and Sand (GW-GM)	_		1			Headspace:	
-				27.0-31.0' - very dark gray (2.5Y 3/1), slightly moist to dry,	-		1			27-29': = 0.0	- 🕅 🕅
-				cobbles	-		1			ppm 29-31' = 0.0 ppm	- 🕅 🕅
-		6.6	SN-4		-	1:1	1			Soil Screen = $0.0$	KA KA -
30					-	1.	1			ppm	- 12 12
							1				
						1					



WI-CV-MW13-M SHEET 2 OF 7

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : NE of Bldg 2807 (437627.1 N, 1200713.2 E)

ELEVATION: 189.1 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Track Rig, 8" diameter casing, 7" diameter core barrel, 4" barrel, 6" casing

WATER	<u>R LEVELS</u>	5:		START : 12/21/16 14:53	END	: 1/5	17 1	<u>5:15</u>		LOGG	ER : N. Badon
DEPTH			(FT)	SOIL DESCRIPTION				PID	~~		
		AL (ET)	. ,			8	R	EADIN	GS		
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		30LIC L	ing Zone	pace	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYME	Breath	Heads	Above		
159.1	21.0				-						- 🕅 🕅
		7.0	SN-5	<ul> <li>Well Graded Gravel with Silt and Sand (GW-GM)</li> <li>31.0-33.0' - very dark gray (2.5Y 3/1), slightly moist to dry, medium dense, gravel is rounded to well rounded, trace cobbles</li> <li>Poorly Graded Sand (SP)</li> <li>33.0-37.0' - very dark grayish brown (2.5Y 3/2), moist, mediu dense, sand is fine to medium-grained, trace silt</li> </ul>	- - - - - - - -					Headspace: 31-34': = 0.0 ppm 34-37' = 0.0 ppm Soil Screen = 0.0 ppm	
I -	37.0										X X -
40	-	4.3	SN-6	<b>Poorly Graded Sand (SP)</b> 37.0-41.0' - very dark gray (2.5Y 3/1), very moist/wet, mediun dense, fine to medium with trace fine gravel	n _ _ _ _		•			Sample is wet, sits above Silty Sand at bottom of sample interval	
149.1	410				-					0 0 nnm	X X -
45_ 144.1 50_ 139.1 139.1	57.0	18.5	SN-7	Silty Sand (SM)         41.0-41.3' - very dark gray (2.5Y 3/1), moist, medium dense, fine to medium         Poorly Graded Sand (SP)         41.3-57.0' - very dark grayish brown (2.5Y 3/2), very moist to wet, medium dense, fine to medium-grained, trace fine to coarse gravel and cobbles, subrounded         Poorly Graded Sand (SP)         57.0-65.7' - very dark grayish brown (2.5Y 3/2), very moist (w near top of sample, drilling fluid?), medium dense, fine to medium-grained, trace fine to medium-grained, trace fine to coarse gravel and cobbles, subrounded						0.0 ppm Screening = 0.0 ppm Started advancing casing wit drilling mud at 37.0' bgs Headspace: 41-46': 0.0 ppm 51-57': 0.0 ppm Breathing zone = 0.0 ppm	
60	-				-			1			- X X



WI-CV-MW13-M SHEET 3 OF 7

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : NE of Bldg 2807 (437627.1 N, 1200713.2 E)

ELEVATION: 189.1 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Track Rig, 8" diameter casing, 7" diameter core barrel, 4" barrel, 6" casing

WATER LEVELS : DEPTH BELOW SURFACE (FT)			START : 12/21/16 14:53	END	1/5/	<u>17 1</u> :	5:15		LOGG	ER : N. Badon	
DEPTH E	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		(1)	R		35		
	INTERVA	AL (FT)		SOIL NAME, USCS GROUP SYMBOL, COLOR.			Zone	g		COMMENTS	WELL DIAGRAM
		RECOVE	SAMPLE	MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMBOI	Breathing	Headspac	Above Hol		
129.1			#/111 L					-			
		8.7	SN-8		-						
65					_						
124.1_				No Recovery 65.7-67.0'							
	67.0			Poorly Graded Sand (SP) 67.0-69.3' - very dark grayish brown (2.5Y 3/2), very moist (v from drilling fluid), medium dense, fine to medium-grained, trace coarse grains	vet _ 						
70 119.1				<b>Poorly Graded Sand with Silt (SP-SM)</b> 69.3-77.0' - dark grayish brown (2.5Y 4/2), slightly moist, medium dense, very fine to fine-grained							
-		9.0	SN-9		-						
 75 114.1											
-	77.0			<b>Poorly Graded Sand with Silt Lenses (SP-SM)</b> 77.0-84.3' - dark grayish brown (2.5Y 4/2), slightly moist,						Headspace: 77-80': 0.0 ppm	
- 80 109.1				medium dense, very inte to inte-grained	-					ppm	
-		7.3	SN-10		-						
				No Recovery	-						- Bentonite - Grout -
 104.1_ -				84.3-87.0'							
-	87.0			Poorly Graded Sand (SP)							
-				dense, trace silt, sand is very fine to fine-grained	-						
90											



WI-CV-MW13-M SHEET 4 OF 7

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : NE of Bldg 2807 (437627.1 N, 1200713.2 E)

ELEVATION: 189.1 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Track Rig, 8" diameter casing, 7" diameter core barrel, 4" barrel, 6" casing

WATER	<u> LEVELS</u>	5:		START : 12/21/16 14:53	END	: 1/5/	17 1	5:15		LOGG	ER : N. Badon
DEPTH	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		(1)	R		66		
1						ŏ	$\vdash$			4	
1						<u></u>	_one			COMMENTS	WELL DIAGRAM
		RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		ц Ц	z ɓu	pace	우		
			SAMDI E	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		μ	eathi	ads	ove I		
			#/TYPE			Ś	ä	Ξ	Ab		
99.1					_					Stop 1/3/17	
					_					Start 1/4/17	
-	-				-					Core drilled on	KA KA -
-	-	10.3	SN-11		-		·			1/3/17, retrieved	N N -
-	-			0:14 (MIL)	-						X X -
-	-			SIII (IVIL) 92 6-93 5' - dark gravish brown (2 5V 4/2) moist dense Jow	, –					Headspace:	× × ·
										87-92': 0.0 ppm	
	_			Silty Very Fine Sand (SM)						92-97': 0.0 ppm	
95	-			93.5-97.0' - dark grayish brown (2.5Y 4/2), moist, medium							
94.1	-			dense	-						- 🕅 🕅
-	-				-						- 🕅 🕅
-	97.0				-						
				Sandy Silt (ML)						Headspace:	
				97.0-101.7' - dark grayish brown (2.5Y 4/2), moist, dense,	_					97-100' = 0.0	
-	-			cohesive, very fine sand throughout, trace organics/roots	_					ppm	× × -
-	-				-					$100-103^{\circ} = 0.0$	- 12
100	-				-					$103-106\ 2'=0\ 0$	- 🕅 🕅
89.1	1									ppm	
					_					ľ.	
	_				_						. 12 1
-	-	9.2	SN-12	Poorly Graded Sand (SP)	-						K K -
-	-			101.7-102.9' - dark grayish brown (2.5Y 4/2), moist, medium	ı –						- 12 12
-	1			dense, very fine-grained, little silt							
				Sandy Silt (ML)	_						
-	_			cohesive very fine sand throughout trace organics/roots	_						X X -
105	-										$\otimes$ $\otimes$ $-$
84.1	-				-						XX -
-	-				-						- 🕅 🕅
	107.0			NO Recovery	_						
				Sandy Silt (MI)							
-	-			107.0-110.4' - dark gravish brown (2.5Y 4/2), very moist.	-						- 🕅 🕅
-	-			dense, cohesive, very fine sand throughout	-						K K -
-	-				-						- 12 12
110					_						
79.1	4			Silt (ML)			1				N N -
I -	-			JIIL (IVIL) 110 4-113 0' - gravish brown (2 5V 5/2), slightly moist	-						X X -
1 -	-			dense/hard, some very fine sand lenses from 110.8-111.0' b	as -						× × ·
1 -	1	10.0	SN-13	· · · · · · · · · · · · · · · · · · ·	-						
1	1										
1 -	4			Silt with Gravel (ML)	_	ØD,					
-	4			113.0-114.4' - dark gray (2.5Y 4/1), slightly moist, dense	-	K//	4				- 🕅 🕅
115	1			(IILL), Some samu, now prasticity, graver is time to coarse	=	<b>r</b> ///	1	I	1		- 12 1
74.1	1			JIILY JANG WITH GRAVEL (JW) 114 4-117 0' - dark grav (2.5V 4/1) mojet medium dense							KA KA –
1	1			(less cohesive than 113.0-114.4'). gravel is fine to coarse.	-		1				
1	]			rounded to well rounded, predominately fine sand	_						
- I	117.0										N N -
· -	-			Silty/Clayey Fine to Medium Sand with Gravel (SM/SC)	-	V///	1				X X -
-	1			120.0-121.0' medium dense cohesive fine to coarse angul	lar –	V///	1				
1 -	1			to well rounded	_	V///					
1	]	40	SN 14		_	V///					
120		4.0	011-14			[///	1				$\bowtie$
1											
									ļ		



WI-CV-MW13-M SHEET 5 OF 7

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : NE of Bldg 2807 (437627.1 N, 1200713.2 E)

ELEVATION: 189.1 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Track Rig, 8" diameter casing, 7" diameter core barrel, 4" barrel, 6" casing

WATE	ER LEVELS	S:		START : 12/21/16 14:53	END	<u>: 1/5/</u>	17 15	5:15		LOGG	ER : N. Badon
DEPT	H BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		0	RF		38		
1	INTERV	AL (FT)				ĬŎ				4	
1				SOIL NAME, USCS GROUP SYMBOL, COLOR.		9	Zone	ø	a	COMMENTS	WELL DIAGRAM
		RECOVI	ERY (FI)	MOISTURE CONTENT, RELATIVE DENSITY OR		BOI	hing	spac	문		
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		Σ	reat	lead	bove		
			#/TYPE			0 ////	-	-	∢		
09.	'-				-					temporary casing	- 12 12
	1				-					set at 117.0' bgs	
	122.0									117.0' bgs and	
	-			Silty/Clayey Fine to Medium Sand (SM/SC)	-	///				below drilled with	22
	-			fine to medium sand with fine to coarse rounded/subrounded	- I					barrel and 6"	- 18
	1			gravel, trace cobbles	_					diameter outer	
105	. –				_					casing	- 18
64 1										Headspace	
0					-					117-119': VOC	
					_					= 0.0 ppm	
	-				_					119-121:CO = 0	- 🕅 🕅
	-				-					ppm	- 12
	1				_	V//				Stop 1/4/17	
	_				_	V//				Start 1/5/17	
130	_	19.5	SN-15		_					Headspace	- 🕅 🕅
59.1										122-127': CO =	
	]				_					20 ppm	
	_				-					$H_2S = 0.8 \text{ ppm}$ 127-132'' CO =	- 🕅 🕅
	-				_					6 ppm	K K -
	-				-					132-138': CO =	- 🕅 🕅
	1				_					12 ppm Breathing zone -	
	-				_					0 ppm	9 9 -
135	-				-					- FF	
54.											
					_						
	127.0				-						- 12 12
	137.0			$\setminus$ 137' - extra recovery - Poorly Graded Sand (SP), very	[	×///				Headspace:	
	]			moist/wet, loose, trace fine gravel, sand fine to medium, trace	e /_					137-142': CO =	
	-			Silt Bearly Creded Send (SB)						8 ppm	XX -
	-			137 0-155 3' - dark grav 2 5Y 4/1) very moist/wet	-					142-147 : CO =	N N -
140	-			predominately fine-grained, trace silt	_					147-152': CO =	
49.1					_					21 ppm	
	-				-					152-155.5': CO	X X -
	-				-					Breathing Zone	- 12 13
	1				_					= 0.0 ppm, all	
	4				_					parameters, O _z	
	-				-					- 20.0	XX -
	1				-						- 🕅 🖓
145											
44.1	-				_						×× -
	-				-						- 12 12
1	1	10 5	ON 40		-						×× -
1	1	10.5	01-10		_						
1	-				_						- 121
	-				-						- 🕅 🖓
1	1				-						- 12
150					_						



WI-CV-MW13-M SHEET 6 OF 7

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : NE of Bldg 2807 (437627.1 N, 1200713.2 E)

ELEVATION: 189.1 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Track Rig, 8" diameter casing, 7" diameter core barrel, 4" barrel, 6" casing

WA	<b>\TER</b>	LEVELS	S:		START : 12/21/16 14:53	END	: 1/5	17 1	5:15		LOGO	ER : N. Badon
DE	PTH B	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION				PID	~~		
							Ö			33	1	
							Ц Ц	one			COMMENTS	WELL DIAGRAM
			RECOVE	ERY (FT)	MOISTURE CONTENT RELATIVE DENSITY OR		G	z ɓu	Dace	ble	CONNINENTS	
					CONSISTENCY, SOIL STRUCTURE, MINERALOGY		MB	sathi	ads	ove F		
				#/TYPE			S	Bre	Ξ	Abc		
3	9.1					_						
	_					_						
	_					-						KI KI -
	_					-						N N -
	-					-						X X -
	-					-						- 🕅 🕅
	_					_		·				
	_					_						
1	55					_						
1 S	4.1				√ Silty Sand (SM)	Г	'F I'I	-				- 🕅 🕅
	-				155.3-155.5' - dark gray (2.5Y 4/1), wet, medium dense, very	/-						- 🕅 🕅
	_	157.0			\fine-grained							
	_				NO Recovery	/_					Headspace:	
	-				Poorly Graded Sand (SP)	_/ _		1			157-162': CO =	KA KA -
	-				157.0-175.3' - dark gray (2.5Y 4/1) changing to very dark gray	v –					162-167'· 0.0	98 -
	-	1			(2.5Y 3/1) at 170.6-175.3', very moist to wet, loose,	· -					ppm	KA KA -
1	60				predominately fine, trace silt	_					167-172': 5 ppm	
2	9.1					-					(CO)	XX -
	-					-					= 5 nnm	- 🕅 🕅
	-					-					- 5 ppm	- 12
	-					-						
	_	]				_						
	_					-						K K -
	-					-						- 🕅 🕅
1	65					-						KA KA -
2	4.1						1					
	_					_						
	-					-						N N -
	-		18.3	SN-17		-						24 ¥4 -
	-					-						- Dentenite
	_					_	<b> </b> .					- Bentonite - Chips -
	_					_						
1	70 -					-		·				는 돈 -
1	9.1	1				_	1	1		1		이 [2] -
1						-		1				20/40 Sand
	_					_						
	_					-		1				E E -
	-					-						i. ⊨i
	_					-						
	_					_						
						-						
	/5 ⊿ 1						L					
1'	- <b>r</b> .   _				No Recovery	-						: 日:   · · · · · · · · · · · · · · · · · ·
	-				175.3-177.0'	-						
	_	177.0					<b>_</b>					
	_				Poorly Graded Sand (SP)	_						2"
	-				1//.0-181.5' - dark gray (GLEY1 N4/0), very moist/wet, loose	, _		l.				Schedule -
	_				predominately inte-granted	-						
	_					-						Slot Screen
1	80											
							L					



WI-CV-MW13-M SHEET 7 OF 7

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : NE of Bldg 2807 (437627.1 N, 1200713.2 E)

ELEVATION: 189.1 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C Full Size Track Rig, 8" diameter casing, 7" diameter core barrel, 4" barrel, 6" casing

	WATER	LEVELS	S:		START : 12/21/16 14:53	END	: 1/5/	/17 1	<u>5:15</u>		LOGG	ER : N. Badon
I	DEPTH I	BELOW S	URFACE (	FT)	SOIL DESCRIPTION					~~		
							Ö	Ľ		33	1	
			чг (г I)				U U	one	1	I		
			RECOVE	ERY (FT)	SUIL NAME, USUS GROUP SYMBOL, COLOR,		5	ig Z	ace	ole	COMMENTS	
					CONSISTENCY SOIL STRUCTURE MINERALOGY	4	Ϊġ	athin	dsbi	θĤ		
				SAMPLE	CONSISTENCE, SOIL STRUCTURE, MINERALUGI	•	34	Brea	Hea	Abov		
ł	0.1			#/IYPE				-		[`]	Hoodonooo	· 🗖 · I
	5.1					-						
	-					-					9 nnm	
	-				Silty/Clayey Fine to Medium Sand (SM/SC)		VII.				182-187' CO =	
	-				181 5-183 3' - dark grav (N 4/0) moist dense	-	///	5			4 ppm	
	-					-	V///	1			187-192': = 0.0	전문감
	-					_					ppm	
	-				Silt/Clay (ML/CL)	_					192-197': 0.0	
					183.3-197.0 - dark gray (5Y 4/1), moist, stiff to very stiff,	_		1			ppm	
	185				conesive	_					Breathing Zone	
	4.1					_		1			= 0.0	
	_					_						
	_					_	1112	1	1	I I		1919-191
	-		22.0	SN-18		_			1	I I		[33] -
	-					-	111/	1	1	I		
	-					-	111/	1	1	I		-
	-					-	110	1	1	I		-
	-					-	111	1	1	I		-
	100					-			1	I I		-
	-0.9											_
	0.0 _					-						
	-					-						-
	-					-		1				
	-					-						
						_		1				
						_						
	_					_						
	_					_		1				
	195											
	-5.9					_		1				
	-					-						
	-	407.0				-		1				
	-	197.0			Pottom of Poring at 107.0 ft bas on 1/5/17.15:15		1172	-	-		Pottom of holo -	-
					Bollon of Bonng at 197.0 it bys on 1/5/17 15.15	-					107'	-
						-					Tagged bottom	
						-					of hole at 198'	
						-					1/6/17 at time of	-
						-		1	1	I	well installation	
								1	1	I		
						_		1	1	I		
						_		1	1	I		
						-		1	1	I I		-
						_		1	1	I		
						-		1	1	I		
						-		1	1	I I		-
						-		1	1	I I		
						-		1	1	I I		
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BORING NUMBER: WI-CV-MW13-S

SHEET 1 OF 4

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : NE of Bldg 2807 (437634.6 N, 1200712.1 E)

ELEVATION: 189.3 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : ProSonic 600C, 6" diameter casing, 4" diameter, core barrel

PROJECT NUMBER:

WATER LEVELS : ---START : 1/8/17 09:10 END: 1/8/17 16:00 LOGGER : N. Badon DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 189.3 Cleared with vac truck, no soil description 0.0-5.0' Drilling without 5 5.0 water/drilling 184.3 Silty Sand (SM) 0.0 mud 5.0-6.0' - very dark grayish brown (2.5Y 3/2), moist, medium 4.3 SN-1 dense, fine to coarse, trace, trace fine subrounded gravel 7.0 Poorly Graded Sand (SP) 0.0 6.0-7.0' - very dark gravish brown (2.5Y 3/2), moist, loose, predominately fine, trace coarse Well Graded Sand with Gravel (SW) 7.0-14.0' - very dark grayish brown (2.5Y 3/2), moist, loose, fine to coarse sand and fine to coarse well rounded and 10 rounded gravel, trace cobble 179.3 7.0 SN-2 0.0 No Recovery 15 14.0-17.0' 174.3 17.0 0.0 Well Graded Gravel (GW) with Sand 17.0-22.2' - very dark gravish brown (2.5Y 3/2), moist to dry in . . areas, loose, fine to coarse rounded to well rounded, trace silt 20 169.3 5.2 SN-3 . . • No Recovery 22.2-24.0' 24.0 Silty Gravel with Sand (GM) 0.0 24.0-27.0 - very dark grayish brown (2.5Y 3/2), dry to slightly 25 164.3 moist, loose, fine to coarse gravel, trace cobbles rounded to SN-4 4.5 well rounded 27.0 0.0 Silty Gravel with Sand (GM) 27.0-33.4'- very dark grayish brown (2.5Y 3/2), dry, loose, trace cobbles rounded to well rounded 30



BORING NUMBER: WI-CV-MW13-S

SHEET 2 OF 4

### SOIL BORING LOG

PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : NE of Bldg 2807 (437634.6 N, 1200712.1 E)

ELEVATION: 189.3 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : ProSonic 600C, 6" diameter casing, 4" diameter, core barrel

WATER LEVELS : ---START : 1/8/17 09:10 END: 1/8/17 16:00 LOGGER : N. Badon DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Hole Headspace MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 159.3 9.4 SN-5 0.0 Poorly Graded Sand (SP) 33.4-36.4' - very dark grayish brown (2.5Y 3/2), moist, loose, fine to medium, trace silt 35 154.3 No Recovery 37.0 36.4-37.0' 0.0 Silty Sand (SM) 37.0-47.0° - dark gray (2.5Y 4/1), dry to moist at 45.0° bgs, loose, predominately fine, little fine to coarse gravel, rounded, trace well rounded cobbles, less silt form 45.0' to 47.0' bgs, becoming (SP) 40 149.3 10.0 SN-6 0.0 45 144.3 47.0 Poorly Graded Sand with Silt (SP-SM) Added water to 47.0-51.0' - very dark gray (2.5Y 3/1), moist to dry (alternating), casing - sample loose, trace gravel (fine to coarse) from 50.0' to 51.0' bgs wet from water 5.0 SN-7 50 Bentonite 139.3 Grout Ø 51.0 0.0 Poorly Graded Sand with Silt (SP-SM) 51.0-57.0' - dark gray (2.5Y 4/1), dry to moist alternating, loose, predominately fine-grained, trace fine to coarse gravel (rounded) 6.0 SN-8 55 134.3 0.0 57.0 0.0 Poorly Graded Sand (SP) 57.0-66.5' - dark gray (2.5Y 4/1), moist, loose, some silt lenses throughout and from 65.0' to 66.5' bgs, predominately fine-grained 60



BORING NUMBER: WI-CV-MW13-S

SHEET 3 OF 4

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : NE of Bldg 2807 (437634.6 N, 1200712.1 E)

ELEVATION: 189.3 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C, 6" diameter casing, 4" diameter, core barrel

PROJECT NUMBER:

WATER LEVELS : ---

WATER	LEVELS	3 :		START : 1/8/17 09:10	END	: <u>1/8/</u>	<u>17 16</u>	3:00		LOGG	ER : N. Badon
DEPTH E	BELOW S	EVELS : LOW SURFACE (FT) TERVAL (FT) RECOVERY (FT) 9.5 SN-8 67.0 9.2 SN-1 77.0	,FT)	SOIL DESCRIPTION		U	RF		зs	'	
	INTERVA	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		SOLIC LO	ing Zone	pace	Hole	COMMENTS	WELL DIAGRAM
	1	Í I	SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above F		
129.3_ _ _ _		9.5	SN-9					0.0			
65_ 124.3_											
	67.0			No Recovery 66.5-67.0' Poorly Graded Sand (SP) 67.0-76.2' - dark grayish brown (2.5Y 4/2), slightly moist, loos	 ;e,			0.0			
- 70_ 119.3_ - - - -		9.2	SN-10	very fine to fine, little silt				0.0			
75_ 114.3_ _ _	77.0			No Recovery 76.2-77.0'				0.0			
80_ 109.3_		9.2	SN-11	Poorly Graded Sand (SP) 77.0-86.2' - dark grayish gray (2.5Y 4/2), slightly moist, loose, very fine to fine-grained with occasional silt lenses	,			0.0			
- - - 104.3 - -	87.0			No Recovery	         						
- - - 90		6.3	SN-12	<ul> <li>00.2-07.0</li> <li>Poorly Graded Sand (SP)</li> <li>87.0-91.0' - dark grayish brown (2.5Y 4/2), slightly moist, loos very fine to fine with a few silt lenses about 0.1' thick</li> </ul>	;e, –			0.0			
	l I										



BORING NUMBER: WI-CV-MW13-S

SHEET 4 OF 4

### SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : NE of Bldg 2807 (437634.6 N, 1200712.1 E)

ELEVATION: 189.3 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : ProSonic 600C, 6" diameter casing, 4" diameter, core barrel

V	VATER	LEVELS	8 :		START : 1/8/17 09:10	END	: 1/8/	17 1	6:00		LOGG	ER : N. Badon
ſ	DEPTH E	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION		J	R	PID EADIN	GS		
		INTERV	AL (FT) RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT RELATIVE DENSITY OR		OLIC LO	ng Zone	Dace	łole	COMMENTS	WELL DIAGRAM
				SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above F		
Т	99.3 _	01.0				-						- 12
	- - - - 95_ 94.3_	96.0	6.4	SN-13	Very Fine Silty Sand (SM) 91.0-96.0' - dark grayish brown (2.5Y 4/2), slightly moist, medium dense, cohesive silt lense from 91.9' to 92.3' bgs			- - - - - - - - - - -	0.0			
	-				Silt (ML) 96.0-99.0' - dark grayish brown (2.5Y 4/2), moist, medium dense, cohesive, some very fine sand	-			0.0			
	100 89.3		11.6	SN-14	Poorly Graded Sand with Silt (SP-SM) 99.0-102.0' - dark grayish brown (2.5Y 4/2), moist, loose							  Bentonite - Chips -
					Silt (ML) 102.0-106.5' - dark grayish brown (2.5Y 4/2), moist, medium dense, cohesive, some fine sand			-	0.0			
	105 84.3 _ _ _	107.0			Poorly Graded Sand with Silt (SP-SM)				0.0		Drilled without	
	- - - 110				Poorly Graded Sand with Silt (SP-SM) 107.0-109.5' - dark grayish brown (2.5Y 4/2), wet, medium dense, very fine	/ =  					drilling mud, dry, sample is wet from 107' to 109.5'	
	79.3 _		8.0	SN-15	109.5-113.0' - dark gray (N 4/2), trace fine well rounded grav moist, stiff, cohesive	/el,			0.0			80 - 0.010- Slot Screen
	- 115	115.0			No Recovery 113.0-115.0'	-						
	/4.3				Bottom of Boring at 115.0 ft bgs on 1/8/17 16:00						Bottom of hole = 115.0' - stop 1/8/17	



WI-CV-MW14-M SHEET 1 OF 9

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : Coupeville, WA (439885.8 N, 1200752.6 E)

ELEVATION: 191.6 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Prosonic 600 Sonic 8" x 7" Core Barrel

WAT	ER LEVE	LS:-			START : 1/15/17 09:20	END	: 1/20	0/17	16:14	ŀ	LOGG	ER : D. Well/G. Warren
DEP	H BELOV	SUR	FACE (F	FT)	SOIL DESCRIPTION		Ū.	R	PID EADIN	GS		
	INTE	RVAL (	(FT)		SOIL NAME, USCS GROUP SYMBOL COLOR		IC LO	Zone	m		COMMENTS	WELL DIAGRAM
		RI	ECOVE	RY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		MBOL	athing 2	adspace	we Hole	COMMENT	
101	6 0 0			#/TYPE	Well Ore ded Ore d (OM)		SΥ	Bre	Ч	Abo		873 873
5 186	<ul> <li>▷ _ 0.0</li> <li>-</li> /ul>		5.0	SN-1	Well Graded Sand (SW) 0.0-5.0' - brown (10YR 4/3), moist, loose, fine to coarse-grained sand, fine to coarse subrounded to rounded gravel, few rounded cobbles up to 3.5" diameter, trace silt No Recovery 5.0-6.0'				NA 0.0			
10 181	- - - - - 6_		10.0	SN-2	Well Graded Sand with Gravel (SW) 6.0-11.1' - brown (10YR 4/3), moist, loose, fine to coarse-grained sand, fine to coarse subrounded to rounded gravel, few little cobbles up to 3" diameter, trace silt				0.4			
15 176	- - - - 6_ 16.0	)	10.0		Well Graded Sand with Silt and Gravel (SW) 11.1-15.0' - brown (10YR 4/3), moist, loose, fine to coarse-grained sand, fine to coarse subrounded to rounded gravel, silt Silty Sand (SM) 15.0-16.0' - brown (10YR 4/3), moist, loose to medium dense				0.1			
20 171	- - - - - - - - 6				fine-grained sand Well Graded Sand with Silt and Gravel (SW) 16.0-19.4' - brown (10YR 4/3), moist, medium dense, fine to coarse grained sand, fine to coarse rounded gravel up to 2.9" little cobbles up to 5" diameter, trace clay Poorly Graded Sand (SP) with Gravel 19.4-21.6' - dark gravish brown (10YR 4/2), dry, loose, fine to				0.2		Soil core breaking due to heat of core on	
25		1	10.0	SN-3	medium-grained sand, fine to coarse subangular gravel up to 1" Well Graded Sand with Gravel (SW) 21.6-26.0' - dark gravish brown (10YR 4/2), dry, loose, mediu to coarse-grained sand, fine to coarse subrounded gravel up 1.5" diameter, trace cobbles to 3"						plastic	
25 166	6 26.0   	)			Well Graded Sand with Gravel (SW) 26.0-26.9' - dark grayish brown (10YR 4/2), dry, loose, mediu to coarse-grained sand, fine to coarse subrounded gravel up 1.5" diameter, trace cobbles to 3" Well Graded Sand with Gravel (SW) 26.9-28.2' - gray (2.5Y 5/1), dry, loose, fine to coarse-grained sand, fine to coarse subrounded gravel, silt		••		0.1			
30												





WI-CV-MW14-M SHEET 2 OF 9

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : Coupeville, WA (439885.8 N, 1200752.6 E)

### ELEVATION: 191.6 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Prosonic 600 Sonic 8" x 7" Core Barrel

W	ATER	LEVELS	:		START : 1/15/17 09:20	END	: 1/2	0/17	16:14	1	LOGO	ER : D. Well/G. Warren
DE	EPTH E	BELOW SI	JRFACE (	FT)	SOIL DESCRIPTION		, O	F	PID EADIN	GS		
		INTERVA	L (FT) RECOVE	RY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT. RELATIVE DENSITY OR		30LIC LC	ing Zone	pace	Hole	COMMENTS	WELL DIAGRAM
				SAMPLE #/TYPE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		SYMB	Breathi	Heads	Above I		
1	61.6_ - - - -		8.3	SN-4	Well Graded Gravel with Sand (GW) 28.2-29.7' - gray (2.5Y 5/1), dry, loose, fine to coarse subrounded gravel, fine to coarse-grained sand Well Graded Sand with Gravel (SW) 29.7-34.3' - dark grayish brown (10YR 4/2), dry, loose, fine to coarse-grained sand, fine to coarse subrounded gravel, silt				0.2			
1	35 56.6_	36.0			No Recovery 34.3-36.0'	-			0.0			
		00.0			Well Graded Sand with Gravel (SW) 36.0-41.0' - dark grayish brown (10YR 4/2), dry, loose, fine to coarse-grained sand, fine to coarse subrounded gravel with cobbles, silt			-				
1	40 51.6		10.0	SN-5	Sandy Silt (ML)			-	0.2			
1,	- - 45_ 46.6_	10.0			41.0-41.5' - dark grayish brown (10YR 4/2), moist, medium stiff, fine-grained sand <b>Poorly Graded Sand (SP)</b> 41.5-46.0' - dark grayish brown (10YR 4/2), moist, loose, fine-grained sand, trace silt, trace coarse subrounded gravel 45.0-46.0' bgs	  		- - - -	0.1			
1.	- - - - - - 41.6 - - - - - - - - - - - -	46.0	10.0	SN-6	Well Graded Sand with Silt (SW) 46.0-47.0' - very dark grayish brown (10YR 3/2), moist, loose fine to coarse-grained sand, fine to coarse gravel, silt Silty Sand (SM) 47.0-48.4' - very dark grayish brown (10YR 3/2), moist, loose fine-grained sand, interbedded fine-grained sandy clay Poorly Graded Sand (SP) 48.4-56.0' - dark brown (10YR 3/3), dry, loose, fine-grained sand	, , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, , ,, , ,, , , , , , , , , , , , , , , , , , , ,			0.0			
1	55 36.6_ - - - - - -	56.0			Poorly Graded Sand with Silt (SP-SM) 56.0-56.8' - dark grayish brown (10YR 4/2), moist, medium dense, fine-grained sand Poorly Graded Sand (SP) 56.8-59.2' - dark grayish brown (10YR 4/2), moist, medium dense, trace silt				0.0			
	60											





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WI-CV-MW14-M SHEET 3 OF 9

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : Coupeville, WA (439885.8 N, 1200752.6 E)

### ELEVATION: 191.6 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Prosonic 600 Sonic 8" x 7" Core Barrel

WATEF	R LEVELS	8 :		START : 1/15/17 09:20	END	1/20	0/17	16:14	1	LOGG	ER : D. Well/G. Warren
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		U	R	PID EADIN	GS		
	INTERV	AL (FT)				CLO	ane				
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR		30LI(	ing Zo	pace	Hole	COMMENTS	WELL DIAGRAM
			SAMPLE	CONSISTENCY, SOIL STRUCTURE, MINERALOGY		ΥME	sreath	leads	bove		
131.6			#/TYPE	Silt with Clay and Sand (ML)	/	////	-	0.0	4		
-		8.0	SN-7	59.2-60.0' - dark grayish brown (10YR 4/2), moist, stiff		ļļļ					
-	-			Clay with Silt (CL)	-						- 🛛 🖓
-	-			fine-grained sand, low plasticity							
-				Silt with Sand (ML) 60 4-61 0' - dark gravish brown (10YR 4/2) moist stiff							
-	-			fine-grained sand		1.1.1					- 14 16
65_	-			\ Poorly Graded Sand (SP) \ 61.0-64.0' - dark gravish brown (10YR 4/2), drv. loose, trace							
126.6	66.0			silt				0.0			- 🛛 🖓
				<b>No Recovery</b> ∖64.0-66.0'	/-					66.0-76.0' core	
				Poorly Graded Sand (SP)						recovered o	
-	-			66.0-76.0' - dark grayish brown (10YR 4/2), dry, loose, fine-grained, trace silt	-					1/15/16	- 14 16
-	-			-	_						
70	-				-						- 🕅 🕅
121.6	-				_			0.1			
-	-	10.0	SN-8		-						- 🕅 🕅
-	_				_						
-					_						
-	-				-						- 🕅 🕅
	-				_						
75 116.6	-							0.1			X X -
-	76.0			Dearby Creded Candwith Silt (SD SM)		L. L.					
-				76.0-77.2' - dark grayish brown (10YR 4/2), moist, loose,	_	티는					Grout -
-	-			fine-grained sand, trace weakly cementation							- 🕅 🕅
	-			77.2-77.6' - dark grayish brown (10YR 4/2), moist, stiff,	/_						
-	-			\fine-grained sand							- 🕅 🕅
80				77.6-84.1' - dark grayish brown (10YR 4/2), dry, loose,							
111.6	-	0.1	CN O	fine-grained sand, trace silt	-			0.0			- 🕅 🕅
-	-	0.1	214-8		_						
					_						
-	_				-						- X X
					_						
85	1			No Recovery 84 1-86 0'	_						- 🕅 🖓
106.6					_			0.0			× × -
	00.0			Poorly Graded Sand (SP)	_						
-	-			86.0-96.0' - dark grayish brown (10YR 4/2), dry, loose, fine-grained sand, trace silt	-						- 1X I
	1			into granted ound, trace on	_						
.	-				-						- 🕅 🕅
00	1				_						× × -
90						<u> </u>		╞			



BORING NUMBER: WI-CV-MW14-M

SHEET 4 OF 9

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

#### LOCATION : Coupeville, WA (439885.8 N, 1200752.6 E)

ELEVATION: 191.6 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Prosonic 600 Sonic 8" x 7" Core Barrel

WATER LEVELS : ---START : 1/15/17 09:20 END: 1/20/17 16:14 LOGGER : D. Well/G. Warren DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 101.6 10.0 SN-10 95 96.6 0.1 96.0 Silt (ML) 96.0-98.2' - dark grayish brown (10YR 4/2), moist, interbedded fine sand lense, stiff Silty Sand (SM) 98.2-105.1' - dark grayish brown (10YR 4/2), moist, medium dense, very fine-grained sand 100 91.6 0.1 9.1 SN-11 105 0.1 86.6 No Recovery 106.0 105.1-106.0 Silt with Sand (ML) 106.0-106.6' - dark grayish brown (10YR 4/2), moist, stiff, fine-grained sand Clay (CL) 106.6-107.5' - olive brown (2.5Y 4/3), moist, very stiff, some silt, low plasticity Silt/Clay (ML/CL) 107.5-111.5' - olive brown (2.5Y 4/3), moist, stiff, low plasticity 110 0.0 81.6 10.0 SN-12 Silt (ML) 111.5-112.0' - dark olive gray (5YR 3/2), moist, stiff, little clay Clay (CL) 112.0-113.2' - dark olive gray (5YR 3/2), moist, very stiff, little silt, low plasticity Silt (ML) 115 113.2-114.2' - dark olive gray (5YR 3/2), stiff 0.0 76.6 Clay (CL) 116.0 114.2-115.7' - dark olive gray (5YR 3/2), moist, stiff, low plasticity Silt (ML) 115.7-116.0' - olive brown (2.5Y 4/3), dry, very stiff, clay laminae, very cohesive, weakly cemented Clay with Sand and Gravel (CL) 116.0-116.5' - dark grayish brown (10YR 4/2), moist, stiff, fine-grained sand, fine subrounded gravel 120





WI-CV-MW14-M SHEET 5 OF 9

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : Coupeville, WA (439885.8 N, 1200752.6 E)

### ELEVATION: 191.6 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Prosonic 600 Sonic 8" x 7" Core Barrel

WATEF	R LEVELS	S :		START : 1/15/17 09:20	END	: 1/2	0/17	16:14	ļ	LOGO	ER : D. Well/G. Warren
DEPTH	BELOW S	URFACE (	FT)	SOIL DESCRIPTION		U	R	PID EADIN	GS		
1	INTERV	AL (FT)				Ĩ	ē				
		RECOVE	ERY (FT)	SOIL NAME, USCS GROUP SYMBOL, COLOR,			ig Zor	ace	ole	COMMENTS	WELL DIAGRAM
			SAMDI E	CONSISTENCY, SOIL STRUCTURE, MINERALOG	/	MB	eathir	adsp	Dve H		
			#/TYPE			Ś	ä	Ĭ	ΡP		
/1.6	-	40.0	011.40	Silty Sand with Gravel (SM)   116.5-117.0' - dark gravish brown (10YR 4/2), moist, dense	.   _			0.0			- X
-		10.0	SIN-13	fine-grained sand, fine rounded gravel, angular cobbles ~3.	5"    <u> </u> _	티는					
-	-			Graneter Well Graded Sand with Gravel (SW)							99 -
-				117.0-119.0' - dark grayish brown (10YR 4/2), moist, dense	, ∥[_						
-	-			fine to coarse-grained sand, fine gravel, trace silt							- 🎗 🕅
				119.0-120.5' - dark gravish brown (10YR 4/2), moist, dense	.   -						
125	-			fine-grained, trace fine to coarse gravel, angular to subroun	ded			0.0			
	126.0			Poorly Graded Sand with Silt (SP-SM)	. [_						
-	_			fine-grained sand, fine to coarse subrounded to rounded gra	, avel –						-
				Well Graded Sand with Gravel (SW)	_						
-	-			dense, fine to coarse-grained sand, fine to coarse gravel,	-						- X X
-	_			rounded, trace cobbles, 2" diameter							
120	-			126.0-126.5' - dark gravish brown (10YR 4/2), moist to wet,	-						- 18
61.6				dense, fine to coarse-grained sand, fine to coarse gravel,	-			0.0			
-		10.0	SN-14	Poorly Graded Sand (SP)						Llord drilling	
-	-			126.5-136.0' - dark grayish brown (10YR 4/2), moist, loose,	-					131.0-135.0'	- 12
-				fine-grained sand, trace silt, trace interbedded silty sand thin lenses	n _		:				
	-				-						- 2
					_		:				
135	-				-						- 18
56.6	100.0				_			0.0			
-	136.0			Poorly Graded Sand (SP)							- 18
-				136.0-137.5' - dark grayish brown (10YR 4/2) to dark gray	_						
-	-			(10 YR 4/1), wet, dense, fine-grained sand, trace slit				0.0			- 18
-				137.5-146.0'	_						
-	-				-						- X
140											
51.6	-		o		-					Last sample	- 🕅 🕅
	-	1.5	SN-15		_					flapper valve	
	-				-		1				- 🕅 -
	1				-		1				
	-				-		1	1			- 12
	1				_		1				
145 46 6	-						1	NA		Sample lens at	
	146.0						1			tip	
-	-			Poorly Graded Sand (SP) 146 0-152 2' - dark gravish brown (10YR 4/2) to dark grav	-		]				- 🕅 🕅
	1			(10YR 4/1), wet, dense, fine-grained sand, trace silt	_		1				
-	-				-						- 12
1 1	1				-		1				
150	-				-						
130							$\mathbf{I}$				



BORING NUMBER: WI-CV-MW14-M

SHEET 6 OF 9

## SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439885.8 N, 1200752.6 E)

ELEVATION: 191.6 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Prosonic 600 Sonic 8" x 7" Core Barrel

WATER LEVELS : ---START : 1/15/17 09:20 END: 1/20/17 16:14 LOGGER : D. Well/G. Warren DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR Breathing CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE 41.6 n n 6.2 SN-16 0.0 No Recovery 152.2-156.0' 155 36.6 0.0 Bentonite 156.0 Poorly Graded Sand (SP) Chips 156.0-163.5' - dark gray (10YR 4/1) to dark grayish brown (10YR 4/2), moist, dense, fine-grained sand, trace silt 160 20/40 Sand 31.6 7.5 SN-17 0.0 No Recovery 163.5-166.0' 165 26.6 166.0 Poorly Graded Sand (SP) Schedule 166.0-169.3' - dark grayish brown (10YR 4/2), moist, dense, 80 - 0.010 fine-grained sand Slot Screen Poorly Graded Sand (SP) 170 169.3-172.8' - very dark gray (3/N), moist, dense, fine grained 0.0 21.6 10.0 SN-18 Silt (ML) 172.8-173.8' - dark gray (4/N), moist, stiff, trace fine-grained sand Silty Sand (SM) 175 173.8-174.8' - dark gray (4/N), moist, dense, very fine-grained 0.0 16.6 Silt (ML) 176.0 174.8-175.6' - dark gray (4/N), moist, stiff Silty Sand (SM) 177.0-186.0' coe 175.6-175.8' - dark gray (4/N), moist, dense, very fine-grained lost in borehole Silt (ML) during retrieval 175.8-176.0' - dark gray (4/N), moist, stiff 0.0 180



ch2m

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WI-CV-MW14-M SHEET 7 OF 9

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

### LOCATION : Coupeville, WA (439885.8 N, 1200752.6 E)

ELEVATION: 191.6 ft

DRILLING CONTRACTOR : Cascade Drilling

DRILLING METHOD AND EQUIPMENT : Prosonic 600 Sonic 8" x 7" Core Barrel

WATEF	R LEVELS	S:		START : 1/15/17 09:20	END	: 1/2	0/17	16:14	1	LOGG	<u>ER : D. Well/G. War</u>	ren
DEPTH	BELOW S	URFACE (	(FT)	SOIL DESCRIPTION					~~			
1						ő	R		33			
1	INTERV					l o	one			COMMENTS		
		RECOVE	ERY (FT)	MOISTURE CONTENT, RELATIVE DENSITY OR		D D	ng Z	pace	우	COMMENTS		
1				CONSISTENCY, SOIL STRUCTURE, MINERALOGY	,	Ř	eath	sads	ove			
L			#/TYPE			Ś	Bř	Ľ	Abc			
11.6				Silty Sand (SM)	_							
- I		30	SN-19	176.0-179.0' - dark gray (4/N), moist, dense, very fine-grain	ed 🛛 _							_
-	-	0.0	0.11.10	sand								_
-	-			No Recovery	-							_
-	-			179.0-186.0	-							-
-					-							-
					_							
405 -	_				-							_
185					_	1						
0.0	186.0				-							-
-	100.0			Silty Sand (SM)						Verv hard drilling		-
				186.0-187.0' - dark gray (4/N), moist to wet (drill fluids), loos	se, _					186.0-176.0',		_
-				very fine-grained sand	/_					lots of rig		_
- 1	-			Poorly Graded Sand (SP)	-		1			"cnatter"		_
1 -	-			187.0-188.5' - dark gray (4/N), moist, loose, fine to	_	V//						-
1 -	1				/ -	V//						-
190				188 5-196 0' - gray (5/N) dry to moist stiff trace silt low	-	V//						_
1.6				plasticity	_	V//		0.0				
-		10.0	SN-20	[· · · · · · ·	_	<i>V//</i>						_
-	-		0.11 20		-	<i>V//</i>						-
-	-				-	V//						-
-					-	V//						-
-	-				-	V//						-
					_	V//						
					_	<i>V//</i>						_
195	-					<i>V//</i>		0.0				
-3.4	196.0				-	V//		0.0				_
-	130.0			Silt (ML)		<b>Y</b> ///	1			Run 6" x 4"		-
-				196.0-203.5' - very dark gray (5Y 3/1), moist, stiff, trace	-					casing/core		-
				clay/mica flakes	_					barrel going		
-	-				-					forward		_
-	-				-							-
	1				-	1	1	1	1			-
200	1				-	1	1					-
-8.4	]				_	1	1	0.0				
	-	19.0	SN-21		_		1					_
- 1	-				-		1					_
	-				-		1					-
1 -					-	1	1					-
	]							1	Í			
1 -	-			Silt (ML)	_	<b> </b>   ]	1					-
205	-			203.5-204.2' - dark gray (4/N), moist, stiff			1					-
-13 4	-			Silt with Sand (ML)	7	$\downarrow \downarrow \downarrow$		0.0				
10.4	206.0				/ -	V//						-
1 -				205 0-206 0' - dark grav (4/N) dry to moist stiff low plastici	tv /	<b>V</b> ///	1			20' run		_
1 1				Clav (CI)	<u>.y</u> /	V//	1					
1 -	-			206.0-216.0' - dark gray (4/N). moist to wet, soft to very stiff.	_	<i>V//</i>	1					_
1 -	-			low to moderate plasticity, trace silt	_	<i>V//</i>	1					_
	-				-	<i>V//</i>	1					-
1 -	1				-	V//	1					-
210						V//	1					



BORING NUMBER: WI-CV-MW14-M

SHEET 8 OF 9

# SOIL BORING LOG

#### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439885.8 N, 1200752.6 E)

ELEVATION: 191.6 ft

DRILLING CONTRACTOR : Cascade Drilling

#### DRILLING METHOD AND EQUIPMENT : Prosonic 600 Sonic 8" x 7" Core Barrel

WATER LEVELS : ---START : 1/15/17 09:20 END: 1/20/17 16:14 LOGGER : D. Well/G. Warren DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION PID READINGS LOG INTERVAL (FT) SYMBOLIC WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, COMMENTS RECOVERY (FT) Headspace Hole Breathing 2 MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE -18.4 n n 10.0 SN-22 215 -23.4 0.1 216.0 Clay (CL) 216-226.0' - dark gray (4/N), dry to moist, stiff, low to moderate plasticity, trace silt, organic odor 220 -28.4 0.0 10.0 SN-23 225 0.0 -33.4 226.0 Clay (CL) 226.0-230.0' - dark gray (4/N), moist, stiff, low plasticity, organic odor 230 0.2 -38.4 Silt with Clay (CL) 230.0-235.0' - dark gray (4/N), moist, organic odor 10.0 SN-24 235 -43.4 Clay with Silt (CL) 0.1 236.0 235.0-246.0' - dark gray (4/N), moist, stiff to very stiff, low plasticity, organic odor 240



BORING NUMBER: WI-CV-MW14-M

SHEET 9 OF 9

# SOIL BORING LOG

### PROJECT : NAS Whidbey Island OLF Coupville

LOCATION : Coupeville, WA (439885.8 N, 1200752.6 E)

ELEVATION: 191.6 ft

DRILLING CONTRACTOR : Cascade Drilling

### DRILLING METHOD AND EQUIPMENT : Prosonic 600 Sonic 8" x 7" Core Barrel

WATER LEVELS : ---START : 1/15/17 09:20 END: 1/20/17 16:14 LOGGER : D. Well/G. Warren PID READINGS DEPTH BELOW SURFACE (FT) SOIL DESCRIPTION LOG INTERVAL (FT) SYMBOLIC | WELL DIAGRAM SOIL NAME, USCS GROUP SYMBOL, COLOR, Breathing Zon COMMENTS RECOVERY (FT) Headspace Hole MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY Above I SAMPLE #/TYPE -48.4 0 3 10.0 SN-25 245 -53.4 0.2 246.0 Clay (CL) 246.0-266.00' - dark gray (4/N), dry to moist, stiff, low plasticity, interbedded with with clay lenses 250 -58.4 0.0 10.0 SN-26 255 0.0 -63.4 256.0 260 0.0 -68.4 10.0 SN-27 265 -73.4 0.0 266.0 Bottom of Boring at 266.0 ft bgs on 1/20/17 16:14

Attachment 2 Development Logs



2 Liters = (1.53ga)

神経をかい	動産ないた		-	WELL DEV	ELOPMENT	DATA SHEE	NI NI		ATTACTOR OF A
lient:	NAVFAC	_		Proje	Well ID: 1	WI-CV-MW 0	I-D		
ocation:	OLF Coupeville				Sample ID: 1	NA			
vent:	Well Developme			Samo	ling Team:	Melan	4 Drcki	sch	
ate:	V05/1.	t Alur	Indu	Sauch		1 Sector	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		
eduler:	-iser, pc	arrige	d				1000	Carlos -	
tal Death		Before	Atter	T.(BTOC)		Mea	suring Device:	YST	Les Martin
apth to wate	er: (-)			T.(BTOC)				Turbidu	ty meter
ater Colum	n: 17	1		न.		M-11 D/-	Volume		
	(x)			GAL/FT.		well Dia.	(asilone/feet)		
ell Volume:	24	-		GAL.		(inches)	(galions/100t)		
stal Purge V	ol.:			GAL.	1	1 25	0.041		
		MIN	1100			2	0.163		
irge Device	· 3·	rtbau	ur +		10	4	0.653		
		mega	Monso	on pun	4	6	1.469		
	-27		a spilar a	FII	LDPARAM	ETERS	a the part of the	1 40 . 0 .	
Time	Purge Vol.	Temp.	Cond.	DO	pH	ORP	Turbidity	Other: DTN	Color / Odor / Commer
rime	(gals)	°C	mS/cm	mg/L	SU	mV	NTU	Carlos Print	Contract Agence when some party
Stabilizati	on Criteria	constant	± 3%	± 10%	±0.1	± 10 mv	<10	and the second second	5 - 39, 6 - 80 - 1
2:30	6.0	12.51	0.376	0.19	7.99	- 440	20	INAA	
7.32	54.75	13.22	0.375	0.13	7.11	-410	UTIT	111.1	
2.40	60.5	3.51	0.375	0.12	7.99	151	Tap	150	
2.12	10 0.00	12.20	0.613	0.10	7.11	=740	292	120	
3:20	60.20	132	0.200	0.11	7.19	- 12-1	79.0	150.2	
12:00	72 00	12 60	(). 273	0.10	100	- 420	490	100.5	
13:05	7-7-25	2.58	0.22	0.10	200	-410	95.4	1000	
13:10	81.0	12.00	0.323	0.11	2.99	-401	30.2	150.4	
3:15	84.75	2.61	0.370	6.11	7.94	-458	29.2		
13:20	88.50	12.6	0.371	0.11	7.99	- 409	43.6	150.65	ī — — — — — — — — — — — — — — — — — — —
13:25	92.25	12.50	0.36	0.12	7.90	1-412	43.4	146.5	
13:30	96.0	12.85	0.369	2.50	8.00	- 224	54.5		
13:35	19.75	12.84	0.369	2.34	8.00	- 362	6.39	146.5	
13:40	103.5	12.85	0.36	2.13	0.00	-337	112.4		
12:45	107.25	12.80	0.370	1.94	8.00	-323	17.7	146.4	-
13:50	11.0	19.85	0.307	1.71	8.00	1-327	30.0		
Poiss	114.75	Dur	a Start Time	11.15	5	1		146.5	
S/N I	4FIDIDA	Purg	e start time:	11:3	U	-	Purge Rate	):	
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ature(s):	In	~ 1	2-	0.40		-			
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Client	NAVEAC			WELL DE	VELOPMEN	T DATA SHE	ET	- Paul Anto			
Location	OLE COUR	ovillo		- Proj	Well ID	WI_CV_MW	21-11				
Event	Wall Down	lonmont		-	Sample ID						
Date:	I COLL	aopment		- Cam	pling Team	Malan	TO DITYIS	SOM	1		
Weatha	1/24/	Cloudy	- manau	Sam	Sampling Team: MKIMMLD1945011						
weather	45°P	adding	+ Fugge	-							
alde		Before	After					1.000			
5 Total De	oth:	1669	11073	FT.(BTOC)		M	easuring Device:	YSP			
Depth to	water:	10124.4	124.4	FT.(BTOC)		Tarbidity Mett					
Water C	olumn:	42.5	42.9	FT.				Ise fulling book			
		(x) . 162		GAL/FT.		Well Dia.	Volume				
Well Volume: 10.93				GAL.		(inches)	(gallons/foot)	in spece)			
Total Pu	rae Vol.:	69.3		GAL.		1	0.041				
		0110		• (*****		1.25	0.064				
Purge D	evice:	3ft Ball	or			(2)	0.163	1			
. uige b		MACION	MEACH	unn		4	0.653				
		megnin	iscurp	minp		6	1.469		-1995-1997		
				FI	ELD PARAN	ETERS	-	the second s	an Alexandra		
-	Purce V	I. Temn	Cond		nH	ORP	Turbidity	all DTL	0.1		
Time	(nals)	°C	mS/cm	mo/l	SU	mV	NTU	Other: UIW	Color / Odor / Comme		
Stabi	ization Criteria	Constant	+ 3%	+ 10%	+0.1	± 10 my	<10	· · · · ·	1 Same marine		
08:4	81		1999 J.						stan-suraino		
00.0	\$								stop surding		
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Observatio	ns/Notes: 47	5. Purg	e Start Time:	13:25		u.e.c.	Purge Rate:	21140	SIMIN		
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-	in when a	-	10 A 2 -	WELL DE	VELOPMEN	T DATA SHE	ET				
lient:	NAVFAC	Contraction of the local division of the loc		Project Number: 679580.09.FI.WI							
ocation:	<b>OLF</b> Coupevill	e		Well ID: WI-CV-MW OV ~ M							
ent:	Well Developm	nent			Sample ID: NA						
te:	1/25/17			Sam	pling Team:	Melance provisori					
eather:	HSFIC	loudy		2.14							
5.2. 27		Before	After	ET (BTOC)		Me	asuring Device:	YSE			
otal Depth:	77	160.7	IQT.J	FT (BTOC)				Turbio	uty meter		
epth to wat	er: <u>(-)</u>	134.4	129.9	FT					5		
ater Colum	n: (**)	42.2	yar 1	GAL/FT.		Well Dia.	Volume				
	<u>(x)</u>	1 92	1	GAL		(inches) 1	(gailons/foot) 0.041				
ell volume	/al. —	6.12		GAL.				10.000			
nai Purge		01.0				1.25	0.064	1			
Iran Device		nonan	onsocr	1 pum	0	2	0.163	- S			
uige Device	. +	mj.u.		1.1		4	0.653				
						6	1.469				
	XQ and the		IT AT	F	ELD PARAM	ETERS			the second second		
T	Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	Other: DTW	Color / Odor / Commen		
lime	(gals)	°C	mS/cm	mg/L	SU	mV	NTU				
Stabilizat	ion Criteria	constant	± 3%	± 10%	±0.1	± 10 mv	<10				
15:15	95	12.03	0.491	0.14	7.98	- 425	7.04				
15:20	97.5	12.13	0.491	0.13	7.97	-990	6.59	124 10			
15:25	100	12.01	0.491	0.12	7.91	- 5-15	6.0	127.0			
15:30	102.5	12.19	0.44	0.11	1.11	-21/	2. 20				
15:35	105	12.12	0.99	0.10	197	-503	172	124.6	Stop-Done		
12.40	107.5	14.15	0.14	0.01	7714	- 30 2	1.100	100.1.4			
					1.000						
					1						
-							10000				
-											
1							1.000				
				-		-					
servations/	Notes:	Puro	e Start Time:	13:25			Purge Rate:	JUAN			
I S/N	4F10102	3		12.0.1			and a second	6 - 00	11		
-	CONTRACTOR INC.							0.59	min		
	C-10312	0									
	10.000	2A2									
-(a)outon	1	n 1	-								

2L~ 5gattons (1) 2.59910.5991/min 10991 5min

1.75 drums full

95 gal about
lient:	NAVFAC	ello anh		WELL DE	VELOPMENT ect Number	679580.09 F	ET	¥			
ocation:	OLF Coupeville	3		i i oj	Well ID:	WI-CV-MW/	12-D M				
vent:	Well Developm	nent			Sample ID:	le ID: NA					
ate:	1261	[7-		Sam	pling Team:	m: MPIGNIO DICKIECO					
leather:	450=	pan-ly	Clundy	F							
		Before	After	•				Ver			
otal Depth: epth to wate	er: (-)	1+0.00	1022	FT.(BTOC) FT (BTOC)		Me	easuring Device:	761	HI ANDER		
ater Colum	n:	46.25	45.9	FT.				Cen .	Preidlad		
lall 3 fa1	<u>(x)</u>	0.163		GAL/FT.		Well Dia.	Volume	hook	forcorts		
otal Purce V	/ol.: —	7.54		GAL. GAI		(inches)	(gallons/foot)	UUUF	and apres		
<u>-</u>		791		-		1.25	0.041				
urge Device	: ?	sft Bai	ler+ 1	rega		(2)	0.163				
•		M771	5001 0	und		4	0.653				
						6	1.469				
2.50 P. 27	Buree Vel	Terre	Cond	FI	ELD PARAM	ETERS	T. 1114	aut -			
Time	ruge vol. (gals)	remp. °C	Uond.	DU ma/l	PH SII		LUTDIDITY	Other:	Color / Odor / Commer		
Stabilizati	on Criteria	constant	± 3%	± 10%	± 0.1	± 10 mv	<10	ALTER SIDE	I The attention to the		
11:65									statesuraino		
12:05									Stop surging		
12:50	~6						21,000				
12.15									start surging		
12:25	~7.5								Stop Silliging		
13:55							71.000		g-aft- number		
13:58	9						315	124.1			
14:05	12.5	12.25	0.481	6.90	7.99	-315	150				
14:10	_ 15_	13.39	0.482	3.13	8.03	-399	86.6	124.0			
14.15	-17.5	12.20	<u>() · 455</u>	1. R	8.05	-426	60.6	124.0			
11.15	205		0.402	0.69	8.03	-420	57.5	124.0			
14:30	25	12 26	0.484	0.27	<u>6.03</u>	-11211	20.9	12.01			
14:35	17.5	12.34	0.483	0.23	8.02	- 421	49.7				
14:40	30	12.28	0.483	0.19	8.07	-435	48.0				
14:45	32.5	12.22	0.494	0.7	9.00	-434	47.3				
14:50	35	<u></u>	<u>0.4941</u>	0.16	8.00	K-433	45.3	124.0			
servations/	NOIES:	Purgi ን	e Start Time: _	13:5	<u> </u>	•	Purge Rate:	0.539	al/min		
								pur	nding		
	C-10312	0						1	1.7		
			-								
anature(s):	1/17	<u> </u>					·				
<u></u>		<u> </u>									
								NUte	r		
- NAM	BJ.R.R	000							- 		
14444	M	S- 0.0						30 &	20		
7 NL 1	baller		- (1)	Canl							
241	me		1000	JUL							
	A INI HI										

0	CH2MHILL
-	

		SHET (PR. 12		WELL DE	VELOPMENT	DATA SHE	T.		and the second second
Client:	NAVFAC			Proje	ect Number:	679580.09.F	.WI 32/4	<del>th</del> 4	
Location:	OLF Coupevill	e			Well ID:	WI-CV-MWC	N3-20		
Event:	Well Developm	ient			Sample ID:	<u>NA</u>			
Date: Noothor:		ZCH MD	1/26	Samp	oling Team:	Melan	i Dreki	son	
vedulei.	-450-0-1	MANY L	round	-					
		Before	After						
Total Depth:		1+0.00	169.6	FT.(BTOC)		Me	asuring Device:	_YSE	
Depth to wat	er: <u>(-)</u>	123 22	129.7	FT.(BTOC)				Turbid	ity Meter
Vater Colum	in:	46.25	45.9	FT.				Isee	IND FIOIN
	<u>(x)</u>	0.163	· 1	GAL/FT.		Well Dia.	Volume		
Vell Volume	: <u> </u>	7,45		GAL.		(inches)	(gallons/foot)	10	white specs
otal Purge \	/ol.:	75.4		GAL.		1	0.041		
						1,25	0.064	1	
Purge Device	: 2	sftbau	lert1	nega		(2)	0.163		
		monsor	mour	ากั		4	0.653		
			1 1000	17		6	1.469		
				Fli	ELD PARAM	ETERS	hain a start	学生动作	
Timo	Purge Vol.	Temp.	Cond.	DO	ρН	ORP	Turbidity	Other Mark	0-1
	(gals)	°C	mS/cm	mg/L	SU	mV	NTU		Color / Caor / Comments
Stabilizat	ion Criteria	constant	± 3%	±10%	± 0.1	± 10 mv	<10	(1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,	STREET, PROVIDENT
15:00	40	12.27	0.483	0.14	8.01	-439	41.0		
15:10	1_ 45	12.29	0.485	0.14	2.00	- 443	28.9	124.0	
15:20	50 -	12.28	0.484	6-1	8.00	-444	7.9		
15:30	55600	012.29	0.485	0.07	B-00	-450	10.4		
15:40	57.5	12.29	0.482	0.00	8.00	-462	10.59	124.0	
15:45	60	12.29	0.484	0.00	8.00	- 458	4.71	124.0	
15:50	62.5	12.30	0.483	0.06	8.00	-462	3.49	1241	
15:50									Wellmmidlete.
					$\sim$		TAD)		<b>├───</b>
					$\sim$				
									······
Observations/	Notes:	Purg	e Start Time:	13:5	56		Purge Rate:	0.5399	1/min
(SIS/N _	14110100	30						1	
	0-1621	20							
	0-10-01								
Signature(s):	ALOVO	KA A	An.	~					
<u></u>	Truck		1-V-V						
	1								

ent:		and the second second		WELL DE	/ELOPMEN	T DATA SHE	न संस्थित व	1. 18 M.	M. B. Levin and B. A.		
	NAVFAC			Proje	ct Number:	679580.09.F	I.WI 9-1	4la			
cation:	OLF Coupeville	1		Well ID: WI-CV-MWOU-B M							
ent:	Well Developm	ent		Sample ID: NA							
te:	VIOIT		0.011	Samp	ling Team:	Melann	CIACHS	)			
atner:	45°F, CLD	uay, pa	<u>ung</u>								
tal Depth: pth to wate	er: (·)	Before 69.7 123.9	After 169.5 109.4	FT.(BTOC) FT.(BTOC)		Me	easuring Device:	YSE	utu Meter		
ter Colum	n:	45.4		FT.				1500-	Field hook to		
	<u>(x)</u>	0.163		GAL/FT.		Well Dia.	Volume	504	CHICA LUMS)		
ell Volume:		7.48		GAL.		(inches)	(gallons/foot)	SPI			
tal Purge <b>\</b>	/ol.: 7	4.8		GAL.		1	0.041				
		_				1,25	0.064				
rge Device	: J	FH BC	allor			(2)	0.163				
•						4	0.653				
						6	1.469				
	Sal As a L	Section of the	1-1-14	FIE		ETERS		1. F. H.			
Time	Purge Vol.	Temp.	Cond.	DO	рН	ORP	Turbidity	Other	0.1.101.10		
11116	(gals)	°C	mS/cm	mg/L	SU	mV	NTU	Uner:			
Stabilizati	on Criteria	constant	± 3%	±10%	± 0.1	± 10 mv	<10	с.П.	- RE-RAL - AND		
9:53									Staff Surain		
0:05									- Ann sumin		
0:15									- FIND- AHMI		
0:25									- DAD SUM		
11:28	2.75						7 000		- SICH OMA		
12:07	5 60						21.000				
12:20	0 25						51000		-LOO-CURAU		
12.20	2.0						1,000		- STUTE SWIGH		
12.51	11 0(2						21 0072		- MOD SURGE		
15.01							$\mathcal{I},\mathcal{O}\mathcal{O}$				
115	13170						$\geq 1,000$				
14.10									-start-Sural		
4.90									-stop sural		
14 28	16.50						21.006				
15 FF	19.25					<u></u>	21.000				
16:18									- start surgi		
15.20									- Stap Sturge		
15:54	22.00						21,000				
servations/	Notes:	Purg	e Start Time:	10:25	5		Purge Rate:	2.750	al /~20 Mil		
IS/N	6-10312	Ú Č				-	·				
	Drohe MO	der.						(a	pproximately		
	tal Depth: pth to wate ter Colume: ter Colume: tal Purge V rge Device Time Stabilizati 1:53 0:05 0:25 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:3:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:07 1:5:0	Lail Depth:       I         pth to water:       (-)         pth to water:       (-)         ter Column:       (x)         ter Column:       (x)         ter Column:       (x)         tal Purge Vol.:       7         rge Device:       3         Time       Purge Vol.         (gals)       Stabilization Criteria         1:53       (-)         0:05       (-)         0:25       (-)         1:30       2.75         1:30       2.75         1:30       2.75         1:30       2.75         1:30       2.75         1:30       2.75         1:30       2.75         1:30       2.75         1:30       2.75         1:30       2.75         1:30       1.00         1:415       13.75         1:415       13.75         1:415       13.75         1:415       1.00         1:45       1.00         1:45       1.00         1:57       1.00         1:57       1.00         1:57       1.00 <t< td=""><td>Before       I($\mathcal{Q}q$, 7         pth to water:       (·) 12.3 · (b)         pth to water:       (·) 13 · (b)         &lt;</td><td>Image: Second secon</td><td>Before       After         tal Depth:       $[(gq, 7)](gq, gq, gq, gq, gq, gq, gq, gq, gq, gq,$</td><td>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</td><td>Before       After         Ial Depth:       $[(g_1, 7+1)(g_2, 5)]$       FT.(BTOC)       Me         pth to water:       $(f_1, 2, 3, 5)$ $1 a a d f$       FT.       Before       After         ter Column:       $45, 9$ $f a a d f$       GAL/FT.       Well Dia.       (inches)         ter Column:       $45, 9$       GAL/FT.       GAL/FT.       Well Dia.       (inches)         tal Purge Vol.:       $74, 9$       GAL.       1       1.25         rge Device:       $3-f f$       Ba(d) f       (inches)       1         Time       Purge Vol.       Temp.       Cond.       DO       pH       ORP         MV       Stabilization Criteria       constant       $\pm 3\%$ $\pm 10\%$ $\pm 0.1$ $\pm 10$ mv         Stabilization Criteria       constant       $\pm 3\%$ $\pm 10\%$ $\pm 0.1$ $\pm 10$ mv         13: 34       $2.75$ </td><td>Interview of the second seco</td><td>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</td></t<>	Before       I( $\mathcal{Q}q$ , 7         pth to water:       (·) 12.3 · (b)         pth to water:       (·) 13 · (b)         <	Image: Second secon	Before       After         tal Depth: $[(gq, 7)](gq, gq, gq, gq, gq, gq, gq, gq, gq, gq, $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Before       After         Ial Depth: $[(g_1, 7+1)(g_2, 5)]$ FT.(BTOC)       Me         pth to water: $(f_1, 2, 3, 5)$ $1 a a d f$ FT.       Before       After         ter Column: $45, 9$ $f a a d f$ GAL/FT.       Well Dia.       (inches)         ter Column: $45, 9$ GAL/FT.       GAL/FT.       Well Dia.       (inches)         tal Purge Vol.: $74, 9$ GAL.       1       1.25         rge Device: $3-f f$ Ba(d) f       (inches)       1         Time       Purge Vol.       Temp.       Cond.       DO       pH       ORP         MV       Stabilization Criteria       constant $\pm 3\%$ $\pm 10\%$ $\pm 0.1$ $\pm 10$ mv         Stabilization Criteria       constant $\pm 3\%$ $\pm 10\%$ $\pm 0.1$ $\pm 10$ mv         13: 34 $2.75$	Interview of the second seco	$\begin{array}{c c c c c c c c c c c c c c c c c c c $		

* 5 ft. Bailer would not go all the way to the bottom, -> Potential Knick, bend in well piping - make note for Auture sampling.

1.150	Neller				WELL DE	/ELOPMEN	T DATA SHE	ET	a sub-	Superior Strategies		
Client:		NAVFAC			Proje	ect Number:	679580.09.F	I.WI 021	24(17)			
Locatio	on:	OLF Coupevill	e		Well ID: WI-CV-MWO2-DM							
Event:		Well Developm	nent			Sample ID:	NA					
Date:		VIOIT	u Len des	Round	Samp	bling Team:	Melan	<u>e Dickrs</u>	<u>m</u>			
weathe	8F: .	75º F, C	www.	Dairy								
Total D	epth:		Before	After	FT.(BTOC)		Me	easuring Device:	YSE			
Water C	co wati Colum	er: <u>(-)</u>	172.8	100.4	FI.(BIUU)				Traplat	M Meter		
TTALEI	COILIN	····	<u>4 514</u>		CAL/ET		Well Dia	Voluma	(see th	eta book te		
Well Vo	nlume:	<u> </u>	7.40	<u> </u>	GALIFT.		(inches)	(aplione/foot)	5 SPEC	itications)		
Total P	urae V	/ol: —			GAL.				6	2		
	9+ .		7-1-7	-			1 25	0.041				
Purge (	Device		3 ft.	Bailor			(2)	0.163				
				///////////////////////////////////////			4	0.653				
							6	1.469				
174 M		In the second second	St. 1 4121	R. H. L. T. L.	FI	ELD PARAN	ETERS		" The second second	San Barrisser		
Tim	10	Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	Other DTBA!	Calar / Odar / Commo		
		(gals)	°C	mS/cm	mg/L	SU	mV	NTU	Other. <u>VIAV</u>	Cului / Odor / Comme		
Stat	bilizati	on Criteria	constant	± 3%	± 10%	± 0.1	±10 mv	<10	he and the second of			
	01	24.10		sem	13.00	2.0		> 000				
101	: 00	97.00	1.45	0.5 00	-12-12	1.8	Dal 2	1000	199.12			
				I								
										•		
Observa	ations/	Notes:	Pur	e Start Time:	10.0	5	1	Purce Rate:	2.7500	1/2min		
YSI S/N	N _	C-103	20.		<u> </u>		-		Paul	2502 and a lal		
		Pmbe GUOX	M.O						Ly	ριοχιπάτα		
		1.										

Development stopped after 14 hours of surging + bailing per Etic Epple + Morgan Bhino - At the end - turbidity still too high

WELL DEVELOPMENT DATA SHEET         UNIT OF Conjevite         Project Number: 678980.09 F/W         Well Development       Sample D: NA         Date:       I/Alt         Weather:       USS of Conjevite         Event:       Well Development         Date:       I/Alt         Date:       I/Alt         Date:       I/Alt         Date:       I/Alt         Depth to water:       I/Alt         Before       Att       F1.(BTOC)         Well Development       Sampling Team:       Mellanite. Dick (ISG)         Well Notwer:       I/Alt       Sampling Team:       Mellanite. Dick (ISG)         Well Development       I/Alt       Sampling Team:       Mellanite. Dick (ISG)         Well Volume:       3.24       GAL       Well Dia       Volume         If all Purge Vol.       Team       Cond       Dol       Sampling Team:       Sampling Team:         Number:       Statistics       Sampling Team:       Well Dia       Volume       Sampling Team:         If all Purge Vol.       Team       Cold I/Dia       Mellanite. Dick (ISG)       Sampling Team:       Sampling Team:       Sampling Team:         Statistics		¢c	H2MH	IILL							
The Exception of the construction of the co		THE WEEK P			1.5	WELL DE			<b>T</b>	14 21 20 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Location: $\underbrace{Vel Devolve}_{Vel Devolve}$ Event: $\underbrace{Vel Devolve}_{Vel Devolve}$ Weather: $\underbrace{Vel Qel CP}_{Vel Qel Peroperov}$ Weather: $\underbrace{Vel Qel Perov}_{Vel Qel Perov}$ $\underbrace{Vel Devolve}_{Vel Qel Perov}$ $\underbrace{Vel Dovlve}_{Vel Qel Perov}$ $\underbrace{Vel Dovlve}_{Vel Qel Qel Perov}$ $\underbrace{Vel Devolve}_{Vel Qel Perov}$ $\underbrace{Vel Devolve}_{Vel Qel Perov}$ $\underbrace{Vel Dovlve}_{Vel Qel Perov}$ $\underbrace{Vel Dovlve}_{Vel Qel Perov}$ $\underbrace{Vel Dovlve}_{Vel Qel Qel Perov}$ $\underbrace{Vel Dovlve}_{Vel Qel Qel Perov}$ $\underbrace{Vel Dovlve}_{Vel Qel Qel Perov}$ $\underbrace{Vel Dovlve}_{Vel Qel Qel Perov}$ $\underbrace{Vel Devolve}_{Vel Qel Qel Qel Qel Qel Qel Qel Qel Qel Q$		Client:	NAVFAC		1	Proi	ect Number:	679580 09 F	WI 2124	( 14	and the second second second
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		Location:	<b>OLF</b> Coupeville	8			Well ID:	WI-CV-MWC	DHS		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		Event:	Well Developm	nent			Sample ID:	NA			
Weather: $45 \circ \ell$ , MOSHIN Closed Before After Depth to water: $112 \cdot 3$ , Tr.(BTOC) Weather: $12 \cdot 3$ , $112 \cdot 3$ , Fr.(BTOC) Weather: $12 \cdot 3$ , $112 \cdot 3$ , Fr.(BTOC) Weather: $12 \cdot 3$ , $112 \cdot 3$ , Fr.(BTOC) Weather: $12 \cdot 3$ , $112 \cdot 3$ , Fr.(BTOC) Weather: $12 \cdot 3$ , $112 \cdot 3$ , Fr.(BTOC) Weather: $12 \cdot 3$ , $112 \cdot 3$ , Fr.(BTOC) Weather: $12 \cdot 3$ , $112 \cdot 3$ , Fr.(BTOC) Weather: $12 \cdot 3$ , $112 \cdot 3$ , $11$		Date:	1/26/17	-		Samj	pling Team:	Melani	P. DICKISO	2	
Before AfterTotal Depth:U GL : GL: U GL : GL:Measuring Device: $YSTColspan="2">Colspan="2">CULD DUGU M METCEWell Volume:Well Volume:Total Purge Vol:GALFT:GALMeasuring Device:YSTWell Volume:Total Purge Vol:GALFT:GALMeasuring Device:YSTPurge Device:SFT BOILOCHMeasuring Device:YSTTime(model)CounterTime(model)Measuring Device:YSTTime(model)ClumeMeasuring Device:YSTTotal Purge Vol:GALFT:Time(model)TUIDDUGU M METCEPurge Device:SFT BOILOCHMeasuring Device:YSTTime(model)GALFT:Time(model)TimeGALFT:(Model)Time(Model)TimePurge VolTemp.Measuring Device:YSTTime(Model)Mathematical MeasurementOtherMathematical MeasurementTime(Colsp$		Weather:	450F A	105ty	Cloudy		-				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	3:35 D:45	Total Depth: Depth to wate Water Colume: Total Purge V Purge Device Time	er: (·) n: (x) /ol.:	Before 12.2 92.3 19.9 0.163 3.24 32.40 ft Bail ft Bail Temp. °C constant	(oll aly After 112-3 92.8 19.5 19.5 et + Me cond. ms/cm ± 3%	FT.(BTOC) FT.(BTOC) FT. GAL/FT. GAL. GAL. GAL. GAL. FIL DO mg/L ± 10%	5000 ELD PARAM pH SU ± 0.1	Me Well Dia. (inches) 1 1.25 (2) 4 6 ETERS ORP mV ± 10 mv	volume (gallons/foot) 0.041 0.064 0.163 0.653 1.469 Turbidity NTU <10	YST TUNDIDUH SSER-F FOR Other: DTW	y Meter Uld log specs. Color/Odor/Comments Staft Surging Stop Surging
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		0:50	2.5						291		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	WHCh	9.40	5.95	11.2	1 484	612	9 02	671	Q 12	00.0	star- pumpile
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	10	वःपक्र	la lat	10,69	1426	5 710	8 0	124	D.13	061	some arowable
9:56       8.48       11.23       0.482       3.84       9.02 $2.3$ $5.32$ $97.45$ 10:00       9.40       11.23       0.482 $3.34$ $9.02$ $-4.1$ $4.24$ $97.50$ 10:05       10.55       11.52       0.486 $2.79$ $8.62$ $3.14$ $97.45$ 10:10       11.470       11.67 $0.486$ $2.79$ $8.62$ $20.04$ $2.746$ $47.45$ 10:13       13.39       11.60 $0.493$ $2.29$ $8.02$ $-19.7$ $3.01$ $97.45$ 10:16       13.08       11.62 $0.493$ $2.00$ $8.02$ $-19.7$ $3.01$ $97.45$ 10:16       13.08       11.62 $0.493$ $2.00$ $8.02$ $-17.5$ $2.91$ $0.7.45$ 10:16 $-3.01$ $97.45$ $-6.090$ $0.02$ $-17.5$ $2.91$ $0.7.45$ 00bservations/Notes:       Purge Start Time: $9.30$ $-17.5$ $2.91$ $0.5$ $0.7.795$ $5.600$ YSI S/N       14F101028       = $0.133$ $9.35$ $9.02$	MUM	9:52	7.56	I.K	0.487	4.34	8.0 d	12.8		917	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		9:56	8.48	11.22	0.489	3.84	8.02	2.2	6.32	02.65	
$\frac{10:05}{10:10} = 10.55 = 11.52 = 0.486 = 2.79 = 0.02 = -12 = 3.14 = 97.56 = -10.10 = 11.40 = 11.60 = 0.485 = 2.47 = 0.02 = 20.04 = 2.76 = 97.45 = -10.10 = 12.01 = 97.45 = -10.10 = 12.01 = 97.45 = -10.10 = 0.483 = 2.00 = 0.02 = -17.5 = 2.91 = 97.45 = -10.10 = -10.10 = 0.483 = 2.00 = 8.02 = -17.5 = 2.91 = 97.45 = -10.10 = -10.10 = 0.483 = 2.00 = 8.02 = -17.5 = 2.91 = 97.45 = -10.10 = -10.10 = -10.10 = 0.483 = 2.00 = 8.02 = -17.5 = 2.91 = 97.45 = -10.10 = -10.10 = -10.10 = 0.483 = 2.00 = 8.02 = -17.5 = 2.91 = 97.45 = -10.10 = -10.10 = 0.483 = 2.00 = 8.02 = -17.5 = 2.91 = 97.45 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -10.10 = -1$		10:00	9.40	11.23	0.499	3.34	9.0a	-41	4 24	97.50	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		10:05	10.65	11.52	0.486	2.79	6.02	-12	3.4	97.50	
$\frac{10:13}{13.28} 11.63 0.433 2.28 3.02 - 19.9 3.01 97.45}{10:16} = 0.433 2.00 8.02 - 17.5 2.91 97.45} = 0 evelopment 10:16$		10:10	11.70	11.67	0.485	2.47	8.62	-20.04	2.76	97.45	
$\frac{10:10}{13.08} 11.62 0.483 2.08 8.02 - 17.5 2.91 97.45}{10:10} - Development$		10:13	12.39	11.65	0.483	2.28	8.07	-19.9	3.01	97.45	
$\frac{10:10}{2} \qquad		10:10	13.08	11.62	0.483	<u></u>	BUZ	-17.5	2.9	97.45	
Complete.         Observations/Notes:       Purge Start Time: $q:30$ Purge Rate: $0.5$ Liter/35 seconds         VSI S/N       14F101028       = $0.13a gal/35 sec.$ = $0.13a gal/35 sec.$ C-103100       = $0.33 gal/min$ Signature(s):       Signature(s):		10:16									Development
Observations/Notes:       Purge Start Time: $9:30$ Purge Rate: $0.5$ Liter/ $35$ seconds         YSI S/N       14F101028       = $0.133$ gal/ $35$ sec.       = $0.133$ gal/ $35$ sec.         C-103100       = $0.33$ gal/min         Signature(s):       Signature(s):											complete.
$\frac{1}{\text{Observations/Notes:}} = 0.5 \text{ Liter/35 seconds}$ $\frac{1}{\text{VSI S/N}} = 0.132 \text{ gal/35 sec.}$ $= 0.132 \text{ gal/35 sec.}$ $= 0.23 \text{ gal/min}$ Signature(s):											
Observations/Notes:       Purge Start Time: $9:30$ Purge Rate: $0.5$ Liter/ $35$ seconds         YSI S/N       14F101028       = $0.13agal/35$ sec.       = $0.13agal/35$ sec. $C-1031a0$ = $0.33gal/min$ Signature(s):       Signature(s):											
$\frac{C - 103120}{0.132} = 0.132921/35sec.$ $= 0.23921/min$ Signature(s):		Observations/ YSI S/N	Notes: 4F10102	Purg	e Start Time:	9:31	7		Purge Rate:	0.5 (17	er/35 seconds
= 0.23gal/min			<u>C-1031</u>	30						= 6.13	agal/35sec.
Signature(s):										= 0.23	sgal/min
		Cianah(-)									
	l	oignature(s):									

MWOJ-M Re-do-water-taken out-previously from 3-ft bailer (5 hours)

5ft baller used Initially. ~0.5gal/bail

Client:	NAVEAC			WELL DE	VELOPMENT	DATA SHE	ET	AIM .				
Location:	OLE Coupouil			Proj	ect Number:	6/9580.09.F	1.WI					
Location:	Well Develope	9			Well ID:	WI-CV-MW	OJ-MS_					
Event. Dato:	Veil Developt	nent		Sample IU: NA								
Vale: Weether:		0 (L-1.1 (		Sampling really MELLULIC, DIGGOVI								
weather:	-40°F,4	rutiy c	way.						<u> </u>			
Total Depth:	_	Before	After   []2.00	FT.(BTOC)		M	easuring Device:	YSE				
Depth to wat	er: (•)	92.20	94.9	FT.(BTOC)			Ū	Turbia	lity Meter			
Water Colum	in:	19.80		FT.		-		1 see	-freldbook for			
Noll Volumo	. <u>(x</u>	0.163		GAL/FT.		Well Dia.	Volume		Pecker offices)			
weil volume		3 23		GAL.		(inches)	(gallons/foot)	0	perturing			
i otal Purge	voi.:	32.30	L	GAL.		<u> </u>	0.041					
						1.25	0.064					
Purge Device	s: <u>5</u>	oft Bau	ler			Ð	0.163					
	_	Istaine	SS SHEL	)		4	0.653					
						6	1.469					
Diff. and the				F	ELD PARAM	ETERS		and the	·····································			
Time	Purge Vol.	Temp.	Cond.	DO	ρΗ	ORP	Turbidity					
Ime	(gals)	°C	mS/cm	ma/l	SU	mV	NTU	Other:	Color / Odor / Comments			
Stabilizat	ion Criteria	constant	± 3%	± 10%	±0.1	± 10 mv	<10	of the state of th				
11:32									- SHIP SILVAUA D			
11 65	~2						121000	-	- JIMIT OW MUMAN			
12:05	10											
12:12	12											
12:22	1 2											
12.25	+ 0						71,000					
10.00	+ 0						121,000					
12 10	11						71,000					
12.00		11 202	A 1117	6 01	1 1	0.0	201					
13:12	11.	11. 22	5.412	<u>- 7 · 71</u>	<u>+. + d</u>	aU_	43					
- 3:10		<u> 11.27</u>	12 325	6.05	5.20	91.6	357					
12.95		4.17	0.341	6.03	8.18	-31	122					
-13.93		1.07	0.245	11.1.0	8,75	6.3	397	<u>*</u>				
13 23	17	10.47	0.330	13.3	8.20	-40	104					
13:30	20	1.3	0.34	12.57	8-27		106					
13:42	<u>al</u>	11.11	0.254	12.86	8.2	60	93.5					
13 49	22	1.09	V.219	13.20	8.17	41	114					
13:54	23	11.00	0.379	13.50	8.13	19	128					
13:57	24	11.05	0.360	13.40	8.13	(2.1	122					
Observations/	Notes:	Purg	e Start Time:	11:30		T	Purge Rate:	1 001	14min			
/SIS/N _	<u> 103 - 103</u>	Idu -	•				•					
	600XL	M-O						a	ppexamately			
							1	10Cs -	0.00ppm			
Namely (1)												
signature(s):	rell	10-10	<u>n</u>									
	/	I										
	CEL	loand										
Barl	er un	IUNY										
	15	INCL AL	amo Lor	•								
	C-1		maru									
	Internet	20 K	ad									
		マレッショ	MM. I									

Client:	NAVEAC		State Street	WELL DE	VELOPMEN I ect Number:	679580.09 E	ET IWI andi	4lm	
ocation:	OLF Coupevil	e			Well ID:	WI-CV-MW(	72-14 5		
Event:	Well Develop	ment			Sample ID:	NA	100 4-1 12		
Date:	1/10/1=		chard.	Samj	pling Team:	Melan	le Dick	ISON	
Neather:	_40°F	party	aonai	\$					
Cotol Dooth	1	Before	After	FT (PT00)				VCT	
Depth to wa	ter: $\frac{1}{6}$	12.00	12.00 al 9	FT.(BTOC)		Me	easuring Device:	YSL TURING	141 1 10101-
Vater Colun	<u>ות</u> וווו:	19.80	99.1	FT.				TUBIL	Crouch and
	(x	10.163		GAL/FT.		Well Dia.	Volume	1 LSEE	Henney
Vell Volume		3.23		GAL.		(inches)	(gailons/foot)	J DOOK	TUI The ACT CONTRACT
otal Purge	Vol.:	32.30		GAL.		1	0.041	] 9	
Jurne Deule	-1	CL ROL	Jar			1.25	0.064		
rurge Devic	e:	AT DU	114				0.163	4	
		stain	1255 848	el)		- 4	1 469	-	
			4	FI		ETERS	1.405	Part of Real	
Time	Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	Other: DTAL	Color / Odor / Comments
Stabiliza	(gals)	<u>°C</u>	mS/cm	mg/L	SU	mV	<u>NTU</u>		Color / Odor / Comments
		Constant	± 3%	± 10%	±0.1	± 10 mv	<10		
14:06	210	11.00	0 2510	12 01	8:12	-7	440		
14.10	27	11.00	0.240	12.30	8.12	-40	142		
4:14	28	11.10	0.303	12.70	9.13	-5	108		
14:17	29	10.97	0.364	13.10	8.07	38	137		
14:20	30	10.93	0268	13.20	812	22	240		
19.24	31	11.02	0.368	13.36	8.07	20.6	<u>aàa</u>		
14.27	1 50	10 92	0.305	13.10	8.01	33.6	150		
14.31	202	10.90	0 510	13,50	0.14	3(0.3)	96.5		
	26	10.79	0.072	12 23	<u>5.04</u>	55.0	0.5/		
14:45	30	10.95	0.404	1200	215	12 2	860		
4:44	37	10.82	0,400	12.20	9.14	18.4	(13,4		
14:53	39_	10.74	0.413	13.55	8-10	-6.7	80.4		
14:55	39	10.89	0.425	13.32	9.03	33,5	(02.3		
15:00	90	10.97	0.425	12.20	9.01	25.9	96.6	94.15	
15:00		10.09	U.Ha	Wide	7.89	82	51+	42.15	
)bservations	/Notes:	Pura	e Start Time	-w.10	<u></u>	12 12	Purgo Poto:	1001/0	1444
'SI S/N	C-1031	ວດ 🛄	o otart milo.		<u></u>		Fuige Nate.	-1941/3	
_	Prober	todel:						appi	W.
	LOOXL	<u>M-0</u>							
lanaturala):	-111-								
Nyliature(s).		$\sim$ $ \alpha$	$\sim$						
	,								
	7 15 11			_					
DIM=1	2.10-71	a anati	1 haba	ilc					
Hart n	reasurir	M EVER	r w isso	U)		~			
1.	hailen	, 2 noli	lons ~	1 well	volum	l			
Q	י כיואט	- o yun							
* At	this tim	e more	surina	technic	rue/cor	Hainer	is chan	aed.	
•				C. C.MA		vic do		-0···	
	- some	UNUTL	vurye:	D TIVIN	provid	wo wu	n refer4	-71	
	~ ^ / ` ~ *	_							

	017	MANEAO	6、台口2位中		WELL DE	VELOPMEN	T DATA SHE		-Alta				
	Client:		ille		Proj	ect Number:	679580.09.F						
	Event:	Well Develop	ment		•	Sample ID: NA							
I	Date:	1/16/1	F		Sam	pling Team:	Melanie Dirkism						
1	Weather:	40°F,	Partly	Cloud	6								
	Total Depth: Depth to wat	er: <u>(</u>	Before 112.00	After 112.00 94.9	FT.(BTOC) FT.(BTOC)		Mo	easuring Device:	YST TURBIC	lity mete			
			<u>14.00</u>	<u> </u>	GAL/FT.		Well Dia.	Volume	See-	field log			
1	<b>Well Volume</b>	:	3.23		GAL.		(inches)	(gallons/foot)	600	K tor			
	Total Purge '	Vol.:	32.30		GAL.		1	0.041	spe	anoun			
			- AL				1.25	0.064					
I	Purge Devic	e:	3 tf 50	uur				0.163					
							4	0.653					
Г		and an and the	1.1. C					1.409	The second s				
ŀ		Purge Vol.	Temp.	Cond	DO	nH	ORP	Turbidity		terre de la companya			
	Time	(gals)	°C	mS/cm	ma/l	SU	mV	NTU	Other: DTW	Color / Odor / Comme			
	Stabilizat	ion Criteria	constant	± 3%	± 10%	± 0.1	± 10 mv	<10	No.	" superior and the			
ŀ	15:50	49	11.01	0.446	10.44	7.98	170	200					
┢	15:50	52	11.17	0.450	9.40	8.2	144	129					
ŀ	210.12	22	1.04	0.400	10 03	9 ld	100	362					
	110:24									Istart surgu			
ſ	110:38	58	10-15	0.452	10.20	815	190	621		PRINTERIO			
T	08:07									Stad-SILMIN			
Ί	08:17									STOD SULICIN			
$\left  \right $	<u>178:00</u>		11.01	0.397	14.77	7.35	405	380					
┢	08:01	64	11.00	0,345	12.99	8.14	320	56.4	94.9				
7	00:35									complete			
F													
ľ													
ŀ													
┝													
	Cheanvations	Notes:	 	o Start Time:	11:00	1/1-1=							
K	/SIS/N	C-1.67	3120 ""	e otart rime.	11.30	<u> 1/ 10/1-</u>	<i>t</i>	Purge Rate:	<u> </u>	MIN			
		Probe	togol:		00:20	1/17/1	7		ap	PDXIIIICHU			
		LOO V	LM-n		•••••	.,,.	•		-41				
		-	<u> </u>										
E	Signature(s):	Mela	s p	<u>si</u>		_							
- \	NOIL CO	moute	, after	a+hr	surs r	of tou	NIADM	n L					
1				በ ተገኘ የ	vu v		WHIN W	405					



Use 3ft bailer. 5ft bailer goes down out the way to about 5feet above the bottom.

M 163.5 193.7

1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	- 1 2 m			WELL DEV	ELOPMEN	T DATA SHE	ET				
lient:	NAVFAC		_	Proje	ct Number	: 679580.09.F	1.WI				
ocation:	OLF Coupeville	)			Well ID	: WI-CV-MW	3-D				
event:	Well Developm	ent			Sample ID	: NA		1.1.1			
)ate:	1/29/17	r -		Samp	ling Team:	Melan	le Dicki	son			
Veather:	400F, WI	ndy, M	ostlycl	oudy							
		Refere	Attor								
otal Denth		22 -	121	FT (BTOC)		M	easuring Device	YST			
enth to wat	er. (-)	142 0	11141	FT.(BTOC)			suburning berrioe.	TurdaMa	the paptelo		
Vater Colum	n: <u>17</u>	92.5	02 9	FT.				Interne	Cup 1100		
	(x)	0.11.3	-10.1	GAL/FT.		Well Dia.	Volume	1 Coll	theoring		
Vell Volume		15.12		GAL.		(inches)	(gallons/foot)	6	ooktop spen		
otal Purge	/ol.:	151.2		GAL.		1	0.041				
		10.00				1.25	0.064				
urge Device	. N	legamo	nsoon	pump		(2)	0.163				
	Dir	20 + choi	KININO	cilcium		4	0.653				
	Pil	n's ones	- Winc	- sulstruct		6	1.469				
	anue - att	1. 18	201 1027	FIE	LD PARAN	ETERS		A TENSION	19 世纪的		
Time	Purge Vol.	Temp.	Cond.	DO	pH	ORP	Turbidity	OH- DTAI	0.1		
Time	(gals)	°C	mS/cm	mg/L	SU	mV	NTU	Other: DIVV	Color / Odor / Comment		
Stabilizati	on Criteria	constant	±3%	± 10%	±0.1	± 10 mv	<10	1 - B Dates	A ST ALLENNE		
10:55	26.89		-				71,000	161.7			
11:05	27.54	-					71,000	161.6			
11:15	28.19	-					71,000	160.5			
1:30	28.84						21,000	165.2			
11.50	29.99	-					799	165.			
10.20	14								pumpstopp		
16:00	25						000	-	Begn bailind		
110:07	Un						980	TEG(MD)			
10:09	uc						71,000				
10:12	ED I						21,000				
10-16	55	-					21000				
16:22	60	-					21 000				
16:28	65						942				
10:34	270	)					540				
08:40							0.10		SIATOR		
08:51	+30=100						71,000	-	SMUL		
09:03	+8=108						21,000				
DServations/I	Votes:	Purge	e Start Time:	10:20	A	S	Purge Rate:				
	TFICIDA	0									
	C-103120	2									
10.4		The second									
Turbid	UTY: CIOZ	267						0.5L			
	0 100							0010			
								1 minu			
gnature(s):	11000	EA	~		_						
N/	mar	-pi	~								
	/		0.65				2.1				
			0.00								
								Time to r	echarge		
								at 11	HIN allout		
									2 and a product		
									1-omin.		
	1.00							3			
ump d	pond d	NOKKIN	a.								
with of	Thank	CC.	J	10		1					
ned i	ising di	tevent	-techn	Ique +	- pull	d app	TOX 40 0	allonsour	4		
									-		

NAVFAC OLF Coupeville			WELL DEVELOPMENT DATA SHEET           Project Number:         679580.09.FI.WI           Well ID:         WI-CV-MW () 3 – ()								
Well Developme	nt 105114 Cl	ondy	Sa Samplin	mple ID: NA g Team: <u>IV</u>	e ID: NA eam: MULANU DICKISIM						
ter: (-)	Before 237 143.8	After 237- FT 144-1 FT	Г.(ВТОС) Г.(ВТОС)		Meas	suring Device:	VSI Turbidute	1 meter			
nn: (X) Xol.:	93.2	<u>43.7</u> G G	AL/FT. AL.	F	Well Dia. (inches) 1	Volume (gallons/foot) 0.041					
ie: <u>M</u>	anual 5.97	Lift PU	ump+_		1.25 (2) 4	0.064 0.163 0.653					
AND DESCRIPTION		porter	FIE	DDADAME	6	1.469		A STATE OF A			
Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Commer			
tion Criteria +1 = 109 +C = 114	constant	± 3%	± 10%	± 0.1	± 10 mv	<10 >1,000					
1 130	11.07	0.367	9.40	7.11	51.0	447					
5 1-165	11.18	0.363	9.42	7.34	-45	232	144.1	Donetrom			
14F101(	Pur Pur	rge Start Time	8:1	10	-	Purge	Rate:				
<u>C-1031</u>	20					950 P	uned 1/30				
	$\begin{array}{c} \text{OLF Coupeville} \\ \hline \text{OLF Coupeville} \\ \hline \text{Well Developme} \\ \hline \textbf{UG0/17} \\ \hline \textbf{UG0/17} \\ \hline \textbf{UG0/17} \\ \hline \textbf{Vol.:} \hline \textbf{Vol.:} \\ \hline \textbf{Vol.:} \hline$	NUTAC         OLF Coupeville         Well Development $V30/17$ $45°F, MPSTM U$ Before $237$ ter:       () 1 U3.0         nn:       93.2         e:       ()         Vol.:       ()         e:       MOMUAL         State       5.4         Purge Vol.       Temp.         (gals)       °C         tion Criteria       constant $H = 109$ $H$ $H = 100$	NUT RC         OLF Coupeville         Well Development       U30/17 $45^{\circ}$ F, MIPSTly CLOUDY       Before       After $45^{\circ}$ F, MIPSTly CLOUDY       Before       After $37^{\circ}$ $337^{\circ}$ $237^{\circ}$ F         ter: $(1)$ $143.0$ $1444.1$ $73.2$ $93.9$ $93.9$ $93.9$ $1000000000000000000000000000000000000$	Trojecti         Trojecti         Sa         Samplin         Samplin         Samplin         Sa         Samplin         Sa         Samplin         Sa         Samplin         Sa         Sa         Sa         Sa         Sa         Sa         Sa         Sa         Sa         GAL         Sa         GAL         Sa         GAL         Sa         GAL         Sa         GAL         GAL         GAL         GAL         Purge Start Time:	Toyer number of AC         The rest of the r	TUTY TO       Triget Well B: 30300301 MM         Well Development       Sample ID: NA         YGO/17       Sample ID: NA         Sample ID: NA       Sample ID: NA </td <td>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</td> <td>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</td>	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $			

* à pulls in between each data point - data taken from bail sent to middle of scheen.

	MANEAC		and a start of the second	WELL D	EVELOPMEN	T DATA SHE	ET	the share and the				
Client:	NAVFAC	illo		- Pro	bject Number	: 679580.09.1	-1.WI					
ocation:	Woll Develor	ment		Sample ID: NA								
vent:	1/202/	17		Sampling Team: MOLONDIA DICKISM								
leather:	HOOF Y	nostu (	Jundu									
otal Depth: epth to wa	ter: <u>(</u>	Before	After	FT.(BTOC) FT.(BTOC) FT.	a.	м	easuring Device:	YST TWIDIDE	by meter			
ater ooran	6	0 +163	120.0	GAL/FT.		Well Dia.	Volume	1				
ell Volume		6.28		GAL.		(inches)	(gallons/foot)					
tal Purge	Vol.:	62.0		GAL.		1	0.041	1				
			1.0.			1.25	0.064	1				
rge Devic	e:	manual	UHT DU	mpt		(2)	0.163					
		5-At 1	aller	1		4	0.653	1				
711-22-14 Day			and the second second			6	1.469	A second state of the				
1.1.1.2.	Purge Vol	Toma	Cand	F	IELD PARAM	ETERS	A LANGE		the second second second			
Time	(gale)	enip.	Cond.	00	pH	ORP	Turbidity	Other: DTW	Color / Odor / Comments			
Stabilizati	on Criteria	constant	+ 3%	mg/L	50	mV	NIU	OCLEMPSON AND				
2:30		constant	- 5 /0	110/6	± 0.1	± 10 my	<10	A LOSS AND A DECK	CHAN- MANA			
2:40	)								Shire surging			
3:05	$\sim$		-						STUD SURGINO			
3:15						-			SATIN NUMUNA			
3:34	~10						71,000		and and and and			
4:40	20						-71,000					
4:54	dd	10.73	0.28	9.11	8.03	-13	586					
Fild	24	10.62	0.271	10.42	8,00	-34	225	123.6				
C dd	20	10.59	0.270	10.05	8.09	-916	124					
3:40	20	10.00	0.27	10.95	8.04	-68	121	123.6				
6.10	32	10.05	022	10.46	2.10	-90	=71.1					
10:101	24	10.28	0.202	10.00	0.20	-115	-90B	23.10				
6:36	~37	10.5	0.284	10.104	8.18	-101	410		Well control			
$\sim$			- 20 1		0.10	101	61.0	123.5	well compl			
		-										
Dugliar II	later											
Valions/N	HEIDUN	Purge	e Start Time:	13:30	9		Purge Rate:					
	6-103120	2	~370	gal.	V	veil co	mplete 4 hours	after				

5 At bailer will go down

Olivet				WELL DE	VELOPMEN	T DATA SHE	ET		
GREAK:		<u></u>		:Pro	oject Number	r <u>679580.09.F</u>		B 212AIG	
Location:	OLF Coupevil	le		-	Well ID:	WI-CV-MW	041	<u>M</u>	
Event:	Well Develop	ment		-	Sample ID:	NA		001	
Date:		1+	/	:Sa	mpling Team		KEG WA	KKEN	
Weather:	_ UFEE	27/51-02	3ERS/4	05					
Total Depth: Depth to wat	157.)5 ter: (-)	Before 7-90- 117-9	After 158.5 1400	_FT.(BTOC) _FT.(BTOC) _FT.(BTOC)	132.4	:M	leasuring Device	<u> </u>	1 M DS, HARIT 200 G
Well Velume	<u>(x</u> )	<u></u>	1113	_GAL/FT.		Well Dia.	Volume	Sci	REEN =
Tetel Dures		N/A	19	GAL. (	3	(inclies)	(galions/loot)		
i otal Purge	Vol.:	NB	[- [-]	GAL.		1	0.041		49-159
		2/ 1		~		1.25	0.064	7	m 149
Purge Devic	e:	<u> </u>	5 BAILE	Δ,	-	2	0.163		1 = 12 1
						4	0.653		
						6	1.469		
	1			Fl	ELD PARAM	ETERS			
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP rñV	Turbidity NTU	Other VT	Color / Odor / Comments
Stabilizat	ion Criteria	constant	± 3%	± 10%	± 0.1	± 10 mv	<10	-	GENY SILT,
1105	START	BAILIS	Kr. (N	o surge	- 100 /	nuppy			
1300	BAILE	WT JA	19				-	157.	10=1585
1302	ita	RECON	2- r	RA JI	1- 000	h			100.0
1345	RESU	ME -	SILTY	GRAY				141	SILTY
1500	~1012	119	.35	91	8.65	-294	>1,200	, , ,	
ISTO	~15	170	.30	77	8.b7	-372	2130.0	177 4	
1220	~17	11.8	.35	41	875	-793	2 1000	136.1	
1534	~19	11.9	35	77	5.13	-3.05	7 1000		
1527	~20	109	35	70	871	305	71000		
1-47	20	1.00	, ~ 5		<u>0. +S</u>		311 12120		
15 70									
<u> </u>	- /	<u> </u>		/			<u> </u>		<u></u>
		<u> </u>	1	_/	N.		1		
		-			1				
- Murel			1	1	1	<u></u>	20	1	
1	1			1			\	1	
			1	1					
1					Y.,			1	
1		\	1	l		(	l	1	
Observations/	Notes:	Purg	e Start Time:	1:05			Purge Rate:	SLOW.	
YSI S/N	14F10	21028					0		
HACH:	< 1037	267		Purc	E0 / R	CHAR	500 4.5	HRS. W	ATER
	<del></del>			କ	vary o	WELL	PRODUCI	NOF SILT	BUT
				0T	HERW	ISE P.	XRAME	T. 2.5 51	BBLE.
					Ŧ	- 4 1			
	4.								
		<u> </u>							
Signature(s):		-y-y-	0						
69	$\bigcirc$	0					_		
0									

				WELL DE	VELOPMEN	T DATA SHE	ET		
Client:	NAVFAC			:Pro	oject Number	679580.09.F	I.WI		
Location:	OLF Coupevil	le		-	Well ID:	WI-CV-MW	- 04XX-	- 5	
Event:	Well Developm	nent		-	Sample ID:	NA	71		
Date:		<u>f</u>		:Sai	mpling Team	<u> </u>	g watkke	<u>: N</u>	
Weather:	<u>31 3</u>	MOM		•					
Total Denth:	10	Before #	After	ET (BTOC)		-14	lassuring Davica	YSI 65	UMDS, HACHZISON.
Depth to wat	ter (.)	108 1	109:00	FT (BTOC)		- 10	leasuring Device	S-1 MCT	tal
Water Colun	no. (-)	10011		FT				JULINS	
	(x)	12/163		GAL/FT.		Well Dia	Volume		
Well Volume	: 3	.25		GAL.		(inches)	(gallons/foot)	30	REEN = 112-122
Total Purge	<u> </u>	5		GAL.		1	0.041	¥.	. /
	_		<b>.</b>	•		1.25	0.064	n t	1.2 SMCKUP
Purge Devic	e:	BAILOO	3' 50			2	0.163	15ec	
•	_				-	4	0.653		
						6	1,469		
				FI	ELD PARAM	ETERS			
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Stabilizat	ion Criteria	constant	+ 3%	+ 10%	+0.1	+ 10 my	<10		
1350	STAR	- SUR	KING-						
1405	- STAN	LT BA	ILING						
1425	2	1014	0.17	9,8	88	-176	7 1000		RROWN
1455	~86	102	0.21	8.2	8.5	-167	31000		1
1546	DRY	- REC	WAR.					17-29	
1752	D. FE	59	125-CA	R DV	ERNICI	T. 8		109.1	
0850	10	12.8	0.32	736	2.3	53			
()920		11.0	0.35	184	6.5	3.0	>1099	123 3	LT Basingt
19415	13	10.9	035	15.5	85	43	21007		
12930	REU	DVER	~						
0945	15	11.5	0.37	12.5	8. 15	27	7000 BU	T DOGS NO	TLOOK MURDY
1000	16	115	0.38	11.7	8.4	53	800	1767	MDRY
1005	END	- J	27 , 9	POSLE					
1	3		1	i	l		Ē	· · · · · ·	
					1				
						- 1,			
Observations/	Notes:	Purg	e Start Time:	1405			Purce Rate	SLOW	·
YSI S/N	14 F 101	028				•			
nich		<u>, , , , , , , , , , , , , , , , , , , </u>							
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			Λ	(					
Signature(s)		+	$/\sim$	1-0					
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		_	0						

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*lots of bentonite gel found at bottom of well measured TD~185Ft Actual TD~197Ft

> Use 3-ft bailer.

Client:	NAVFAC			Proi	ect Number	: 679580 09 F		nia	the and a state of the
Location:	OLF Coupevill	e			Well ID	WI-CV-MW	09-W S		
Event:	Well Developr	nent			Sample ID	: <u>NA</u>			
Date:	1/21/17	<u></u>		Sam	pling Team:	melan	2 DICKIGON		
weather:	- 45 VF	sunny	<u> </u>			<u> </u>			
		Before	After						
<b>Fotal Depth:</b>	_	110.5	109	FT.(BTOC)		М	easuring Device:	YSI	
Depth to wal	ter: <u>(-)</u>	104 05	109	FT.(BTOC)			-	Turbido	ry meter
water Colum	nn:	6.45	0	FT.		141-11-01			0
Nell Volume		Lelles		GALIFT.		Well Dia.	Volume		
Total Purge 1	Vol.:			GAL.		(inches)	(gallons/foot)		
otari arge				ONL.		1 25	0.041		
Purge Devic	e:	3-ft 6	Bailer	•			0.163		
•					1	4	0.653		
						6	1.469		
		"算"		FI	ELD PARA	AETERS	and a strong when		
Time	Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	Other Drank	Color LO to LO
-01-1-11 -	(gals)	°C	mS/cm	mg/L	SU	mV			Color / Caor / Comments
Stabilizat	tion Criteria	constant	± 3%	±10%	± 0.1	± 10 mv	<10		W. Charles and the
01:15	~~~								Begin ballno
09+55	A 8						<u>&gt;1000</u>	109	well comple
									+
						<u> </u>			
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	<u>                                     </u>	<u>├──</u>							
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						<u> </u>	·		
		<u> </u>		·			<u> </u>		
		<del> </del>							
						<u> </u>			
bservations/	/Notes:	Purge	e Start Time:	091:16			Purce Rate:		
SI S/N	14F1010.	<u> አ                                   </u>				-	i algo i lato.	0.00	aal
				11 000	maint a	Le nru		0.03	
	<u> </u>	120			rupue	ie un	ter	ьа	U
			au	r sun	x/'w0	uter r	enove		
			fn	sm su	imp.	NO re	charge	into	
					- 1	11.011	0-		
Variation ( - ).	-1100		·a			wen	•		
ignature(s):	NU	$\sim$	$\frac{1}{2}$	$\mathcal{N}_{-}$					
	/	1							
-		ant lin	· Th	a 109	IFT				
	evenpm	un cu	1'	0.10					
	·		N.	schell	ned g	4-104-	F <del>T</del>		
					1	1 .			1
			A.C. 141		chaan				14.5
	٤	t NU May	for sith	Wal ur :	SUM	~			V.
	7	140 4.30		L					
	a spatter								
NWO4-N	FS								
NUKAT									
ID CR									
ייפיטון									

Oliverty				WELL DE	VELOPMEN	DATA SHE	ET		
				- :Pro	oject Number	679580.09.F	1.WI	·	
Location:	OLF Coupevil			-	Well ID:	WI-CV-MW	- 101)		
Event:	VVell Developr	nent		-	Sample ID:	NA			
Date:	21711		-	:Sa	mpling Team	<u> </u>	EG WAR	KEN	······
Weather:	90 s 5	INME CL	au 175	-					
Total Depth:		Before 191.30	After / 206	_FT.(BTOC)		:N	leasuring Device	YSI, HA	CH 2100Q,
Depth to wat	ter: <u>(-)</u>	112.8	142.62	FT.(BTOC)				SOLIN.	51
Water Colun	nn:	-	63.4	FT.				17	
	<u>(x)</u>	1 -	0.163	GAL/FT.		Well Dia.	Volume	* NOTE	K-10
Well Volume	e		0.3	GAL.		(inches)	(gallons/foot)		M BEGINNIME
Total Purge	Vol.:		55	GAL.		1	0.041	5 10	D'OR MORE DE
						1.25	0.064	TRU	Later Nub N
Purge Devic	e: <u>BA</u>	NER, M.	AN LIFE	PUMP	_	2	0.163	5714	-marman In
						4	0.653	WEL	
						6	1,469	1	
				FI	ELD PARAM	ETERS		L	
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Stabilizat	ion Criteria	constant	± 3%	± 10%	± 0.1	± 10 mv	<10		a contract of the second
190	D Sar	GE	·						
10920	BAIL	P	ULL 0	ur or	LILL M	up			
1145	MINE	315-	Sidito	1++2	PILMO	T	ant	147.67	LUL DROVAKO
1155	3/2/0				I GIME			112.02	COU PROPPED
1745	25	9 28	17.574	733	715	-00	694	155.40	IT BROWN
1700	47.	041	0.587	-T 57	7.09	<u>00</u>	211	137.00	
121	20		7 5 772	1.00	7.0		1106		
1315		942	P 3F1	221	1.10		710		CL CL P (N )
1705	50		10-5 71	216	f.15	- 40	219	147.4	CLEARING
1240	<u>₹</u> nī		,						
			<u> </u>						3
	1								
1							1		
							1		
								310	
				1					
	{								
Obcon rolling of	Mala de	Dure	L	A97	└ <u>───────────────────────</u> ───	1			
YSIS/N <u>i</u>	4 F 1010	Purg 28	e Start Time:	1112			Purge Rate:	~ 0, 5	Jpm
HARH	C 10212	0	RE	MUVER	10-	IT DI	= DRIL	L MYD.	
- No			M	A-5129R	LINK	1~ ~ ~	RELINE	BROKE	AT END.
	$\sim \lambda$	κ.							
Signature(s):	Ð	i pi	с						

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				WELL DE	VELOPMENT	DATA SHEE	T	un la	
Client:	NAVFAC			:Pro	ject Number	679580.09.F	I.WI	1011	
Location:	OLF Coupevill	e			Well ID:	WI-CV-MW	- 10HS	10M	
Event:	Well Develop	nent			Sample ID:	NA			
Date:	_2[6]	F		:Sar	npling Team	GREG	WARREN		
Weather:	SNOW ,	CharDs	1305						
Total Depth:		Before 56.0	After 56.4	FT.(BTOC)		:M	easuring Device	YST 650	MDS, HACIF
Depth to wat	er: <u>(-)</u>	136.09	13618	FT.(BTOC)				2100 9,	SOLINST WL.
Water Colum	n:	199		FT.				19 <b></b>	
	(x)	0.163	-	GAL/FT.		Well Dia.	Volume		
Well Volume	: 3	3.25	-	GAL.		(inches)	(gallons/foot)		
Total Purge	Vol.:	19		GAL.		1	0.041		
<b>.</b>		<u> </u>				1.25	0.064	1	
Purne Devic	. 3	SS BAL	ICR			2	0.163		
i uige beile	<u> </u>	55 911		3.0		4	0.103		
							0.033		
							1.469	L	1
	Dura Mal	-	Quel	FI		ODD	T. A. L. MA	r	
Time	Purge Voi. (gals)	°C	mS/cm	ng/L	SU	mV	NTU	Olher: DTW	Color / Odor / Comments
Stabilizat	ion Criteria	constant	± 3%	± 10%	± 0.1	± 10 mv	<10		
1300	STARF	SURGING				×			
1325	START	BAILI	VG -					136,15	
1415	5	CHAN	GE TO N	MULAL	LLIFT	pump			
1420 -	+1520	NO PU	RGE. D	UMP W	bNIT LIF	. WAT	ER.		
1520	BESUN	EBAIL	ING						
1540	10	950	0.549	8.4	167	-223	>1000	126.21	REDWAL
1555	~17	917	2.55	56	765	-724	H		MURKY
1610	NIS	9-11	17.56	17	710	- 270			MARTI
1670	-19	937	0.550	5.6	711	-771		1.20 18	
1620	FUD	1.16	01076	7.4	.5.00	- 656		156.10	
1075	ENU	T		1		1		1	
$\vdash$	┝-┼───		$\vdash$		$\vdash$				
$ \longrightarrow $							<u> </u>	- \	
<u> </u>	<u> </u>	<u> </u>		_\			<u> </u>	<u> </u>	
<u> </u>					<u>}</u>				
1									
	h v		•	T	T				4
Observations	Notes:	Puro	e Start Time:	1325			Purce Rate:	0.2 GP	M.
YSI S/N	14F10	1028	,			-			
HA	CH: CI	03-120	267						
		<u> </u>							
	- de								
Signature(s):		Rol	10-						
	Ċ	$\cap$							

Hent:       NAVFAC       Project Number: 679800.05.11M         vent:       'Ul Development       Sampling Team:       GUSC4.WV - 12.D         ste:       'Ul DU/L, PT. CLOWPY, US°S       Sampling Team:       GUSC4.WV - 12.D         odal Depti:       'Id S. 3 20+5'       I'R.S. FT.(BTOC)       Measuring Device:       YSEC55'(M.DS, HACH2.Lock         odal Depti:       'Id S. 3 20+5'       I'R.S. FT.(BTOC)       Measuring Device:       YSEC55'(M.DS, HACH2.Lock         odal Depti:       'Id S. 5 20+5'       I'R.S. FT.(BTOC)       Measuring Device:       YSEC55'(M.DS, HACH2.Lock         state Column:       'S13' 54-4-4''       FT.       Well Dia.       Volume:       SOLINCT       SOLINCT <td< th=""><th></th><th></th><th></th><th></th><th>WELL DE</th><th>VELOPMEN</th><th>T DATA SHE</th><th>HT Ban Page 2</th><th></th><th>Ab</th></td<>					WELL DE	VELOPMEN	T DATA SHE	HT Ban Page 2		Ab
OLF Coupevile         Weil Development           Sample ID: NA         Sample ID: NA           ste:         21 (a)[17]           ste:         21 (a)[17]           otal Depth:         198.8 2615           198.8 2615         178.5           peth to water:         55.50           otal Depth:         198.8 2615           198.8 2615         178.5           peth to water:         55.20           otal Depth:         51.15           198.8 2615         178.5           peth to water:         55.20           GALF.         Well Dia.           value Column:         57.15           str:         GALF.           fell Volume:         55.20           GAL         1.25           otal Purge Vol.         6AL.           inge Device:         BAILO2 (3'55)           Monta         AU           0.61         0.064           120         0.064           120         0.064           120         0.061           121         0.061           122.0         mscen           132         0.53           132         0.53           132<	Client:	NAVFAC			Pro	ject Number	: 679580.09.F	1.WI		and should be
Vent:       Vent       Sample ID: IA         210117       Sampling Team: $4285$ , $UAR(31)$ Venter: $1017$ , $97$ , $CLONPY$ , $46^{\circ}S$ $4285$ , $UAR(31)$ venter: $198, 320+5$ $178, 37$ $71616^{\circ}S$ venter: $198, 320+5$ $178, 37$ $71616^{\circ}S$ venter: $198, 320+5$ $178, 37$ $71616^{\circ}S$ venter: $5320+5$ $641$ $00161$ venter: $5320+5$ $641$ $00041$ venter: $5325^{\circ}S$ $641$ $10041$ venter: $532^{\circ}S^{\circ}S^{\circ}$ $641$ $10041$ verter: $311624(3'55)$ , $MN'^{\circ}MRL       20064 100041         verter:       311264(3'55), MN'^{\circ}MRL       20163 10064         verter:       31160(10, 1600) 100041 10064 10064         verter:       31160(10, 1600) 10000 110000 100041 100041         verter:       31160(10, 1600) 118000 100000 118000000 12020000000000000000000000000000000000$	ocation:	OLF Coupeville	8			Well ID	WI-CV-MW	- 12 D		
tet: $\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} $	Event:	Well Developm	ient		-	Sample ID	: NA			
leather: $\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Date:	2/10/1	7		. Sam	pling Team:	60	7- WARREN	J	
otal Depti: 198.8 2015 198.8 FT.(BTOC) Measuring Device: $\frac{1}{55} \underbrace{CSS}(NDS, HACH2uxi) SOLINGT Url TARE UP 35 FT.(BTOC) SOLINGT Url TARE UP 35 FT. FT. FT. SOLINGT Url TARE UP 35 FT. GAL. (Inches) (gallons/foot) 1 0.041 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 125 0.064 12$	Neather:	WIND	<u>1, PT. CI</u>	anby,	<u>40°S</u>					
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$\begin{array}{c c c c c c c c c c c c c c c c c c c $	lotar Deptr:	TO O	1000	-18.0			M	easuring Device:	151-6301	(V) HACHUADO
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Notos Column	1.00.00 <u>10</u>	100-75	160158					SOLINST	WLTAPE
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	valei Columi	1: 59. <u>73</u>	0 11 12				147-11-001		1	
GAL.       GAL.       (inches)       (galosafoot)         Jurge Vol:      GAL.       1.041         urge Device:       BAILED (3'SS)       M Mr/WAL       1.25         Lifer PumP.       6       1.463         Time       Purge Vol.       Temp.       Cold         Stabilization Criteria       constant       ±3%       ±10%       ×10         Stabilization Criteria       constant       ±3%       ±10%       ×10       NTU         OP13       SURGEC          Gal.          (a35)       J.5       9.7       0.48       9.2       7.4        7.1         (35)       J.5       9.7       0.48       9.2       7.9       >ueo       -       B.8.0 mH         (12.0)       PUMP       10.48       9.2       7.9       7.2       -7.1       72.0       -       7.6       7.60.73       8.6       1.400         (12.0)       2.0       J.5       0.57       7.5       7.2       -7.1       72.0       -       2.6       7.0       58.1       -       Lifer Molder         (12.0       EVD       0.57       3.6       7.3       7.0	Mall Maluman	(X)	0.163	<u> </u>	GAL/FI.		well Dia.	Volume		
GAL       1       0.041         urge Device:       BAILED (3'SS), MANUAL LIPP PUMP.       1.25       0.064 2         Time       BAILED (3'SS), MANUAL LIPP PUMP.       1.25       0.064 2         Time       Purge Vol. (gals)       Temp. Cond.       DO mS(cm       pH       ORP       Turbidity NTU       Other: OTM       Color / Odor / Comment         Stabilization Criteria       constant       ± 3%       ± 10%       ± 0.1       ± 10 mv       <10         Stabilization Criteria       constant       ± 3%       ± 10%       ± 0.1       ± 10 mv       <10         Stabilization Criteria       constant       ± 3%       ± 10%       ± 0.1       ± 10 mv       <10         OP3 S       BAILE       A H ORL       A H ORL       A HORL       A HORL       A HORL         I 20 D       Pumpe       A HORL       A HORL       A HORL       A HORL       A HORL       A HORL         I 20 D       Gal       S.5       T.2       T.4       T.2       -91       32.8       A HORL       A HORL         I 20 D       D.5       D.51       T.0       T.2       -91       32.8       I 40.2       38       RETHOLES         I 20 D       D.5       D.51	vell volume:	6-0	<u></u>		GAL,		(inches)	(gallons/foot)	!	
urge Device: $\underline{B} \square (\underline{Cl}(3'55), \underline{M} \square \underline{Lipr pump.}$ $125 \\ 2 \\ 0.163 \\ 4 \\ 0.683 \\ 6 \\ 1.469 \end{bmatrix}$ FIELD PARAMETERS         Time       Purge Vol.       Temp. Cond.       D         Sublication Criteria       Cond.       DORP       Turbidity       Other: OTH       Color / Odor / Comment         Sublication Criteria       constant ± 3%, ± 10%, ± 0.1 ± 10 mv       vitation vitatio	otal Purge V	01.:			_GAL.		1	0.041		
urge Device: $\underline{y}$ AT LEVE (\$ 557 / [PT MARL       2       0.163         LIPT PUMR       4       0.0633         6       1.469         FIELD PARAMETERS         Time       Purge Vol. (gals)       Temp. mode       Cond. mode       DO       pH       ORP       Nutbility       Other: D114       Color / Comment         Statkaster         Statkaster         021/5       Sur Rede       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       - <td></td> <td>0</td> <td>NIL AN 1</td> <td>1100</td> <td>A LOUIS</td> <td>2</td> <td>1.25</td> <td>0.064</td> <td></td> <td></td>		0	NIL AN 1	1100	A LOUIS	2	1.25	0.064		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	'urge Device:	<u>ע</u> :	MILLIL	5 771	M MI WIN		2	0.163		
FIELD PARAMETERS           Time         Purge Vol. (gals)         Temp. °C         Cond. mS/cm         DQ         PH         ORP         Turbidity         Other:         OTU-         Color / Comment           Stabilization Criteria         constant         ± 3%         ± 10%         ± 0.1         ± 10 mv         NTU         Other:         OTU-         Color / Comment           Stabilization Criteria         constant         ± 3%         ± 10%         ± 0.1         ± 10 mv         <10					LIFT PUN	n 0.	4	0.653	]	
FIELD PARAMETERS         Time       Purge Vol. (gals)       Temp. °C       Cond. ms/cm       DQ       pH       ORP       Turbidity NTU       Other: $DTL$ Color / Odor / Comment         Stabilization Criteria       constant       ±3%       ±10%       ±0.1       ±10 mv       <10							6	1.469		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $					F	IELD PARAM	IETERS	a test to the second	A DAY STATES	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Time	Purge Vol.	Temp.	Cond.	DO	рН	ORP	Turbidity	DAL	
Stabilization Criteria       constant $\pm 3\%$ $\pm 10\%$ $\pm 0.1$ $\pm 10$ m/s $\leftarrow 10$ $OP13$ SURGE $OP33$ $BH1L$ $A$ $QP10$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ $= 100\%$ <	ume	(gals)	°C	mS/cm	mo/L	SU	mV	NTU	Other: $\sqrt{1}\sqrt{4}$	Color / Odor / Comment
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Stabilizatio	on Criteria	constant	± 3%	± 10%	± 0.1	± 10 mv	<10	1 - Carroller	a section of the sect
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	0915	SURGE						-14		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	0935	RAIL	240	allons						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	inin	Rump						<u> </u>		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	125	15	99	248	97		1. 7.0	21000		22.0.1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	112.0	22	10 5	0.51	A 2	1-1-7-		77.7	<u> </u>	DRUWN
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1130	20	105	0.44	1	1-1-1	-7	1700	-	0
$\frac{1220}{1220} = N0$ $\frac{1220}$	12.10	40	104	0.51	71	TIL.		77.8	160.58	NETHALLAE
bservations/Notes: Purge Start Time: 0935 Purge Rate: 0:35 g.pm Purge Rate: 0:35 g.pm Purge Start Time: 0935 Purge Rate: 0:35 g.pm	1770	57/12	194	0.01	2.0	43	- 70	28		LT GROW-
bservations/Notes: Purge Start Time: 0935 Purge Rate: 0:35 g.pm Purge Rate: 0:35 g.pm Purge Start Time: 0935 Purge Rate: 0:35 g.pm		EIVV				<u> </u>		<u> </u>		
bservations/Notes: Purge Start Time: 0935 Purge Rate: 0:35 gpm 										
bservations/Notes: Purge Start Time: 0935 Purge Rate: 0:35 g.pm =						<u> </u>	<b> </b>			
bservations/Notes: Purge Start Time: 0935 Purge Rate: 0:35 gpm SI S/N Purge Start Time: 0935 Purge Rate: 0:35 gpm Purge Rate: 0:35 gpm Purge Rate: 0:35 gpm				<u> </u>	<u> </u>	<u> </u>	<u> </u>			
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bservations/Notes: Purge Start Time: 0935 Purge Rate: 0:35 gpm SI S/N PURGED 6 VOLUMES, PARAMETORS STABLE GODD WELL.										
bservations/Notes: Purge Start Time: 0935 Purge Rate: 0:35 gpm SI S/N PURGED 6 VOLUMES, PARAMETORS STABLE GODD WELL.										
bservations/Notes: Purge Start Time: 0935 Purge Rate: 0:35 gpm SI S/N PURGED 6 VOLUMES, PARAMETORS STABLE GODD WELL.										
bservations/Notes: Purge Start Time: 0935 Purge Rate: 0:35 gpm SI S/N PURGED 6 VOLUMES, PARAMETORS STABLE GODD WELL.										
Biservations/Notes: Purge Start Time: 0935 Purge Rate: 0:35 gpm SI S/N PURGED 6 VOLUMES, PARAMETERS STABLE GODD WELL.										
PURGED 6 VOLUMES, PARAMETERS STABLE GOOD WELL.	bservations/N	lotes:	Purg	e Start Time	0935			Purge Rate:	0:35	R 12m
PURGED 6 VOLUMES, PARAMETERS STABLE GOOD WELL.	SIS/N						-	<b>J</b>		)5
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Good WELL.					Pul	LED	6 VOLU	IMES. PI	ARAMETI	SUS STATULE
GOOD WELL.									,	
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$\frac{10/17}{10/17}$ $\frac{10/17}{000}$ $\frac{1000}{1000}$ $\frac{1000}{1000}$ $\frac{1000}{1000}$ $\frac{1000}{1000}$ $\frac{1000}{1000}$	After 100-7	- Sam - _FT.(BTOC)	Sample ID: pling Team:	NA GRE	GWARP	EIV	
10/17 -2407 BRI -06.4 M 	After	Sam - _FT.(BTOC)	pling Team:	<u> </u>	G WARP	EI	
06.4 m 106.4 m 106.4 m 106.4 m 10.1072.85 2.55	After   100-7	- _FT.(BTOC)					
Before 106.4 % (-) 1032.85 2-55 (x)	After 106-7	FT.(BTOC)					
(x) + + + 55	7	FT.(BTOC)		Me	asuring Device:	YSI/HA	ch, SOLINST.
		FT.			Maluma	1	
MUCT L		GAUFT.		well Dia.	volume	KUARY	LITTELLARY
0.92	<u> </u>	GAL.		(Inches)	(gallons/foot)	1.0-1-1	
	<u> </u>	GAL.		1	0.041	25	IN WELL.
71 55 E	SAILED			1.25	0.064	Th	
2 72 6		•		2	0.163		O BAIL
				4	0.653	l ''	
				6	1.469		
		FI	ELD PARAM	ETERS	N. D. Land	一个 正式的	
oi. Temp.	Cond.	DO	pН	ORP	Turbidity	Other:	Color / Odor / Commonly
0°C	mS/cm	ma/L	SU	mV	NTU		Color / Cuor / Comments
a constant	± 3%	± 10%	± 0.1	± 10 mv	<10	and said for	
MAT BAIL	IM						
10 +	0.57	4.3	8.09	18.5	7/200	<21 UMTER	BAILER NOTE
COVER						105.3	MOSTLY DRY
10.21	0.37	<u>T.2</u>	8.2	40.2	$[\mathcal{F}]_{\mathcal{I}}$	105.2	
10.2	_37	6.8	82	37	Spe	ORY.	
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Pur	ge Start Time:				Purce Rate:	VETHY CT.	
	_	-				(	
	$3^{\prime\prime}$ 55 E	Z" SS BAILER Vol. Temp. Cond. °C mS/cm ta constant ±3% H25 BAILINE 107 0.37 107 0.37 10.2 .37 10.2 .37 0.41 0.37 10.2 .37 Purge Start Time:	FI         Vol.       Temp.       Cond.       DO         °C       mS/cm       mg/L         ta       constant       ± 3%       ± 10%         W27       BA-1L/10%       FI         IO       P       7.3       7.3         TOVER       IO       FI         IO       P       3.7       7.3         TOVER       I         IO       P       3.7       7.3         TOVER       I       I         IO       P       3.7       7.3         TOVER       I         IO       P       3.7       6.8       9         IO       IO       IO       IO       IO       IO       IO         IO       IO       IO       IO       IO       IO       IO       IO         IO       IO       IO       IO       IO       IO       IO       IO       IO       IO       IO       IO       IO       IO       IO       IO       IO       IO       IO <thio< th="">       IO       IO</thio<>	<u>Z' SS BAILER.</u> <u>FIELD PARAM</u> <u>Vol. Temp. Cond. DO pH</u> <u>s) °C mS/cm mg/L SU</u> <u>ta constant ± 3% ± 10% ± 0.1</u> <u>H25 BAILLINE</u> <u>10 7 0.37 7.3 8.09</u> <u>TONER</u> <u>10.2 .37 6.8 8 22</u> <u>10.2 .37 6.8 8 22</u> <u>10.2 .37 6.8 8 22</u> <u>10.2 .37 6.8 8 22</u> <u>10.2 .37 6.8 8 22</u> <u>10.4 0.37 7.2 8.2</u> <u>10.4 0.37 7.2 8.2</u> <u>10.4 0.37 7.2 8.2</u> <u>10.2 .37 6.8 8 22</u> <u>10.2 .37 6.8 8 22</u> <u>10.2 .37 6.8 8 22</u> <u>10.2 .37 6.8 8 22</u> <u>10.4 0.37 7.2 8.2</u> <u>10.4 0.37 7.2 8.2</u> <u>10.4 0.37 7.2 8.2</u> <u>10.4 0.37 7.3 8.09</u> <u>10.4 0.37 7.3 8.09</u> <u>10.4 0.37 7.3 8.09</u> <u>10.4 0.37 7.2 8.2</u> <u>10.4 0.37 7.2 8.2</u> <u>10.4 0.37 7.2 8.2</u> <u>10.4 0.37 7.2 8.2</u> <u>10.4 0.37 7.3 8.09</u> <u>10.4 0.37 7.3 8.09</u> <u>10.4 0.37 7.3 8.09</u> <u>10.4 0.37 7.2 8.2</u> <u>10.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 </u>	$\frac{3^{\prime\prime} SS BAILER}{2}$ $\frac{1.25}{2}$ $\frac{4}{6}$ FIELD PARAMETERS Vol. Temp. Cond. DO pH ORP SC mS/cm mq/L SU mV Ta constant $\pm 3\% \pm 10\% \pm 0.1 \pm 10 \text{ mv}$ $\frac{10 7}{12} O 37 7.3 8.09 18.5$ $\frac{10 7}{12.2} O 37 7.3 8.09 18.5$ $\frac{10 21}{12.2} O 37 7 7.3 7 0.5 8 7 2 37 7 0.5 8$ $\frac{10 2}{12.2} O 37 7 7.3 7 0.5 8 7 2 37 7 0.5 8$ $\frac{10 2}{12.2} O 37 7 7 0.5 8 7 2 37 7 0.5 8 7 2 37 7 0.5 8 7 2 37 7 0.5 8 7 2 37 7 0.5 8 7 2 37 7 0.5 8 7 2 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7$	$ \frac{3'' 55 \text{ BAILER}}{2} $ $ \frac{1.25}{2} \frac{0.064}{2} \frac{2}{0.163} \frac{4}{4} \frac{0.653}{6} \frac{6}{1.469} \frac{1.469}{6} \frac{1.46}{6} \frac{1.46}$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$

	公理性的意识是			WELL DE	VELOPMEN	DATA SHE	ET		
Client:	NAVFAC			Proj	ect Number:	679580.09.F			02/24/H
Location:	OLF Coupevill	e			Well ID:	WI-CV-MW	of (MD) h	<u>11-CV-MW</u>	13-2M
Event:	vveil Developn	nent	10 700		Sample ID:	NA			
Weather:	140°F	Sun	y it was	Sam	pling leam:	rielar	UL DICK	son	
Total Depth: Depth to was Water Colum	ter: (·)	Before 182.01	After 1978	FT.(BTOC) FT.(BTOC)		Mo	easuring Device:	<u>YST</u> Turbid	ity Meter
	W.W.Swi	0, 022	103	GAL/FT.		Well Dia.	Volume	1	1
Well Volume		8 22	9.910	GAL.		(inches)	(gallons/foot)		
Total Purge	Vol.:	26.2	98.10	GAL.		1	0.041		
Ŭ		<u> </u>				1.25	0.064		
Purge Devic	e: N	anual	-Uft	Ump		(2)	0.163		
-		+24-	hailar			4	0.653		
		·	ound			6	1.469		
	al states a sinte		5 - C - C - C - C - C - C - C - C - C -	FI	ELD PARAM	ETERS			
Timo	Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	an mal	
time	(gals)	°C	mS/cm	mq/L	SU	mV	NTU	Other: 121 VV	Color / Odor / Comme
Stabilizat	tion Criteria	constant	± 3%	±10%	± 0.1	± 10 mv	<10		TO SALE OF THE PLAN
10:23									start sugar
10:32									ETUP SWRAIN
11:13	22								Balling
12:00	~18						21,000		4
12:50	50						51.000		
13:35	1 40							123.5	
14:00	50						857		
14:15	56						490		
14:27	65	11.53	0,330	10.59	770	144	215		
14:40	+3	1.65	0-325	10.34	7.07	114_	210		
14.50	10	11.72	0-337	0.01	7.70	105	389		
14.50	<u>85</u>	1.70	0.320	9.34	27.97	-79	23F		
15.00	90	11.73	0.332	- 4.31	7.8	<u>- 74</u>	313		
15:14		<u> </u>	0.52	$-\frac{1}{2}$	7.93	45	269		
		1.07	0 - 250	7.80	<u>+ 40</u>	<u> </u>	301		
- 12 - 210	100	11.70	0.344	070	<i>T</i> ,91	4/	308		well conjol
				_					· · · · · ·
Observations	I /Notes:	Pura	e Start Time:	17.0			Durge Deter	Manala	1 Lacad inc
YSI S/N	14FLOID	እ <u>ዓ</u>		10.00			Purge Rate:	VUNUAN	- Thused ON
								Nec	charge.
	(-1021	20						•	- q
							- 11-10		
				WNEL	1 com	plete	after ~1	5 hours	01
				1401	l. cont				
			•		ave	OBIVE	Nt.		
Signatura/al-	- 1 110	4		<u>,                                    </u>					
Joignature(S).									

5-et bailler will not go down.

* Fast recharge vare

Ç

1	TO REAL		$= f_{(X_{1}) \neq 1}$	90	WELL DEV	/ELOPMEN	T DATA SHE	ET		
C	lient:	NAVFAC			_ Proje	ect Number:	: 679580.09.F	W Brus	+117	···
	ocation:	OLF Coupevill	e		_	Well ID:	WI-CV-MW1	<u>13-24-5</u>		
E	vent:	Well Developn	nent		_	Sample ID:	: <u>NA</u>		21	
Ð	ate:	2/3/14	•		Samp	oling Team:	Melan	LL DICKES	<u>sn</u>	
N	leather:	350F. R	anu_		_					
		,	0	A 24						
_			Before	After					Ver	
	otal Depth:		119	114	_FI.(BIOC)		Me	easuring Device:	YOL	
D	epth to wate	er: <u>(•)</u>	110.4	114	_FT.(BTOC)				Turbix	uty meter
N	Vater Colum	n:	3.6	_D	_FT.					U
		<u>(x</u>	1.163		_GAL/FT.		Well Dia.	Volume	l	
N	Vell Volume:		0.59		_GAL.		(inches)	(gallons/foot)		
T	otal Purge \	/ol.:	5.9		_GAL.		1	0.041		
			•		_		1.25	0.064		
P	urge Device	:	<u>3-F+</u> B	aller			2	0.163		
	-	_					4	0.653		
							6	1.469		
5	a luc redie	C 4		The second second	FIE		<b>IETERS</b>	and the second		
-	_	Purge Vol.	Temp.	Cond.	DO I	pH	ORP	Turbidity	au bornel	
	Time	(nals)	°C	mS/cm	mall	SU	mV	NTU	Other: DIV	Color / Odor / Comment
h	Stabilizati	on Criteria	constant	± 3%	± 10%	± 0.1	± 10 my	<10	- Sec	
E	14:47	·								Beach Bailer
	15.00	2				- <u> </u>				Sume has
	10.10	<u>A</u>			+					Stonsum
	K . 20		-				1	121 000		Signal
F	0.0	MG 7						71,000		
	1.20							21000	112 0	
┿	08.10	10						1,000		CUER CLORED
$\vdash$	00.00								110.00	Surve Donio
$\vdash$	<u> 22:30</u>									
┝	<u>OM: au</u>	12.20						21/2/2/2		VVLI NOTICE
$\vdash$	04.50	10.05						7,000		
┝	10:00						+		114.0	E at LLC UN AUTODO
H	<u>10:15</u>								140	LAMUNERPI
	<u> </u>									
							<u> </u>			
F							1			
L										
- JC	Observations	Notes:	Purg	e Start Time			_	Purge Rate:		
Y	/SES/N	14 FIO	U2-B				•			
			-				( LANKA	Ina Drist	PNOUCH	h.
		<u>C-103</u>	120		well	not re	Linna		. Ita d	() WOALAOUNO
					4 0 1	un al	sout :	20 MIN	warv	
					port	for we		ZULUNA IA	rell-N	or thungh
					<u>ໍ</u>	nevel	$-n^{-1}$		- A IDA DI	Aar
		_				Wall	r +0	collect.	Surphy	
F	Signature/s):	110 4	R	1 7	•		THEAST	THUIT	tix and	<del>W512.</del>
- 12	III III MILLON CONSTRUCTION OF A STRUCTURE OF A ST						NA 100 100 100 100 100 100 100 100 100 10			-

				21	WELL DE	VELOPMEN	T DATA SHE	ET	.1.6	
	Client:	NAVFAC			Pro	ject Number	: 679580.09.f	E.WI Det	Alle	entra la la la completion de la completion
	Location:	OLF Coupevill	e			Well ID	WI-CV-MW	14-DM		
	Event:	Well Developm	nent			Sample ID	NA		1	
	Date:	2/5/1-		-	San	pling Team:	Melay	hre Dick	ISON/GI	REG WARREN
	Weather:	400F,0	<u>aug</u>		-					
	Total Douths		Before	After					11.000	
	i otal Depth:		173.50	<u> </u>	FT.(BTOC)		M	easuring Device	YSE	
	Depth to wate	er: <u>(-)</u>	122.40		FT.(BTOC)				Turbidu	tu neter
	water Colum	n:	<u></u>		Fr.					1
	Mall Maluma	<u>(x</u>	0.163		GAL/FT.		Well Dia.	Volume		
	well volume: Tetal Duran \		6.44	<u> </u>	GAL.		(inches)	(gallons/foot)		
	Total Purge V	(0i.: <u> </u>	79.9	L	GAL.		1	0.041		
	Dunna Daulas		10000	1701-6	144 -		1.25	0.064		
	rurge Device	• <u>r</u>	<u>winn</u>	WHTH	<u>unp</u>	-		0.163		
		•	4344	Baile	V '		4	0.653	]	
	P Mage 6		and the second second	THE PARTY OF			6	1.469		
- 1		Duran Mal		THE REF. CH	F	IELD PARAN	IETERS			
	Time	Purge vol.	lemp.	Cond.	DO	рН	ORP	Turbidity	(Mar DTA)	0-1
- H		(gals)	°C	mS/cm	mg/L	SU	mV	NTU	Ouler.	Color / Coor / Comments
	Stabilizati	on Criteria	constant	± 3%	± 10%	± 0.1	±10 mv	<10	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	and the print in the second
- H	11.49									Begin suraina
	19:00									STOPSULDING
H	12.10				-					pia dark and
	19.48	<u> </u>						21,000		surde.
	3:00						<u></u>			STODSURA/
RAN -	13.55	10					<u> </u>	71.000		darkardin
	14:34	30						21:000		119Nt-anaux
<b>n</b> r	15:15	45						71 000	123.00	
	15:30	<u>   55  </u>						71:000		
۳ [			11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							
_  .	_KES	IME Z	16/17							
Ļ	0830	WL=	122.52						12252	BETTAR QUMP
L	0930	70						MUDDY		
L	10.30	110	10.89	0,473	9.54	7.96	-265	7120		
	1045	115	11.30	2.471	RO	81	-294	51000	12590	
_  _	1050	120	035	-480		809	-7 w/p	7102	-	
L	1105	135	065	0.179	1	5.109	-170	7100	-	
L	110	STOP.				-		_	-	
- 19	Observations/I	Notes:	Purg	e Start Time:				Purge Rate:	U.T SON	
ľ	YSIS/N _	14F1010	<u>28</u>	100.000				<b>v</b>	<u></u>	
				RE					Ť	
		<u>(-103to</u>	0-267	are	٩					
		N I								

161-171'screen 171-176-57tsump

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Client:	ΝΔΥΕΔΟ			WELL DE	VELOPMEN	670580 00 F	ET 1 \\\/	an a	
Location:	OLF Coupevil	le			Well ID:	WI-CV-MW	065	Pac	e 1
Event:	Well Develop	nent		-	Sample ID:	NA		1 796	
Date:	02/13/20	17		- Sam	pling Team:	MAG	x EN00		
Weather:	SUNAY, MID.	to upper 30's	- «κ s ω»	G Z-4 Mph	1 <b>3</b>	<b>_</b>			
		Defere	A Han						
Total Denth	14	a . OS	Aller	ET (RTOC)	MEASUGED ON	, Ma	asuring Davica	NOT ADD	(CENSIDA) HEAL OWN
Denth to wai	ter $\frac{1}{\sqrt{2}}$	132 21	178 60	FT (BTOC) '	NORTH SIDE C	<u>م</u>	easuring Device.	CONDUCT) C	3 (C 10 ST26) HACH 200
Water Colun	un:	7.67	133:02	FT.	pue casino			(0103267), 5	816345F WLL (# 2425)
Trater objan	(Y	1-07		GAL/FT.		Well Dia	Volume	MULTIKAL (	013110)
Well Volume	<u>. 10</u>	18		GAI		(inches)	(gallone/foot)		
Total Purge	Vol.:	,~0	75 0	GAL		1	0.041	-	
i o tal i argo			431.9			1.25	0.064	•	
Purge Devic	e: 12	aver C	3'55)			2	0.163	-	
	<u> </u>		-		-	4	0.653	•	
						6	1,469		
0.7199.000 - 201020 -				FI	ELD PARAM	ETERS			
	Purge Vol.	Temp.	Cond.			ORP	Turbidity	MULTILLOE	
Time	(gals)	°C	mS/cm	mg/l	SU	mV	NTH	Other: (pm)	Color / Odor / Comments
Stabilizat	ion Criteria	constant	± 3%	± 10%	± 0.1	± 10 my	<10		
13:23	BEGIN DO	EVELOPINE	usic (Sun	5e)				1+5=00,82:00	
13:36	0.75	11.79	0.607	11.09	7.63	116.0	71000	θ	LIGHT BROWN, CLOUDY, NO OF
13:46	2.0	11.02	0.648	6.27	7.74	190.3	>1000	0	11
14:06	4.0	10.89	0.614	16.26	7 73	176.7	>1600	θ	" SLIGHTLY LIANTEL
14:18	5.0	10.90	0-615	16.46	7.73	191.6	71060	Θ	£ #
14:26	6.0	10.95	0.614	15.78	7.70	187. 7	71000	6	11
14:34	7.6	10,95	0.609	16.00	7.70	190.2	71000	Θ	LIGHT BROWN, CLOUDY, NO ODEL
14:46	8.0	10.96	0.606	16.03	7.72	192.4	71880	Θ	DTW @14:38= 134.75A
14:56	9.0	11.09	0.606	15.54	7.67	178.0	71600	Ü	LIGHT BROWN, CLOUDY, NO OSOL
15:05	10.0	11.30	0.611	15,29	7.66	173.6	>1660	θ	75
PAU	E DEVLLOP	NENT, US	20 RESU	<u>42.</u>			>10000	_ <del></del>	_ <u></u>
5:30	11-0	11.10	0.553	15.10	7.69	177-1	>1006	.0	
15:39	12.0	10-91	0-603	14.69	7.68	181.9	71000	0	**
15:46	13.0	10.93	6-609	14.75	7.66	184.7	>1686	Θ	LIGHT BROWN, CLUDAY, NOCOC
15:54	14.0	10.43	0.614	14.40	7.67	186.5	>1660	Θ	
6:02	15.0	10.95	0.612	14.10	7.65	188.3	11000	0	"
16510	16.0	10.91	0.625	17 61	7.66	188.4	71600	<u> </u>	
Decrustions	1,60  Notoo:	16-81 Dura	Clot Time	13-01	7.65	1 44.8	Durra Data	0 13	" SCHONTLY LESS CLOUD-
	motes:	Pulg	je Start rime:	15. 23			Purge Rate:	<u> </u>	ALIMIN
			61 01 02 01 02 01 02	000 RECHAR 13/17 411 13/17 DG 13/17 DG	26E. TO PARAMETS ; \$ TU:2810 > 10 WEL	= 140,4 FH +5 5+A 86E 184 NOT 5 4 CASING	1782 ) ATW= 134 385:005 TUN 574868 H H VOCUMES PUNC	.8FKTX 01-02/1 2311177, ns ce were ED,	4/201710 BEIS. DEVELOPMENT
Signature(s):	Man	l En b							

C	:H2MH								
			-15/15/25/25/25	WELL DE		T DATA SHE	FT		
Client:	NAVFAC			Pro	ect Number:	679580.09.F	L.WI		
Location:	OLF Coupevill	e		-	Well ID:	WI-CV-MW	065	PAGE	2. 0F2
Event:	Well Developn	nent		-	Sample ID:	NA			
Date:	62/13/1	7		Sam	pling Team:	MARK	ENDO.		
Weather:	SUNNY, MID	to upplar 30	3 67, S w was	= @ 2-4not	•				
		Before	After						
Total Depth: Depth to wat Water Colum	ter: ⊮ <u>(-)</u>	Belore		FT.(BTOC) FT.(BTOC) FT.		Me	easuring Device:	522 PAG	٤
	(x)			GAL/FT.		Well Dia.	Volume	1	
Well Volume	); 			GAL.		(inches)	(gallons/foot)		
Total Purge	Vol.:			GAL.		1	0.041		
<b>V</b>				• • •		1.25	0.064	1	
Purge Devic	e: 134	ILER (3'SS)	)			2	0.163	1	
-			·······		•	4	0.653		
						6	1.469		
	entralis e destructure de traba d Altra	1991년 281 124 139 13 1991년 281 124 139 139 139 1991년 1391년 1		F	ELD PARAM	ETERS			
Times	Purge Vol.	Temp.	Cond.	DO	pH	ORP	Turbidity	MULTIRAE	
lime	(gals)	°C	mS/cm	mg/L	SU	mν	NTU	or (%,)	Color / Odor / Comments
Stabilizat	tion Criteria	constant	± 3%	± 10%	± 0.1	± 10 mv	<10		
1628	18-0	10.94	0.623	13-69	7.6	181.9	723	Û	LIGHT BASUN CLOUDY, NO ODA
1072	DEVELOPING	WELL TO N	UN FOL THE	DAY . (ON	TINKE ON	02/14/17.			
0825	GN 02/14/1	7 - RESU	15 50268	3 BAIL ,					
0905	23.0	10.28	0.570	12.95	7.63	216.5	529	e	LIGHT GARY, MOSTLY CLOUD 4 .
0910	24.0	10.53	0.565	10.15	7.64	218.9	569	Ø	20
0920	25.94,500	10.49	0.574	8.64	7.66	220-1	352	Θ	ii .
	STOP	BAIL \$ SU	n <u>ce.</u>						
·									
Observations	/Notes:	Purg	e Start Time:				Purge Rate:		
YSI S/N							0		
	<b></b>			_		1			
		<b>.</b>		SEL	PAGE	•			
Signature(s):	Mont	End							

CH:	2MI	-IILL	-

				WELL DE	VELOPMEN	T DATA SHE	ET		
Client:	NAVFAC			Pro	ject Number:	679580.09.F	I.WI		
Location:	OLF Coupevill	е			Well ID:	WI-CV-MW	36 M		
Event:	Well Developn	nent		_	Sample ID:	NA			
Date:	02/13/20	דו	_	Sam	pling Team:	MARKE	2026		
Weather:	MOSTLY SUNN	2' 05 erm , M	To BU'S of	_					
Total Depth:	١ę	Before	After	MEASURED OF SIDE معنی HELL ET (BTOC)	u North L on ozliul Hamured	IT(BEFORE S	TANT ).	NET COM	or (# avazza)
Denth to wat	or: (.)		184.0	FT (BTOC)	ON SOUTH	5.052 000	easuring Device.	<u></u>	
Water Colum	en. <u>1-7</u>	<u>176,1</u>	1-13:21	FT.(DTOC)	of pvi w	17 EL.		HACH ZIGE CI	SOLGINIST WLI
	····			GAL/ET	ןצון בט אט	Woll Dia	Voluma	1C 103 267)	(*2425)
Well Volume	. <u>(^/</u>	7 10		GADEL - 4	ميتشار البيكي	(inches)	volume (collona/fact)	MULTICAL	(0103110)
Total Purgo		1.60	1.3.1	GAL.		(incries)		-	
i olai Fuige	201., <u>2</u>		124 (SAL (SN 024)	GAL.		4.25	0.041	-	
Purge Davie		weelst-		an a		1.20	0.004	4	
ruige Device	=. <u>{}</u>	12676 (213	SI, MANN	n lift fu	μh	4	0.103	4	
						4	0.053		
Ned of Strategy and the second	enne beergestersterstere	teri ana ana ana ana ana ana ana ana ana an		ing south and the second s			1.459		
				F	ELD PARAM	ETERS		MULTIRAE	
Time	Purge Vol. (gals)	lemp. °C	Cond.	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: (pp~)	Color / Odor / Comments
Stabilizat	ion Criteria	constant	± 3%	± 10%	± 0.1	± 10 mv	<10		
OS:HO	BEGIN W	24 02026	printi CSI	266)					
10:23	1SCAL	11.0	0.505	14.97	7.91	-38,3	71000	A.0	BLACKISH BROUSH , LLOJDY , NO CL
18:43	29600	10.21	0.534	13-11	7.71	-137.8	21006	0.0	GRAVINI BROWN CLOSEY, NO DA
11:10	HUGAL	10.97	0.532	13.91	7.63	-203.0	>1000	0.0	11
11:23	55mL	10.58	6.529	13.78	7.72	-101.5	950	a-0	GRAY, CLOUDY, NO COOL
11:35	FOCAL	10.69	0.538	11.45	7.62	-189.3	852	0.0	()
11:50	EBCAL.	10.30	6.543	13.18	7.64	-172.3	724	A.A	LIGHT GAAT, CLOUDT, NO COUR
204	RESUME SU	rine & pur	DONO	2/14/17 (	0950				, <u>, , , , , , , , , , , , , , , , </u>
69450	896AL	10.57	<u>છે-544</u>	4.68	7.65	~118.9	>18ê0	0.6	LIGHT BROWN, CLOUDY, NA COCL
1614	9760	10.66	0.548	5.03	7.63	-146.3	713	<i>θ.</i> θ	LIGHT GARY, CLAUDY, NO CONT.
1024	164606	10.76	0.546	4.26	7.69	-141.9	618	0.0	J.
1035	114CAL	10.74	9.543	3.81	7.58	-187.9	512	0.0	11
1845	124CAL	10-69	0.548	4.06	7.58	-149.3	378	0. <del>0</del>	VEAY LIGHT GMY, CLOUDY, NO COO
1056.	STOP	WELL DE	ELOPMENI						
Observations/ YSI S/N	Notes:	Purg	e Start Time:	68:4	0		Purge Rate:	0.42 (~)	L/MIN
•••				All PAR	AMETERS PURGEO FA	STABLE BU WH WELL,	ר פער אשי ז	ruabio174 。	> 10 WELL CASING
	<u></u>			00 02/1	1/17 RETUR	NN TO WE	L TO COMPLET	2 DEVELOPHE	ST. All PARAMETRIS
				STABLE (	JUT DU, TI	nB, OnP.	> 10 WELL C	ASINGLE PORCED	. 4 HAS OF
				well dev	ELOPMENT (	COMPLERS.	DTW @ COP	ALETION = 144	93 FHSTER
Signature(s):	Ma	L En						-184	SULSO QUS. ENOCR
									- 41

Ç c	H2N	71HILL						
				WELL D		T DATA SHE	ET	
Client:	NAVFAC			Pro	ject Number:	679580.09.F	I.WI	a von av ener de menoremento, en en en entre en entre en contractoremente de la contractoremente de la contractoremente de la contractore de la contractore de la contractoremente de la contractore de la contractore de la contractoremente d
Location:	OLF Coup	eville		-	Well ID:	WI-CV-MW&	275	
Event:	Well Deve	lopment		-	Sample ID:	NA		· · · · · · · · · · · · · · · · · · ·
Date:	<u>32/15/26</u>	17 -60		San	pling Team:	MARK	Erioc	
Weather:	LLCUNI 1	HID 40'S'F, SE W	NO 6 15-20	<u>0</u> ~~ph				
		Before	After		Scaffalt	130 -146 Ft	bcs	
Total Depth:		44.25	14 4.50	FT.(BTOC)		Me	asuring Device:	YSI 650MDS (MB3120) HARN 210HD
Depth to wate	r:	(·) 126 . SO	130.95	FT (BTOC)			Ū	(CI03207), SOLONIST WEL (#2425)
Water Column	1:	17.75		FT.				MULTIRAS (ALUZ 22)
		(X) 0.163		GAL/FT.		Well Dia.	Volume	
Well Volume:		2.89		GAL.		(inches)	(gallons/foot)	
Total Purge V	ol.:	26.00		GAL.		1	0.041	
				-		1.25	0.064	1
Purge Device:		5'some noola	ock 3'-6	3-25 GAL SS E	ALER	2	0.163	1
					-	4	0.653	1
						6	1.469	1
				F	IELD PARAM	ETERS		

radio della della degla della del Manada della de				F	IELD PARAN	ETERS			
Time	Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	MULTIRAE	
	(gals)	<u>°C</u>	mS/cm	mg/L	SU	mV	NTU	Other: (7-) or (0pm)	Color / Odor / Comments
Stabilizat	ion Criteria	constant	± 3%	± 10%	± 0.1	± 10 mv	<10		
10:50	BEGIN SI	VALIE 3 BAI	L.						
11:67	0.5	11.67	O-135	7.54	8-66	115.8	>1666	0.0	BALLON, CLOUDY, NO ODOS.
(1:1-)	1.5	11-69	0.232	7.53	8.46	67.6	>1000	6.0	14
11:28	2.0	11.67	0-251	7.39	8.38	103.5	21000	0.0	, Fi
11:39	3.5	11.72	0.283	7.23	8.29	105.4	71000	0.0	2.
in so	୍ଟ୍ର ଫ	11.69	0.334	6.54	8,18	110.8	874	0.0	BROWN LESS CLOUNY, NGO
12:02	6.5	11.63	0.384	6.44	8.06	121.6	690	0.0	11
12:14	8.0	11.64	6.427	5,81	7,97	100.4	529	0.0	" Drw= 134. 8 574
13:04	12.0	11.57	0.504	6.98	7.97	133.6	316	0.0	LIGHT BRILLIN, MODELLINY, NOOCO
13:20	3.5	11.42	0.523	6.80	7.85	145,9	28	0.0	11
13:40	14.25	11.41	0.537	7.42	7.86	167.1	365	0.0	11
13:50	15.75	11-45	0.545	7.61	7.86	167.2	346	0.0	"
14:00	17.25	11.38	0.350	7.20	7.84	156.2	250	0.0	а
14:11	18,75	11.28	0.553	6.77	7.80	135.7	202	0.0	11
14:20	20.25	11.42	0.559	7.07	7.80	124.1	223	6.0	0
14:28	21.75	11.41	0.566	7.20	7,81	135.0	245	G.Ö	11
14:37	23.25	11.46	6.569	7,33	7.78	146.0	184	6.0	11
14:55	25,25	11.43	0.591	6-82	7.79	175.6	93,0	6.0	" SLIGWICH LSSS CLOW
Observations/	Notes:	Purg	e Start Time:	10:50	ON 02/05/1	?	Purge Rate:	6.18 GAL,	Imins
YSIS/N _			IN ITIAL	50062 @ 11	0:50, 24	50262 0	11:12	~ · · · · ·	
			PAUS &	O 12:19	TO ALLOW	RECHARGE	RESUME BA	にいい ⑥ 1223	31, 070 0 13:04
			= 132.2	BFHSTOC, 3	ad SURAS 6	5 13:20 ::	STOP WELL C	DEVELOPHENT	@ 15:ed.
			A-II PA	ngnerus	STABLE BUT	ORP, TUR	BIDITY, >10	WELL VOLUM	45 PLUGO HINAS
			OF DEVS	1 DANEAT T	ind L	,	• -		
			0, 02, 1						
Signature(s):	Mad	ch						······	
·									

$\bigcirc$	CH2MHILL

Client:	NAVFAC			WELL DE Pro	VELOPMEN	T DATA SHE	ET I WI		
Location:	OI E Coupey	ille			Well ID	· WILCV-MW	A CA		
Event:	Well Develor	ment		-	Sample ID	· ΝΔ	5711		
Date	07/14/17 -	sinone	my astalis		nling Team	5100	/ <b>C</b> 10		
Weather:	Crausy, veri	305°F, SE	windos 4-6m	ρ×ι σαπ ρ×	ipang ream				
	(MGD SUFT)	Before	After		SCREENS	178-185 FH	202		
Total Depth	Borron	41.7	193.0	_FT.(BTOC)	SUMP 5 19	13+++55 M	easuring Device:	YSI GSBMOS (	CIOSIZO), HACH 21000
Depth to wa	iter: <u>(</u>	129.32	155-1	_FT.(BTOC)				(C103207) Se	chomist whe (#2425)
Water Colur	nn:	<u>     62.38     </u>		_FT. <u>~ (</u> #/	had Borrows )	1 4 2 4 m 4		n calisha	MULTIRAL
	<u>_</u>	x) Q-163		GAL/FT.		Well Dia.	Volume	CAN'S ENVI	MANT RUT LINE + OAC
well volume	e:	10.17		_GAL,		(inches)	(gallons/foot)	(Ama (m)	in a your proof field
Total Purge	Vol.: _		27.75	_GAL,		1	0.041	(CIO2033)	
		. / .		51 Souhe	¢ ບລ	1.25	0.064	04 02/20/1	7 SAME EQUIPMENT BUT
Purge Devic	:e: <u>6</u>	AILER (3' -	0-25 GAL SS.	, MANUCHE ET	- pointed	2	0.163	USING HOR	134 U-22 (C 102387) AND
						4	0.653	MULTIAAL (	2102922)
						6	1.469		
	「「「「「「「」」」	이 같은 것 같아?	an a she barnet a	F	IELD PARAM	<b>NETERS</b>			
<b>T</b> i	Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	MULTIME	
ıme	(gals)	l °C	mS/cm	ma/L	su	mV	NTU	Other: (7-) or	Color / Odor / Comment
Stabiliza	tion Criteria	constant	± 3%	± 10%	± 0.1	± 10 my	<10	A PCH	
15:49	BEGIN	SURGE & B	AIL "	1					
16:02	1.25	11.43	0.399	9.42	8.84	-488,9	71686	0.0	GRAY, WERY NIC ODM
16:20	3.0	11.34	0.300	9.82	9.29	-442.3	ZIBBO	A.6	//
16:32	<u>Ч.</u> А	11.15	A-294	8.75	9.38	- 309.4	21466	04	//
16:50	5.5	11:30	6.19%	7.96	9.26	- 318.4	71000	0.0	11
11:08	STOP WE	L NEVELOG	Pusur man	THS DAY	RESUME	CN 02/15-/1	77000		
09:10	1001 02/15/	11 - 000	LE SUDAS	PAU IN	S' suplat	010 0211317	3' 0 2555	RAUER	
69:36	6.25	11.57	A.292	NR NR	8.55	- 327.7	51000	A.A	C 191 VERY
10:64	14.0	11.69	A. 564	1.19	4.57	-371.2	71086	0.6	1.
10:15	11.0	11.67	A.400	1.88	8.55	-330 0	DIRAG	0.0	-
	96772 .	IDELL DEVE	MOMENT			5-0-0		0.0	
2/14/17/30	0.5	0					<b>`</b>		Drus= 1291.12
1740	7.5	14,30	0,437	5.38	7.82	-243	3 Notro		DFY DTW = 1881
1345	-/0-	fiel is a	/			· · · ·	////-		DTW = JEST HOS
1355	10	14.3)	0.453	175	7.78	-256,1	×1000		DRY
14/12	12-	14.29	0.48-2	1.48	17.75	~7381	3/000		ORY DIVIEIGE
1405		1-1-1-				27011			PTT 1771 bter
0			1						112 112 110
Observations	s/Notes:	Pur	ne Start Time	15:44	a czliuliz		Purge Rate	]	
YSI S/N			00 Olunt Hillion 010 O2	IIS/IT GOP	315 TU= 14	3. AFLADE.	DT-V= 136.176		
			CN 02	115/17 ( 0	SS THE	MANUAL LIP	- pomp wine	NOT DESCEND P	NST 114FHbes
			will s	URGE WI 5	SURGE RO	AND BAIL	STOP WELL C	XevelofilEnt, L	JILL RESTART
			UTILIZA	uh Suemensi	BLE PUMA				
	· · · · · · · · · · · · · · · · · · ·								
			COMPLE	TE WELL DE	VELOPMENT	G 11:52	ON 02/20/17.	2.7 WELL VO	DURGED ;
			nu Pha	AMETERS ST	ABLE BUT	TULGIVITY	, рН, 00, Н и	INS OF WELL	DEVALOPMENT
0:()	~ ~ /	<u> </u>	DTW =	ISS.IFtSix	T0 = 19	3. UFHSTOC			
Signature(s):	DUDLE HOL	- EM (VON)	t esta	NÓ	He			AND ANY	2 A law a l :
IAUS .	Con In		100 million	MolL	<u>- 50</u> -		NTU	(1.) o( pp:n)	COLOR / COMAENTS
1072	UN 02/20/17	RESURE	JEVEL COPTEN	T. SOME	w/ 51 SS	SURGE ROOM	BLOCK FOR 16+	UN TITEN BAN	1 W/ 3'-0.25 GAS SS B
	$DT \omega =  29$ .	3615700							•
11: <i>30</i>	26 cm			<b>L</b>					
11:39	7/7=	12.37	0.454	1.85	7.50	-)95		(	, MININAL SEDIMENT SSATE
litera d	20070	12.20	0,458	2 7 6	775		71860	0.0	LIGHT GAAY VERY
11352	27.75	12.26	a	****	1,12 -	-185	71000	A.Ö	- ··· · · · · · · · · · · · · · · · · ·
			0.460	3.08	7.89	- 184	Sinno		11
							1000	$\dot{\Theta}$ . $\Theta$	11

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Client: Location: Event: Date: Weather: Total Depth Depth to wa Water Colur Well Volume Total Purge	NAVFAC           OLF Coupevil           Well Developr           Ø2/16/2017           CLOUD4/LC           Charbon           *           *           *           (*)           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *           *	le ment -> 62/19 Sefore 24.1 121.5 2.6 ) 6.163 2.42	2016 ESE WIN After 121-3 121-3 2-25	WELL DE Pro: Sar 25 @ ۲ مواد 3 ۲ ۲.۱ FT.(BTOC) FT.(BTOC) FT. GAL/FT. GAL.	VELOPMEN bject Numbe Well ID Sample ID mpling Team	T DATA SHE r 679580.09.F : WI-CV-MW 0 : NA 	ET I.WI BSS ENDO, C leasuring Device Volume (gallons/foot) 0.041	<u>HORIBA U</u> (C103267), MULTIR	-22 (C101911), NACH 216 Saconist WLI (#2425) AE (C102663)
			,	_		1.25	0.064		
Purge Devic	e: <u>5</u>	SS SURG	E ROO/BLOCK	<u>, 3'-0-2</u>	<b>Տ</b> ራላር	2	0.163		
				SS BA	HLER	4	0.653		
						6	1.469		······
	<u> </u>	1		FI	ELD PARAM	ETERS			
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other:(*/) or (\$600)	Color / Odor / Comments
Stabiliza	tion Criteria	constant	± 3%	± 10%	± 0.1	± 10 mv	<10		
12:12	BEGIN	SURGE 7	BAIL (	BOTTOM 5	" ONLY).				
12:26	0,5	11.9	0.332	9.39	9,1	NA	>iece	ର-9	BROWN, CLOUDY, NO COOL
12:34	1.25	11.7	0.356	11.18	9.2	Au	>1000	6.0	"
12:39	1.5	STOP	WELL DEN	ELOPMENT	, WELL 1	S DAY.			
2/19/17 1237	BEGIN	BATAT	<u>ن</u> ې د						$DTW = 121.3^{1}$
1242		11.50	0.404	9,91	5.80	<u>N</u> IK	71000		
<u>i245</u>	0.75								
Observations YSI S/N _	/Notes:	Purg	e Start Time: דיר שדם שר או	12:12 , = 122.59 LL, Allow	ол c2/16/17 1' © 12: WELL TO RI	- 32, 570 2014111.6E,	Purge Rate: r וואייספעבעסייאע	0.08(4 ENT 0 12:30	NC WATER
			DN C Well I Level	12/20/17 DEVEZORME 5. A TOTA	AFTER DI NT WILL IL OF 35,	ISCUSSION BE PERFO INNTES DEV	W / E. EDDLE LMED G MW. SLOPING THE	B D. HOLSTEN OSS OUE T BOTTOM 3-S	, NC FURTHER To LOW ANATER Ft OF WELL SCREEN,
Signature(s):	Mark	Ente							

$\bigcirc$	CH2MHILL	-

Client				WELL DE	VELOPMEN	DATA SHE	ET		
Location:				. Proj	ect Number: Wall ID:	D/ 900U.U9.F	N.VVI रूच्य		
Event.	Wall Dovelopp	e			Semple ID:		2517		
Doto:	Well Developin			Same	Sample ID:		1 2:		
Date;	<u>()2//5/// ~7</u>	02/16/10		Sam	pling leam:	MARK	.ep90		
weather:	CLOSH, RAIN	, MID 4039-	5 <u>5 E wing</u> O	18-25mph					
Total Depth: Depth to wat	(MOD HARD)) BOTECA (-)	Before 75.10 120.82	After (V 175-2, 123,22	FT.(BTOC)	SCREEN	160-170 Ft55 Me	s easuring Device:	<u>YSI 650 MOS</u> (C183267), So	(C103120), HACH 21000 DICONIST WLI (#2425)
				GAL/ET		Wall Dia	Volume	MULTIRAE	(C 102633)
Well Volume	. <u>(^/</u>	S OF		GALIFI.		(inches)	(aclienc/fact)	013 02/16/1	F SAME INSTRUMENTS
Total Purge		10203		GAL.				13551055 45	E - USED HORIBA W.22
i otal Fulge		101.0	l	GAL.		1 25	0.041	(a sarad)	
Burne Devie	. 5	Sec. 1	. (-	al a are	SC Rouse	1.20	0.004	(C IBIGIT)	
Pulge Device	<u></u>	SS SURINE R	DO/BLOCK	0.2.6.1	22 DHILCAL		0,103		
	ł	- MUNNAL	LIFT PUMA			4	0.653		
	ing and the start strategy of the start of the		-	eka, sebesa wekaza kalem <u></u>		6	1.469		
de de service de la				FI	ELD PARAM	ETERS			n eren och er
Time	Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	MULTIRAG Othor (%)	Color / Odor / Commonte
1010	(gals)	<u>°C</u>	mS/cm	mg/L	SU	mV	NTU	(00m)	Color / Outor / Comments
Stabilizat	ion Criteria	constant	± 3%	± 10%	± 0.1	± 10 mv	<10	S17 - 2	
16:25	BEGIN SU	LOE & BAI	L .						
6:40	0.75	(2.22	0.467	5,23	10.08	111.8	71660	0.0	BROWNISH GRAY, CLOUDY, NO CE
16:49	2.2.5	12,25	0.466	4.78	10-06	54.8	>1000	6.6	"
17:00	3.75	12.08	G.479	4.81	9.96	26.5	51000	0.0	11
17:05	5.0	END DE	VELOPMENT	FOR THE DA	Υ.				
ON 02	116/17 BE	230 - RESI	ME DEVELO	PAZNT WI	MANUAL 1	JET PUMP			
09:26	18.0	11.7	<b>9-491</b>	7.5	7.2	NA	>1000	0-0	LIFHT BOOTH, (20 MIL) 1917
49:54	38.4	11-4	0-40	9,16	8.2	NA	>1000	0-0	//
10:15	58.5	11.6	0.383	9,68	E. 7	NA	71000	<i>Q.\U</i>	11
11:22	71.86	(1.8	0.382	828	85	NA	MARIC	N.A	7,
10:50	SURGE WE	LL_						······································	4
11:10	85.05	11.8	0.381	8.34	9.2	NA	21000	ÓL Ð	u
11:26	90.00	11.7	OVI	8.27	97	NA	71000	Q A	11
11:4 D	102.0	11.9	0.369	9-3954	42	N/A.	21800	0.0	4
11:45	END DEV	LOPMENT				<u> </u>		<u></u>	
	her f								
Observations	Notes:	Puro	e Start Time:	11.0.75	an antistr		Purge Rate		
YSLS/N			o otart milor	10020	0,0 0 2 1 0 7 1		i digo i dio.		
	······································		STOP W	ELL DEVELD	PHENT FUR	THE DAY	A 1705 No	1-122 MA	Children of
			RESUME i	)EVELOPHENT	00 02/16/1	7 10 0 834			
			e/	101 <b>= -1</b> 1141	( ASISI ~~		- UIW= 124	-++++++C, TO	= 1+5, 2Frotec.
			ייט/לטדנ	artaine with	L DEVELOP	MCNI (G) I	1:45 - AH P	ANNETENS STA	BLE BUT ORP
			AND TUR	BIAITY.	> 10 WELL 1	ICLUMES P	URGED AND	HHRS OF W	ELL DEVELOPMENT
			R51(4ED.						
<u></u>									
Signature(s):									· · · · · · · · · · · · · · · · · · ·

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Client:NAVFAC:Project Number 67980.09.FLWILocation:OLF CoupevilleWell DevelopmentSample ID: NAEvent:Well DevelopmentSample ID: NADate: $0 \ge 1/7/17$ :Sample ID: NAWeather:Monter Susawy, prio 403-15, 5 wing 6 2-14 mpATotal Depti:(hand Taumow)BeforeAfterTotal Depti:(hand Taumow)FT.(BTOC):Measuring DeviceItal Depti:(hand Taumow)FT.(BTOC):Measuring DeviceWater Column:13.2.2FT.(Lics2 (27.3), Socialis7 wint (24.242s))Water Column:13.2.2FT.(Multi Table (Columne))(x) Q-163GAL/FT.Well Dia.(Volume)(x) Q-163GAL/FT.Well Dia.(Volume)Total Purge Vol.:GAL.10.041Purge Device:5' SS South & non/discut, 3'-0.25 columne State4(gals)"Sc mS/m mg/LSouth & social stateTimePurge Vol.Cond.DOTimePurge Vol.Cond.DOStabilization Criteriaconstant±3%±10%±0.110:39S66.ml JSLL DEVECeptemer, Social St SSister Loci / S' SS South & non/discut, 1/1Sister Vector(d) 51Q. 511.2, 20.5384, 55(d) 51Q. 511.2, 20.5315.415(gals)Stock (24.1)5.4195.419(gals)Stock (24.1)5.4195.419(gals)Stock (24.1)5.4195.419(gals)S
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$
Event:Well DevelopmentSample ID: NADate: $0 \cdot 2 \ln 1/17$ :Sampling TeamMaxue ExcoWeather:Mesner Sussey, pto 403*5, S wing 6 2-4 mpASempling TeamMaxue ExcoBeforeAfterSchéer ViewI do 160 Fortown)BeforeAfterSchéer ViewI do 160 Fortown)BeforeAfterSchéer ViewI do 170 Fortown)BeforeAfterSchéer ViewI do 180 FriegisI do 180 FriegisNote: I do 190 FriedI do 180 FriegisI do 180 FriegisI do 180 FriegisI do 200 Frieding DeviceI do 22 (colspan="2">I do 20 FriegisI do 200 Frieding DeviceI do 200 Frieding Device<
$\begin{array}{c c c c c c c c c c c c c c c c c c c $
Weather:Mostrix Survey, Aro 403YF, Survey, G 2-4 ApdScreek:: 120-130 FHbg3 (Ab Source)Total Depth:130.9FT.(BTOC)130.9FT.(BTOC)Measuring Device130.9FT.(BTOC)Measuring Device130.9FT.(BTOC)Measuring Device130.9FT.(BTOC)Measuring Device130.9FT.(BTOC)Measuring Device130.9FT.(BTOC)Measuring Device130.9FT.(BTOC)(Lics2 (27), Socoris or ULE (M2425)Mourt Ante (2 102922)Well Volume:2.15GAL.Total Purge Vol.:GAL.Total Purge Vol.:GAL.Total Purge Vol.:GAL.Total Purge Vol.:GAL.Total Purge Vol.:GAL.Total Purge Vol.:Total Purge Vol.:Time Purge Vol.Time Cond.Double Cond.Stabilization CriteriaCond.DOUBL PERECEPTATION:Stabilization CriteriaStabilization CriteriaStabilization CriteriaStabilization CriteriaStabilization Criteria
$\begin{array}{c c c c c c c c c c c c c c c c c c c $
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$\begin{array}{c c c c c c c c c c c c c c c c c c c $
Purge Device: $5^{'}SS SONAE ADD/BLOCK, 3'-0.2SGAL SS$ 1.250.064BAILER.20.163BAILER.40.653G1.469FIELD PARAMETERSTimePurge Vol.Temp. (gals)Cond. PCDO mS/cmpH mg/LORP SUTurbidity mVMOUTT BAE Other: CA) Other: CA) Other: CA)Color / Odor / Comments (pPr)Stabilization Criteriaconstant $\pm 3\%$ $\pm 10\%$ $\pm 0.1$ $\pm 10$ mv<10
Purge Device: $5^{i}$ SS Sonche Rep/BLOCK, $3'$ -0.25GAL SS20.163BAILER.40.65361.469FIELD PARAMETERSTimePurge Vol.Temp.Cond.DOpHORPTurbidityMOLTTRAEColor / Odor / CommentsStabilization Criteriaconstant $\pm 3\%$ $\pm 10\%$ $\pm 0.1$ $\pm 10 \text{ mv}$ <10
$\begin{array}{c c c c c c c c c c c c c c c c c c c $
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $
FIELD PARAMETERS         Time       Purge Vol. (gals)       Temp. °C       Cond. mS/cm       DO mg/L       pH       ORP mV       Turbidity NTU       MULTIRAE Other: (1/2)       Color / Odor / Comments         Stabilization Criteria       constant       ± 3%       ± 10%       ± 0.1       ± 10 mv       <10
TimePurge Vol. (gals)Temp. °CCond. mS/cmDO mg/LpH SUORP SUTurbidity mVMULTTRAE Other; (1/2)Color / Odor / CommentsStabilization Criteriaconstant $\pm 3\%$ $\pm 10\%$ $\pm 0.1$ $\pm 10 \text{ mv}$ <10
Imme(gals) $^{\circ}$ CmS/cmmg/LSUmVNTUUner; (A)Color / Odor / CommentsStabilization Criteriaconstant $\pm 3\%$ $\pm 10\%$ $\pm 0.1$ $\pm 10 \text{ mv}$ <10
Stabilization Criteriaconstant $\pm 3\%$ $\pm 10\%$ $\pm 0.1$ $\pm 10 \text{ mv}$ <1010:301366104 $\omega \leq L$ 0 EVELOPMENT, SUZGE 10/5'SS SUZGE ROD/BLOCK AND6412 $\omega / 3'$ 0.25GAL SS BAILERSIGNIFICANT AN10:510.511.90.5384.559.5NA710000.6LIGHT VERY11:181.7512.20.5415.499.2NA710000.61111:25PAUSE DEUZLOPMENT0.5415.499.2NA710000.61111:25PAUSE DEUZLOPMENT0.5415.499.2NA710000.611614711:25PAUSE DEUZLOPMENT0.5415.499.2NA710000.611614711:25PAUSE DEUZLOPMENT0.5415.499.2NA710000.611614711:25PAUSE DEUZLOPMENT0.5415.499.2NA710000.65.50011:536.45RESUME DEUZLOPMENT0.5415.495.5100.65.500
10:30       13661N WELL DEVELOPMENT, SOICHE W/ 5'SS SUICE ROD/BLOCK AND BAIL W/ 3' 0.25GAL SS BAILER SIDNIFILANT, AND 10:51       0.5       11.9       0.538       4.55       9.5       NA       71000       O-O       LIGHT VERY GROWT, NO COOL       SIDNIFILANT, AND SILT VERY GROWT, CLOUPT, NO COOL       SIDNIFT, SETTENT, SETTENT, SETTENT, SETTENT, SETTEN
10:51       0.5       11.9       0.538       4.55       9.5       NA       71000       O.0       Light VEW BROW, CLOUD, NO COOL       FINE SAND         11:18       1.75       12.2       0.541       5.49       9.2       NA       71000       O.0       "         11:25       PAUSE DEVELOPMENT       0.541       5.49       9.2       NA       71000       O.0       "         11:25       PAUSE DEVELOPMENT       0.541       5.49       9.2       NA       71000       O.0       "       FAND \$ SUF         11:25       PAUSE DEVELOPMENT       0.541       5.49       9.2       NA       71000       O.0       "       F SAND \$ SUF         11:25       PAUSE DEVELOPMENT       0.541       5.49       9.2       NA       71000       O.0       F SAND \$ SUF
11:18     1.75     12.2     0.541     5.49     9.2     NA     71006     0.0     11       11:25     PADE DEUZLOPRENT     III     IIII     IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
11:25 PAUSE DEUZLOPMENT
11:50 65 REDUME DEVELOPMENT (BAILING YI JIOOG OLG LIGHT VLWY F SAND & SILL"
12:35 6.5 13.5 0.565 5.77 8.9 NALY
12:51 8.0 12.3 0.570 6.84 8.8 NA 71000 0.0 "
13:07 9.5 11.6 0.575 7.10 8.7 NA >1000 0.0 "
SKINOSZO RESULE DEU, SURGENO FOR IGMIN THEN BATE W 3'gt bailer DARK BROWN PTW =117.6 He
Observations/Notes: Purge Start Time: ۱۵: 30 د. د. ۲/۱۳/۱۰ Purge Rate:
YSIS/N
STOP WELL DEVELOPMENT GISSET ON OZHTINT FOR END OF DAY, DTW = 117. T7 F+hrold
Signature(s):

<b>.</b>				WELL DE	VELOPMEN	DATA SHE	ET				
Client:	NAVFAC			:Project Number 679580.09.FI.WI							
Location:	OLF Coupevil	le		-	Well ID: WI-CV-MW&8/M						
Event:	VVell Developr	ment	<u></u>	-	Sample ID: NA VI-CV-MVA8M 3						
Date:	- 47 (6/14 Eng 4	APLL LIS	in charl	:5ai La	mpling leam	() (I. I.	<u>1-1611, MA</u>	IK ENdo		-	
weather:	30 1		~ <u>~ (000</u>	IJ						-	
		Before	After		SCREENS	1 50 - 160	Ftbys		(C101911)		
Total Depth:		128	165.4	FT.(BTOC)	Sump G	1651b5s :M	leasuring Device	Horiba	had Hach	2100 QK Hast	
Depth to wat	er: <u>(-)</u>	NA	132.4	FT.(BTOC)				MultiRae (	C1Q26631 5012115+	WL] (HOUS	
Water Colum	ın:	NA	33.0	FT.					- ,,		
	<u>(x</u>	)	6.163	GAL/FT.		Well Dia.	Volume	60 0	>2/17/17 USE SAME	Echnibuters:	
Well Volume	: <u>A</u>	10.72	5.379	GAL.		(inches)	(gallons/foot)	1305	MULTINE (CO2912)	UTILIZED,	
Total Purge	Vol.:	36,7		GAL.		1	0.041				
						1.25	0.064				
Purge Devic	e: <u>7</u> 2	it. 0.25	gal SS be	iler		Ø	0.163				
	5'	55 50.26	2 ROO/BLO	scre		4	0.653				
· · · · ·	M	4NU#L LI#	т родр.			6	1.469			τ.	
i 	1	1		FI	ELD PARAMI	ETERS					
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: (7/) 0-	Color / Odor / Comments		
Stabilizat	ion Criteria	constant	± 3%	± 10%	± 0.1	± 10 mv	<10				
13:40	begin b	i lucol	developme	nt)							
13:57	2.0								Too thick to me	sure	
14:09	2.75	11,9	0.904	4.94	. 10.1	NA	7/202		Thick gray no a	Lor Dudy	
(4:27	4.75	11.7	0.715	the topic	.1.4	NA	71009		4 4 3		
14:30	REAKSON	unch, tes	me e 141	45	, fo						
15:03	7.5	12.0	0.823	6.38	11.3	NA	71200		gren, no usal,	cloudy	
15:26	9,25	12.0	0.695	6.35	11.9	NA	5 1000		Y.		
15:45	11.25	11.6	0.695	4.21	il.	NA	> laaa		1/		
16:07	13.00	11.5	0.611	3.12	11.5	NA	Zlaa		1		
16:15	berin s	ulal/									
6:35	13.75	11.3	0.(09	<b>U.</b> 7	11.2	NA	21290		4		
16:55	Stop WI	a servi	opment.	For che	of day	total	$P_{u}r_{g}c = 16.5$	Í ga l			
08:38	01 02/17	/17 OTU	= 122.1	3 Ftbrac .	RESUME	PUMPING	WELL (UT	V 12172 MAN	LAL LIFT PUMA)		
<u> </u>	28.4	10.8	0.704	6.20	<b>G</b> . 8	NA	71886	<i>6.0</i>	LIGHT USUY BROUND CLARY, NO OD	pvz.	
09:07	23.4	11.1	0.636	7.92	9-17-68	4M	>1600	6.0	" DTW = 123	IFTBTOC	
09:22	25:21-70	11-0	0.598	3.84	9.6	N٨	71666	<i><del>0</del>.0</i>	LIGHT VIELY BROWN, CLANDY, NO OF	io-c	
09:33	36,9	11.5	6.576	3,68	4.7	NA	71000	6.6	11		
69:45	36.7	11.5	O.567	4.70	9.7	NiA	71293	0.0	11		
Observations/	Notes:	Purg	e Start Time:	13:40 3.3	02/16/17		Purge Rate:	0.10 4	+L/min		
YSI S/N _			97	12850	: Vely	508+	UNCONFIL	med total	1 bepth, Water		
			leva	indi cati	y No S.	GARL, M	.0 Recordab	le mater.	Column may		
			be q	full of	muz.	· 2/11/1	1 13:25	- 1	0		
			7/16/12	15:10 CL	سامه کاری	יקושני וועיקנשני	- 10100 Las 20 (60 ha	raina. TN =	165.350	L	
			G 1655	5 TD=	CHAND BO 165. 4Ftbr	ν <b>ωμ</b> παη) ος , Ότω	= 125.36Ft57	OC (RECHARLIN	NG) som Asur		
Signature(s):	Marte	7	@ 89: 4	15, 4 11ni	CC DEVE	OPMENT .	AMPLETS SA	£ 6 8	UULINGE DITALES	MEU.	
·····			<b>D</b> · ·		->-D		<u> </u>	<u></u>			

ONLY PH STABILIZED. TO = 165, 4 Ftbroc (HARD BOTTOM), DTW = 127.1 FTATOC (RECHARGING)



former inner and the		-	Self- Regional A	WELL DE	EVELOPMEN'	T DATA SHE	ET			
Client:	NAVFAC			Project Number: 679580.09.FI.WI						
Location:	OLF Coupev	ille		Well ID: WI-CV-MW ILS						
Event:	Well Develop	oment			Sample ID:	NA				
Date:	02/14/17 -	102/20/17		Sam	pling Team:	MARKENDO				
Weather:	CLOUTH, MID 3	o'sof, se whom i	0 5-10nph	<u>.</u>						
		Before	After .							
Total Depth:	: 3	40.4	140.4	FT.(BTOC)		M	easuring Device:	YSE GEOMOS	(C103120) HACH 210	
Depth to wa	ter: (	-) 131.38	135.35	FT.(BTOC)				(C103207) S	OLONIST WEI (# 242	
Water Colur	nn:	8,71		FT.				MULTIRAE ( # C107 727)		
	(	x) 0.163		GAL/FT.		Well Dia.	Volume			
Well Volume	e:	1.42		GAL.		(inches)	(gallons/foot)	ON 02/20/17		
Total Purge	Vol.:		7.0	GAL.		1	0.041	- HORIBA U-22 (C102387)		
			0.25 6AL SS	). 5' SS SURGEROD/BLOCK		1.25	0.064	MULTI RAE (CIB2922)		
Purge Devic	e: í	BAILER (3'.					0.163			
					- n G -	4	0.653			
						6	1.469			
				F	IELD PARAM	ETERS				
Time	Purge Vol.	Temp.	Cond.	DO	pH	ORP	Turbidity	MULTIRAS		
Time	(gals)	°C	mS/cm	mg/L	SU	mV	NTU	Other: Chi or	Color / Odor / Comment	
Stabiliza	tion Criteria	constant	± 3%	± 10%	± 0.1	± 10 mv	<10			
14 25	BEGIN	TO BAIL U	JELL + SUN	HE						
1442	1.75	10.27	6.325	8.89	7.95	-66.9	>1600	0-0	LIGHT BROWN, CLERTH, NO	
1452	3.75	10-24	6-298	9.57	7.58	146-2	>1000	0.6	41	
2/19/17 1400	BEG	TH BAI	ING 3	si bailer					DTW = 131.2	
1420	1	10.20	0.308	10.25	6.80	NA	71000	4		
1430	1.5	10.20	0.303	9.89	6.90	NA	917		1	
1436	2.25	10:20	0,300	9.92	7.00	NA	951			
1457	3.5	9.50	0.326	8.58	7.2	NA	71000		1	
	WELL D	124				California and	·			
08:15	ON 02/20	12017 D:	TW = 132.7	bree , B	BEAN SUR	he wi 5	SS SURGE R	D) Brock.		
08:45	STOP SULE	E, BEGIN	BAILING W	3'-0.25	CAL SS BAI	LER.	C 660		(MINIMAL SETTLING SED	
09:65	5:25	10.85	0.404	9.59	6-19	104	*>100040	6.0	BROWN, CLOUPY, NO ODC	
09:47	6.0	11.01	0.368	9.53	6.85	73	777	0.0	BROWN, CLOUDY, NO ODOL	
A 09:55	7.0	were on	1.							
	Dbservations/Notes:     Purge Start Time:     14:25 on o2/14/17     Purge Rate:     0.13 cm									

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WELL DEVELOPMENT DATA SHEET											
Client:		11-									
Location:											
Event:	vven Develop	Ineni		Sample IU: NA							
Uale:			-	:Sampling Team							
Wednier.				_							
		Before	After								
Total Depth:	·			_FT.(BTOC) :Measuring Device							
Depth to wa	ter: <u>(-</u>	)		_FT.(BTOC)							
Water Colur	nn:			_FT.		F	1	1			
<u>(x)</u>			_GAL/FT.		Well Dia.	Volume					
Well Volume:		_GAL.		(inches)	(gallons/foot)	-					
Total Purge	Vol.:			_GAL.		1	0.041				
						1.25	0.064				
Purge Devic	e:				-	2	0.163	-			
						4	0.653				
						6	1.469				
	1	Τ	T	FI	ELD PARA	METERS	<b>I</b>	1			
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other:	_ Color / Odor / Comments		
Stabilizat	ion Criteria	constant	± 3%	± 10%	± 0.1	± 10 mv	<10		171 8		
2/14/17/520	BEGIN	SAILEN	ــــــــــــــــــــــــــــــــــــــ						prov=+11,0		
1527	1.15	10.20	0.636	5.63	7.40		71000				
15-47	1.25	Syla	NG 4	+ SWAD							
1600	BEGI	- BATL	500						PTW 131.3		
16110	2.25	10.20	0.632	6.60	8.60	NA	71050				
1630	4.0	10.30	0.661	6.20	5.30	いみ	טבטור				
	5700 6	ATLIN	ن								
• • • •											
Observations	Notes:	Purg	e Start Time:				Purge Rate:				
YSI S/N											
_			Α 'π	STAL OF L	times an	25HINA	ES SPENT DE	velonal,	WELL . A TOTAL		
			06 4	ίστω ειι ν	OLUMES 1	DULGED, NO	PARAMETERS S	TABILIZED -			
						,					
Signature(s):	Mark	Ente									

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Attachment 3 Survey Reports
#### NAS Coupeville, WA

#### Survey Date: February, 2017

		Monitor	ing Wells		
			Top of Metal	Top of PVC	
			Case	Casing	
Pt.#	Northing	Easting	Elev.	Elev	Description
108	439611.38	1202426.49	194.97	194.61	MW01M
109	439604.95	1202430.71	194.99	194.58	MW01D
106	439062.88	1202352.24	193.53	193.17	MW2
107	439065.11	1202358.17	193.57	193.11	MW2M
111	439397.60	1201756.79	193.50	193.14	MW3M
110	439391.27	1201759.66	193.49	193.07	MW3D
112	440487.00	1201338.34	193.53	193.20	MW4S
113	440483.04	1201341.55	193.54	193.19	MW4M
117	438248.04	1201506.33	190.93	190.38	MW5S
118	438254.53	1201503.60	190.99	190.64	MW5M
100	437394.46	1202643.62	198.40	197.97	MW6S
101	437400.58	1202641.22	198.38	197.87	MW6M
123	441209.76	1200340.48	200.54	200.02	MW7S
124	441202.27	1200339.00	200.32	199.57	MW7M
114	441676.84	1202815.43	205.53	205.17	MW8S
115	441676.52	1202808.83	205.42	205.21	MW8M
126	436988.92	1200524.67	187.57	187.15	MW9S
127	436991.02	1200530.74	187.55	187.23	MW9M
104	436186.13	1203182.90	188.58	188.33	MW10M
105	436180.75	1203179.80	188.62	188.25	MWI0D
121	443692.06	1199626.40	202.44	202.01	MW11S
122	443696.16	1199632.00	202.57	202.14	MWIIM
102	433273.82	1204137.37	187.38	186.97	MW12S
103	433269.90	1204130.83	187.28	186.85	MW12D
119	437634.55	1200712.10	189.56	189.28	MW13S
120	437627.11	1200713.17	189.37	189.11	MW13M
116	439885.76	1200752.61	191.95	191.61	MW14M
125	437210.89	1200752.91	190.69	* 188.40	MWAAX557
128	439301.20	1202094.00	197.40	* 196.04	MW

NOTES

1. HORIZONTAL DATUM: NAD83/11. WASHINGTON STATE PLANE COORDINATE SYSTEM NORTH ZONE NAD83-11 WSDOT MONUMENT USED FOR PROJECT

COUPEVILLE 3" BRASS DISK W/ PUNCH IN CONC "USC & GS COUPEVILLE 1954"

GP15525-16 3" BRASS DISK W/ PUNCH IN CONC

Y 344 3" BRASS DISK IN CONC "USC & GS Y334 1952"

J 328 3" BRASS DISK W/ PUNCH IN CONC 0.40 ABOVE SURFACE "USC & GS J328 1952"

GP15020-1 3" BRASS DISK W/ PUNCH IN CONC

2. VERTICAL DATUM: NAVD88 BENCHMARK USED COUPEVILLE ELEV 199.347 BENCHMARK USED J328 ELEV 199.754 BENCHMARK USED GP15020-1 ELEV 233.011

# 3. BENCH MARK: 2" BRASS DISC CITY OF SEATTLE SNV-2541, LOCATED AT BACK OF SIDEWALK AT NE QUADRANT OF INTERSECTION OF EAST BOSTON STREET AND 24TH AVE EAST ELEVATION 73.167 FEET

4. * ELEV AT GRD - UNABLE TO OPEN DUE TO RUSTY BOLTS

5. EQUIPMENT USED LEIKA GS15 GPS SYSTEM LEICA DNA 3 DIGITAL LEVEL



Outlying Field Coupeville, NAS Whidbey Island, Oak Harbor Washington

True North Project Number: J16-192

Date of Survey: February 21-23, 2017

Survey Crew: Ivan Steele (Party Chief) and Stephan Wilson (Instrument person)

Equipment Used:

- GPS Leica GS15 Viva System
- Level Leica DNA 3 Electronic Level with Bar coded Rod

### Horizontal Datum

- Washington State Plane Coordinate System North Zone NAD83/11 based on the following 5 WSDOT GPS Monuments
  - 1. Coupeville
  - 2. J328
  - 3. GP15020-1
  - 4. GP115525-16
  - 5. Y344

Vertical Datum

- NAVD88 based on the following three site benchmarks
  - 1. Coupeville Elevation 199.347 feet
  - 2. J328 Elevation 199.754 feet
  - 3. GP15020-1 Elevation 196.778 feet

### Purpose of The Survey

The purpose of the survey was to establish horizontal and vertical position of 16 to 20 new monitoring wells and two existing monitoring wells.

#### Survey Procedures

Horizontal Position of all monitoring wells was based on GPS observations using a Leica GS 15 RTK System. 5 WSDOT GPS Control monuments were tied twice during the course of the survey. The occupations were done over the course of two days. A report showing the residuals for the GPS is attached.

Vertical Position of the wells was established by differential levels using a Leica DNA 3 digital level and a bar coded rod. All level loops were closed and adjusted if the closure was greater than 0.02 feet. All elevations were taken on the metal rim and on the northerly side of the PVC Casing. Per Scope of Work, the PVC casing was turned through for all wells.

#### Daily report

On February 21, 2017 the survey crew left their Seattle office and headed to Coupeville to meet up with Eric Epple at Outlying Field in Coupeville Washington. Once at the site the crew went through a safety briefing and then was shown the locations of the wells. The tasks for the day included establishing elevations on the monitoring wells and to located 5 WSDOT GPS monuments. The crew began running levels from the Benchmark "Coupeville". The benchmark in located near the north end of the air strip. The survey crew ran to 4 wells then closed their level loop back to "Coupeville" The error of closure was 0.019 feet. No adjustment was needed on the 4 wells. A second loop was run from "Coupeville" to 4 more wells. The loop was closed back to "Coupeville". The error of closure was 0.025 feet. The elevations of the 4 wells were adjusted based on proportioning. The proportioning is based on dividing the error of closure to the number of turns. The maximum adjustment to the monitoring wells was 0.01 feet. Prior to leaving the site the crew surveyed three WSDOT GPS Control Monuments, "Coupeville", "J328", and "GP15020-1" The crew notified CH2M Hill that they were leaving the site for the day then proceeded to tie two more WSDOT GPS Control Monuments, "GP15525-16" and "Y344".

Day 2 started with the second GPS observations of the five WSDOT Monuments, two of which were off site. The other three were within Outlying Field. Prior to working on the airfield, a safety briefing took place, then the crew continued tying the WSDOT monuments. The next task was to establish horizontal location of each monitoring well. That was done by RTK GPS. After the horizontal location of the MW's were completed, the crew continued establishing elevations for the wells. The first loop of the day started from the Benchmark "Coupeville" and ended at the Benchmark "J328". The closure between the benchmarks was 0.011 feet. No adjustment was needed. 8 wells were surveyed within the first loop. The second level loop began at "J328" and ended at BM GP15020-1, 4 monitoring wells were elevated. The closure was 0.011 feet. Elevations were not adjusted. The third level loop of the day began at "GP15020-1 and closed back to the same Benchmark. 4 Monitoring Wells were elevated. The error of closure was 0.021 feet. The 4 Monitoring Wells were adjusted based on proportion the error. A maximum adjust of

0.014 was applied to the wells. The day ended after checking out with the CH2M Hills representative.

Day 3 started with a safety briefing then the crew started the final level loop. The loop started from "Coupeville and closed to Benchmark "J328". 9 wells were elevated. The error of closure was 0.012 feet. No adjustment was required.

The GPS was processed by Jerry Reed and the levels were reduced by Tim Ingraham. Input of the data into the spread sheet was done by Nelson Ortiz and checked by Tim.

- when it has to be right

### **Twostep - Transformation Report**

Processed: 03/13/2017 11:38:18

Project Informati	on					
Project name:		System A WHIDBEY COUPLEVILI	LE FOR REPORT	System B Whidbey Coup	peville w/2-step Ground	
Coordinate Syste	em Information Sy	vstem B				
Coordinate system na	ame:	WA N NAD83 12A				
Created:						
Transformation name	;	-				
Transformation type:		2				
Height mode:		2				
Residuals:						
Local Ellipsoid:		GRS 1980				
Projection:		WA N NAD83				
CSCS model:		-				
Transformation of	letails					
Height mode:		Orthometric				
Pre-transformation na	me:	NULL				
3D-Helmert transform	mation					
Number of common p	oints:	5				
Transformation model	:	Bursa-Wolf				
No.		Parameter	Value			
1		Shift dX	0.0000 fts			
2		Shift dY	0.0000 fts			
3		Shift dZ	0.0000 fts			
4		Rotation about X	0.00000 "			
5		Rotation about Y	0.00000 "			
7		Scale	0.00000 ppm			
2D-Helmert transform	nation					
Number of common pe	oints:	5				
Sigma a priori:		1.0000				
Sigma a posteriori:		0.0059				
Rotation origin:		X0:	438140.0637 fts	5		
		YO:	1202772.5027 f	ts		
No.		Parameter	Value		rms	
1		dE	-0.0404 fts		0.0086 fts	
2		dN	-0.0141 fts		0.0086 fts	
3		Rotation	-0° 00' 00.06860	r.	0° 00' 00.25374" 1.2202 ppm	
+ Height transformatio	n	Stale	-0.9011 ppm		1.2302 ppm	
Number of common po	pints:	5				
Mean transformation a	ccuracy:	0.0144 fts				
Parameters:	v.	-0.00002798	-0.00000446		74.2728 fts	
Inclination of height in Inclination of height in	X: Y:	-0° 00' 05.77129" -0° 00' 00.91994"				
Residuals						
Grid:						
System A	System B	Point type	dE [fts]	dN [fts]	dHat [fts]	
COUPEVILLE	COUPEVILLE	Position + height	0.0038 fts	-0.0186 fts	0.0132 fts	
GP15020-1	GP15020-1	Position + height	-0.0132 fts	-0.0033 fts	-0.0033 fts	
GP15525-16	GP15525-16	Position + height	0.0103 fts	0.0123 fts	-0.0039 fts	
J328	J328	Position + height	-0.0132 fts	-0.0181 fts	0.0069 fts	
Y344	Y344	Position + height	0.0122 fts	0.0277 fts	-0.0129 fts	

Graphical overview:



Attachment 4 Groundwater Sampling Data Sheets

# ch2m:

P3 1/2

				GROUND	WATER SAMP	LING DATA	SHEET		
Client:		NAVFAC		Pro	oject Number	679580	OG.FT.WS		
Location:	OLF CON	DEUTU	.E	-	Well ID	WI-CI	J- MW OTY	<b>`</b>	
Event:	SPRIDUG	2017 au	SAMATNO	5	Sample ID	WI-C	I-GWOTM	1-0317	
Date:	3/4/17			Sa	mpling Team	EROS	A. BILY	EU	· · · · · · · · · · · · · · · · · · ·
weather:	CIOS, OUE	newst		-					
Total Dept	th:	193,0	FT.(BTOC)			M	easuring Device:	Honzon	0.22
Depth to v	water: (-	129.35	_FT.(BTOC)				Date and Time:	7/4/17 1	445-
Water Col	umn:	63.65	FT.					1	
	<u>(</u> )	() 0.163	_GAL/FT.			Well Dia.	Volume		
Well Volu	me:	10.37	_GAL.			(inches)	(gallons/foot)	l,	
Total Purg	je vol.:	0.0	_GAL.			1 25	0.041	-	
						2	0.004	-	
Fuige Dev		חץ זכע	NACEA C	2000	_	4	0.103	-	
							0.000	1	
	11				SAMPLE	DATA			•
Date: 3/	417	Temp.	Cond.	DO	pH	ORP	Turbidity	Other: 07	Color / Odor / Commonte
Time: '		°C	mS/cm	mg/L	SU	mV	NTU	btoc	
Method:						12			
					FIELD PARA	METERS			
	Purge Vol.	Temp.	Cond.	DO	DH	ORP	Turbidity		
Time	(gals)	°C	mS/cm	ma/L	SU	mV	NTU	Other: DTW	Color / Odor / Comments
1445	0	11.40	0,464	5.62	6,25	-72	57,8	130,1	USAN/opences
1450	0,3	11.54	0.455-	2.52	6,81	-119	50.3	131.5	
1455	0.6	- 11.71	0.453	1,95	7.38	-15-3	45.6	132.4	
1500	0.9	11.74	0,451	1.53	7,69	-169	28.0	133,4	
1505	1.2	11.44	6,451	1.33	7.95-	-180	8.8	135.2	
1510	1,6	11.56	0,449	1.25	7.99	-190	10.4	136.1	
1515	1.9	11.74	0,449	1.17	8.04	-195	8.1	136.9	
1520	2.2	11.66	0.449	1.10	8.01	~199	12.0	137,45'	
1525	2.5	11.32	0.449	1.10	8.04	-202	12.5	158.2	
1330	218	11.75	0.448	1.03	8.03	1206	14.1	139.5	$\sim$
Sample inf	formation: met	hod containe	r number size	and type n	reservative us	ed	L1.C	171.6	
	An	alvsis	1 110111001, 0120	Pres	ervative	1	Container requirer	ments	No. of containers
PFC	- 537	Imo		Per	5	125	ml HOPE		2
		11.045							
Ohaanatia	history			Deines	A. A. A				
Observatio	ons/inotes: 10	o psi Z	20-30 50	- dische	yes 10-20	5 Suow	2 dischar	n 200-2	SZO me hunde
Dump Sta	rt Timo:	100		VOC Pood	ing:	2010	OBSERIABL	E DRAWDO	sun ul
Fump Sta	nt mile.			VUC Reau	ing. O.O r		STABILIZA	ALEN W	144-145-1
Pump Der	oth: 185	bottom	of puno		active		USE DUC	STELL P	UNPER FUTCHERS.
		00.00							
Sample /T	ime:	1-	718 cc	net	IWI-	-cu - Gu	0- Mroc	3174	
MS/MSD	NA	-		Duplicate II	DNO .: NA				
Signature(	s):	0							
	//	TN	NL						
6	7 5	\$ 7/8	PO						
~	in v	. /							
		$\sim$							
		/							

# ch2m:

## GROUNDWATER SAMPLING DATA SHEET

pg 2/2

	Client:		NAVFAC		_ Pi	roject Number:	679580	.09, FJ.WS			
	Location:	OLECON	PEUTLL	E	-	Well ID:	WI-CU-	-MWOFM			
	Event:	SPRENC	2017 6	NSOMAC	Pre	Sample ID:	WI-W	-6007M-	0317		
	Date:	3/4/17			S	ampling Team:	Eress	A. BELYE	<u>ں</u>		
	Weather:	403, OV	ERCAST		-						
	Total Dep	th	193 0	FT (BTOC)			M	easuring Device	HARTRA	0-7-	7
	Denth to y	vater: (.	1129 35	ET (BTOC)			IVI	Date and Time:	3/11/2 11	IUS	U
	Water Col		121:00	_FT				Date and Time.	2/4/17 19	195	
	Water COI	(init).	03:03	GAL/FT			Well Dia	Volume	1		
	Well Volu	me. 7	10 32	_GAL			(inchos)	(gallons/foot)			
	Total Pure		2 A	- GAL			1	0.041			
	ាចដោកជារួ	Je vol	3,0	_041.			1 25	0.064	•		
					700		(2)	0.163	-		
	Fulge Dev	nce. Dr	555 1-A!	VACEA 4	200		<u>C</u>	0.103	-		1.85
							4	0.055			
	des ties :					SAMPLE I	DATA	Ţ			
	Date: 3	4/17-	Temp.	Cond.	DO	pH	ORP	Turbidity	Othory	Color	Odar / Commonto
	Time: 15	50	°C	mS/cm	mg/L	SU	mV	NTU		COIOF /	Odor / Comments
	Method.L	on flow 1		1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.							
	meenou.	VOLUME								and the second second second	
					L	FIELD PARA	METERS	T		1	
	Time	Purge Vol.	lemp.	Cond.	DO	pH	ORP	Turbidity	Other:	Color /	Odor / Comments
		(gals)	°C	mS/cm	mg/L	SU	mV	NTU			
	1550	4.0	11.94	0,480	1.60	8.01	-186	28.3	143,4	CLEA	n/odenie st
	1600	4,5	11.90	0.449	1.63	7.98	-186	24.1	144.5	-	
	1620	5.0	11.49	0.447	1162	7.98	- 151	19.7	145.5		
12-	1625	5.6	11.09	6.445	2.83	7.93	-169	18.2	145.4	AINI	RIBBLES
6.6	1630	0.6.7.5	11.43	0.448	2.50	7.93	-176	20.4	14572		
	1635	6.5	11:27	0.448	1:75	7.92	-165	15.2	145.3		
	1640	7.0	(1.14	0.448	1.69	7,93	-156	17.7	99314514		
	1645	7.5	11.15	0,447	1.68	7,90	-166	7,5	145,4		/
	1650	8	11.10	0.448	1.69	7.91	-162	10.1	145.2		
			1.1.1								
	Sample int	ormation: met	hod, containe	r number, size	, and type,	preservative use	ed.		a an this barres		
		An	alysis		Pre	servative		Container requirer	nents	No	. of containers
	2000	537/	mas		Zer	2-	128 1	ml HORE		2	
		/	1								
					0						
	Ohandia										
	Observatio	ons/Notes:	100 1252	= 20-30	ser re	charge 10	-Z6 Sec	discharge 1	25-m1/3054	er 2	250 - 300
		·	-						/ // -	ŀ	allain
	Pump Sta	rt Time: 144	5		VUC Read	aing: 0.0 pr	r,				100000
		1. 100-1	1.11.			wellLe	rd.				
	Pump Dep		botten of	purp							
		. ,	7.0	Acces Fact	$\int$			F			
	Sample /T	ime: I	117	COLLECT	IWT.	- CU - Giul	M-D	ST			and the second second
	MS/MSD	N.A			Duplicate	ID NO .: NH					
	Signature(	s):	) A AI		fine de la company						
			11 1.1	$\Omega i$							
			4 19	N.6							
				V						1	
	$\mathcal{L}$	W	P								
			/	2							



## GROUNDWATER SAMPLING DATA SHEET

P3 1/2

Client:		NAVFAC		_ Pro	ject Number	679580	109. FI.WS			
Location:	OLF COUR	EVILLE			Well ID:	WI-C	J-MW675			
Event:	SPATIS	GW SAM	MPLINO 20		Sample ID:	WI-C	U- 60075	-0317		
Date:	3/4/17-		-	San	npling Team	ENOS	A. BIL	E		
weather:	40-50° ; a	EREAST		-						
Total Dept	th: <u>1</u> 4	14,5	_FT.(BTOC)			Me	easuring Device:	HONIBA	0-22	
Depth to v	vater: (-)	126.42	FT.(BTOC)				Date and Time:	3/4/17 12	200	
Water Col	umn: /	18.08	_FT.					_ / ·		
	<u>(x</u>	0.163	_GAL/FT.			Well Dia.	Volume			
Well Volu	me:	2,94	_GAL.			(inches)	(gallons/foot)			
Total Purg	ge Vol.:	3.4	_GAL.			1	0.041			
<b>D</b>						1.25	0.064			
Purge Dev	lice: 1553	st pau	ACEA Z	200	-	2	0.163	-		
						4	0.653	]		
	1.1				SAMPLE	DATA				
Date: 3/	4/17	Temp.	Cond.	DO	pH	ORP	Turbidity			
Time:	_/	l °C	mS/cm	mg/L	SU	mV	NTU	Other:	Color / Odor	/ Comments
Method . Lo	ow Flow		6.01		(2)	+ 1 - 0			1	
Methou.		0.1	0.01	0.2	0.1	J I ID				
				T 50	FIELD PARA	METERS				
Time	Purge Vol.	Temp.	Cond.	DO	pH	ORP	lurbidity	Other: DTC	Color / Odor	/ Comments
1760	(gals)	Un C	mS/cm	mg/L	SU	mV	NTU			
1200	0.25	12.81	0.683	6.17	3.12	229	57.9	127.5	CIEAR, OHC	nuesi
1205	0.4	12,11	0,645	2.61	6.46	199	41.7	127.6	<u> </u>	
1216	0:6	11.01	0.613	2.10	0.67	105	31.4	127.6	+	
1213	0.4	11.10	0.619	2.10	0.	115	22.6	127,7	<u>├</u>	
1220	1.2	12.00	0,615	192	720	164	240	121.8	+	/
1730	14	11.45-	0.619	1.82	7.77	167	359	1200	- V	
1735	1.4	1124	0.1.20	4.72	7.7.2	160	118/1	177.9	AZIE BURA	51 58
1240	10	11.77	0.623	338	7.2.8	161	54.0	127.8	UEAD JO	malser
17.45	7.0	11.11	6.67.0	2.55	7.30	144	3.7.	127.8	1	10.00 0 5
1250	2.1-	11.94	0.615	2.43	7.31	161	4.9	127.8	V	/
Sample inf	ormation: meth	od, container	number, size	, and type, pr	eservative us	ed.				
	Ana	alysis		Prese	ervative	(	Container requirer	nents	No. of co	ontainers
PFC	- 53-	7/mors		Par		125	- mi hopiz	P	2	
		/								
										ST. S. O.
Observatio	ns/Notes: 7	o psi	@ 124	o see r	eetinge	20 Sec	dischar	100-125-1	milia	
Duran Otan	4 Times 14				/		0	SIEILUIA IZI IT	This	
Pump Star	rt lime: 1200	0 3/4/1-	7	VUC Readin	ig: 0.0	Ppm	01	Stepilizal	and po	with
Dump Dop	the Trial to	tor- 13	si hter (	botton)	wellthe	2	DILAI	-DOWN STER	YEENETT	¥ . 5 (5
Pump Dep		stula					TO F	LOW RATE		_012
Sample /T	imo: 140	ht	COLLECT	- WI-	- CU - GU	1075-0	317 132	5		
	111e. 140	DIC		Dunlicate ID	No: NA					
Signature	NH al:	>								
Signature	» <u>).</u>	A-	7							
/		Str	1							
(	mr	0 y	$ \land \land \land$							
C	~ -		/ ~							
		/								
		V								



pg 2/2

Client: Location: Event: Date: Weather: Total Dep Depth to w Water Col Well Volu Total Purg Purge Dev	CLF Covers         \$ press 20         3 ]4 [17]         40° \$ (000         th:       /1         water:       (•)         lumn:       (x         me:       2         ge Vol.:       2         vice:       3	NAVFAC EUTLLE DVZ ON SA 2002 ON S	- - 	GROUND Pro Sa	VATER SAM oject Numbe Well II Sample II mpling Tean	$\frac{ PLING DATA}{ PLING DATA}$ $\frac{ PLING DATA}{ PLING DATA}$ $\frac{ V  - c}{ V - c}$	SHEET 2.09.PI.ws - ww075 - GW075 - Bilyes easuring Device: Date and Time: Volume (gallons/foot) 0.041 0.064 0.163 0.653	-0317 Hontisa ( 3/4/17	J-ZZ
	1				SAMPLE	DATA			
Date: 3 4	4/2017	Temp. °C	Cond. mS/cm	DO ma/L	pH SU	ORP mV	Turbidity NTU	Other:	Color / Odor / Comments
Method:	our Feur								
	VOLUME					AMETERS			
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO ma/L	pH SU	ORP	Turbidity NTU	Other: DTw	Color / Odor / Comments
1255	2.4	11.87	0.625	2.32	7.30	160	10.7	127.8	CLEAR/JOANLES
1300	2.6	11,97	0,625	2.34	7.35	155-	16.6	127.8	
1305	2.8	11.55	0.625	2.40	7.40	154	3578	127.8	
1310	3.0	11.57	0.624	2.25	7.40	156	37.8	127.8	
1315	3.2	11.46	0,621	2,48	7,39	160	10,4	127.85	W/
Sample inf	formation: meth	nod, container	number, size	, and type, p	reservative u	ised.			
	Ana	alysis		Pres	ervative	(	Container requirer	nents	No. of containers
	Pfe	537/m	vo	Zer	2	12	s ml f	1DP IE	
Observatio	ons/Notes:								
Pump Sta Pump Dep	rt Time: pth:		EE P	VOC Readi	ing:	3/4/17-	325 WI	-cu-Gw	075-0317
Sample /T	ime:	ب ب							
MS/MSD	NA	-		Duplicate II	DNO. NA	/			
Signature(	s):	e l	SY G	6					

# ch2m:

#### **GROUNDWATER SAMPLING DATA SHEET** NAVFAC Client: Project Number: 679580,09.FI.WS Well ID: WI-CU-MW135 Location: OUT COUPEUTURE Sample ID: WI-CU-GW135-0317 Event: SPRING 2017 OW SAMPLING Date: 3/3/17-Sampling Team: EROS D. BUTEU P.6 Weather: 40's, RAINY, WINDY 20 mph FT.(BTOC) Total Depth: Measuring Device: HORIBA U-ZZ 114.70 Depth to water: (-) 110.25 FT.(BTOC) Date and Time: Water Column: 4.45 FT. GAL/FT. Well Dia. Volume (X)0.163 Well Volume: 0.73 GAL. (inches) (gallons/foot) 0.75 **Total Purge Vol.:** GAL. 0.041 1 1.25 0.064 3' disposeble beiler Purge Device: 2 0.163 4 0.653 SAMPLE DATA Date: 3/3/17 Temp. Cond. DO pH ORP Turbidity Other: DTW Color / Odor / Comments Time: 1400 °C mS/cm SU mg/L NTU mV Method: BAREN FIELD PARAMETERS Purge Vol. Cond. DO Temp. pH ORP Turbidity Other: DTW Color / Odor / Comments Time (gals) °C mS/cm SU mV mg/L NTU 0.75 Dry CLEAR/OPINESS 1400 11.69 0.812 10.12 5.75 212 126 127397 1 FTCO 5.71 1 10.54 127 DRY 12.40 0.747 Sample information: method, container number, size, and type, preservative used. Analysis Preservative Container requirements No. of containers Pfc PER 125 ml HOPE 2 537/mon Observations/Notes: VOC Reading: 0.0 Ppm Pump Start Time: NA helled Pump Depth: NA WI-CU-GW135-0317 Sample /Time: 1705 Duplicate ID No .: NA MS/MSD NR Signature(s): 2 cf By



GROUNDWATER SAMPLING DATA SHEET       Deficit INCLOSE       Deficit INCLOSE       Deficit INCLOSE SAMPLING DATA SHEET       Deficit INCLOSE SAMPLING DATA SHEET       Sample INCLOSE SAMPLING DATA SHEET       Deficit INCLOSE SAMPLING DATA SHEET       Sample INCLOSE SAMPLING DATA SHEET       Deficit INCLOSE SAMPLING DATA SHEET       Sample INCLOSE SAMPLING DATA SHEET       Deficit INCLOSE SAMPLING DATA SHEET       Total Depth:       DATA SHEET FLIPS       Method INCLOSE SAMPLING DATA SHEET       Method INCLOSE SAMPLING DATA SHEET       Sample INCLOSE SAMPLING DATA SHEET       Total Depth:       DATA SHEET FLIPS       Method INCLOSE SAMPLING DATA SHEET       Method INCLOSE SAMPLING DATA SHEET       Total Depth:       OCID INCLOSE SAMPLING DATA SHEET       Method INCLOSE SAMPLING DATA SHEET       TOTA DATA SHEET TO DESTREES Concord Data Program       Total Depth INCLOSE TO DESTREES Concord Data Program       Total Depth INCLOSE TO DESTREES Concord Data Program       Sample Information: method, container number, size and type, preservative used       Analysis <td c<="" th=""><th>V</th><th></th><th></th><th>SM</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></td>	<th>V</th> <th></th> <th></th> <th>SM</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	V			SM							
Client: <u>Leader Values</u> Leadon: <u>Stratus 2017 for Sample Number</u> <u>275 280, 65, 757, 145</u> Well <u>Stratus 2017 for Sample Number</u> <u>275 280, 65, 757, 145</u> Well <u>Stratus 2017 for Sample Number</u> <u>275 280, 65, 757, 145</u> Sample ID: <u>WT-Current25</u> Sample ID: <u>WT-Current25</u> Sample <u>100, 55, 771,8700</u> Purge Device: <u>Court</u> <u>71,8700</u> Purge Device: <u>Court</u> <u>71,8700</u> <u>71,8700</u> Purge Device: <u>Court</u> <u>70,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,0000</u> <u>71,00000</u> <u>71,0000</u> <u>71,00000</u> <u>71,00000</u> <u>71,00000</u> <u>71,00000</u> <u>71,00000</u> <u>71,00000</u> <u>71,00000</u> <u>71,00000</u> <u>71,00000</u> <u>71,000000</u> <u>71,000000</u> <u>71,000000</u> <u>71,0000000</u> <u>71,0000000</u> <u>71,000000000000000000000000000000000000</u>						GROUNDW	ATER SAMP	LING DATA	SHEET			
Location:       21-2       Constructions         Date:       51/17       Sample file:       No         Total Depti:       100, 11, 12       Sample file:       No         Valter (if is guares y to the start is	Client:			NAVFAC		Proj	ect Number:	679580	, 69, FI. WS	· · ·		
Event:       Sample D:       Sample D:       Sample D:       Sample Size Size Size Size Size Size Size Siz	Location:	OLF	100	PEVZU	C.R.		Well ID:	WI-CL	1-mw125	0		
Date:       SAMPLE Call         Total Depth:       102_0_1         FI, (FTCC)       Measuring Device: +tor.com/A       2_2	Event:	SPRIN	6 .	2017-60	SAMPLEN	2	Sample ID:	WI-CO	-Gent 1	VA EP	3/1/17	
Tread Depti:       100.5.       FT.(BTOC)         Depti howater:       100.5       FT.(BTOC)         Depti howater:       0.1.5       FT.(BTOC)         Depti howater:       0.1.5       FT.(BTOC)         Depti howater:       0.1.5       FT.(BTOC)         Depti howater:       0.1.5       FT.(BTOC)         Detain Optime:       0.1.5       FT.(BTOC)         Date and Time:       0.1.5       GAL.         Purge Vol:       Color       GAL         Date:       Temp.       Cond.       DO         Time:       "cond	Date: Weather:	5/1/1	7			Sam	pling Team:	5:205	A. BELTE	v P.L		
Index Depth I.       Desc.       FILEUS, FILEUC/ PLICE, FILEUCC/ PLICE, FILEUCC/ PLICE, FILEUCC/ PLICE, FILEUCC/ PLICE, FILEUCC/ Water Column:       Index, FILEUCC/ PLICE, FILEUCC/ FILEUPARAMETERS       Date and Time: JIL /= - JIL /= - - JIL /= - JIL /= - JIL /= - JIL /= - JIL /= - JIL	Total Don	<del>40 \$ (12</del>	10	<u> </u>	ET (BTOC)			M	acuring Dovico:	()	~ <b>&gt;</b> ~~	
Depin formation:       Differ       FT.       Differ	Donth to y	ui. vator:	()	10.5	_FT.(BTOC)			INIC	Date and Time:	TOLLING U	22	
Water Colonini.       Clock       CALIFT.         Well Volume:       GAL.         Cold Purge Vol.:       GAL.         Purge Device:       GAL.         125       0.064         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.161         2       0.161         2       0.161         2       0.162         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2 </td <td>Weter Col</td> <td>water.</td> <td>0</td> <td>106.1</td> <td></td> <td></td> <td></td> <td></td> <td>Date and Time.</td> <td>3/1/17</td> <td></td>	Weter Col	water.	0	106.1					Date and Time.	3/1/17		
Weil Volume:       M.O. (LS_CAL)       OALPT.         Total Purge Vol.:       GAL.       Inchesi (gallonsfoot)         Purge Device:       GAL.       1.25       0.064         2       0.163       4       0.853         Date:       Temp.       Cond.       DO       PH       ORP         Time:       *C       mSicm       mgl.       SU       mV       NTU         Method:       Imme.       *C       mSicm       mgl.       SU       mV       NTU         Method:       Imme.       *C       mSicm       mgl.       SU       mV       NTU       Other. D7::-       Color / Comments         Method:       Imme.       *C       mSicm       mgl.       SU       mV       NTU       Other. D7::-       Color / Comments         Time       Purge Vol.       Temp.       Cond.       DO       pH       ORP       Turbidity       Other. D7::-       Color / Comments         Time       Purge Vol.       Temp.       Cond.       DO       pH       ORP       Turbidity       Other. D7::-       Color / Comments         Sample information:       method.       container requirements       Non-of_containers       Non-of_containers <t< td=""><td>Water Cor</td><td>unn.</td><td></td><td>5.4</td><td></td><td></td><td></td><td>Wall Dia</td><td>Volumo</td><td>1</td><td></td></t<>	Water Cor	unn.		5.4				Wall Dia	Volumo	1		
Weil volume:       OAL.         Cital Purge Vol.:       OAL.         Purge Device:       CAL.         125       0.064         2       0.163         2       0.163         2       0.163         2       0.163         2       0.164         2       0.163         2       0.164         2       0.163         2       0.164         2       0.163         2       0.163         2       0.163         2       0.163         2       0.164         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         2       0.163         3       1000         1100       00         1100       00         1100       00         1100       00         1100       00         1100       00         1100       00         1100       00	Well Velo		(X)	0.165	GAL/FT.			well Dia.	volume			
Tota Purge Vol.:       C       OAL.         Purge Device:       BATLEN       1.25       0.064/2         2       0.163       0.653         Date:       Temp.       Cond.       DO       pH         Time:       "C       mS/cm       mg/L       SU       mV         Method:       Image:       "C       mS/cm       DO       pH       ORP       Turbidity       Other. DTM:       Color / Odor / Comments         Method:       Image:       "C       mS/cm       DO       pH       ORP       Turbidity       Other. DTM:       Color / Odor / Comments         Method:       Image:       "C       mS/cm       DO       pH       ORP       Turbidity       Other. DTM:       Color / Odor / Comments         Method:       Image:       NTU       UMAGE:       To       REstructure;       Color / Odor / Comments         Sample information: method, container number, size, and type, preservative used       Non-of container s       Non-of containers         Sample information: method, container number, size, and type, preservative used       Non-of container requirements       Non-of containers         Observations/Notes:       VOC Reading:       UMAGE:       To       Destructure;       Granuments         <	Total Dure			-	-GAL.			(incres)	(gallons/loot)			
Purge Device:     BATLER     1.23     0.0043 4       Date:     Temp.     Code     DO       Time:     "C     mSicm     mg/L     SU     MV     NTU     Other.     DTU       Method:     Image: SU     MV     NTU     Other.     DTU     Color / Odor / Comments       Time:     "C     mSicm     Mg/L     SU     MV     NTU     Other.     DTU       Time     Purge Vol.     Temp.     Cond.     DO     pH     ORP     Turbidity     Other.     DTU       Time     Purge Vol.     Temp.     Cond.     DO     pH     ORP     Turbidity     Other.     DTU       Image: SU     mV     NTU     Other.     DTU     Color / Odor / Comments       Time     Purge Vol.     Temp.     Cond.     DO     pH     ORP     Turbidity     Other.     DTU       Image: SU     mV/D     NTU     Other.     DTU     Color / Odor / Comments     DU       Sample information:     medical subscience     Image: SU     NTU     Image: SU     Image: SU       Sample information:     medical subscience     Container requirements     NTref.     NTref.       Observations/Notes:     Image: SU     Imagee: SU     Imagee	Total Puly	je vol		0	_GAL.			4.25	0.041			
Purge verte:     Date:     Temp.     Cond.     DO     PH     ORP     Turbidity     Other.     Other.     Other.       Ime:     °C     mS/cm     mg/L     SU     mV     NTU     Other.     Other. <td< td=""><td>Durge De</td><td>deel</td><td>7</td><td></td><td></td><td></td><td></td><td>1.20</td><td>0.004</td><td></td><td></td></td<>	Durge De	deel	7					1.20	0.004			
SAMPLE DATA       Date:     Temp.     Cond.     DO     pH     ORP     Turbidity     Other @7cv     Color / Odor / Comments       Method:     Image:	Purge Dev	nce.	<u>174</u>	JUZAL			•	4	0.653			
SAMPLE DATA         Date:       Temp.       Cond.       DO PH       Turbidity       Other @7000       Color / Odor / Comments         Method:       FIELD PARAMETERS         Time       Purge Vol.       Temp.       Cond.       DO       pH       ORP       Turbidity       Other @7000       Color / Odor / Comments         Time       Purge Vol.       Temp.       Cond.       DO       pH       ORP       Turbidity       Other @7000       Color / Odor / Comments         Time       Purge Vol.       Temp.       Cond.       DO       pH       ORP       Turbidity       Other @7000       Color / Odor / Comments         Time       Purge Vol.       Temp.       Cond.       DO       pH       ORP       Turbidity       Other @7000       Color / Odor / Comments         Method:       UMAGET       UMAGET       Color / 0dor / Comments         Method:       UMAGET       Color / 0dor / Comments         Method:       UMAGET       Color / 0dor / Color / 0dor / Comments         Sample information: method, container number, size, and type, preservative used.       Otheremethod:       Ot										1		
Date:       Temp.       Colu.       DO       print       Other       Italianity       Other.       Columnation       Columnatin and and and and and and and and and an	Deter			Tomp	Cond	DO			Turbidity		T	
Intell       C       Install       Ingl       SU       Inv       NTU         Method:       FIELD PARAMETERS         Time       Purge Vol.       Temp.       Cond.       DO       pH       ORP       Turbidity       Other. Drw.       Color / Odor / Comments         Image:       °C       mSigm       mg/L       SU       mV       NTU       UvalSLE       To         Image:	Date.			remp.	Conu.	D0	pH		NITL	Other: DTW	Color / Odor / Comments	
Method:       FIELD PARAMETERS         Time       Purge Vol.       Temp.       Cond.       DO       pH       ORP       Turbidity       Other. Drew       Color / Odor / Comments         Image: Color / gais       *C       mS/cm       mg/L       SU       mV       NTU       Other. Drew       Color / Odor / Comments         Image: Color / gais       *C       mS/cm       mg/L       SU       mV       NTU       Uv/ASLET TO         Image: Color / gais       Mage: Color / Mage:	Time.			U	m5/cm	mg/L	50		NIU			
FIELD PARAMETERS         Time       Purge Vol.       Temp.       Cond.       DO       pH       ORP       Turbidity       Other.       Down         Image: Supervision of the state o	Method:											
Time     Purge Vol.     Temp, (gals)     Cond.     DO     pH     ORP     Turbidity     Other Direction     Color / Odor / Comments       Mark     SU     mV     NTU     Umasket its     Image: Su     NTU     Umasket its       Mark     Mark     Mark     Mark     Image: Su     NTU     Umasket its       Sample information: method, container number, size, and type, preservative used.     Analysis     Preservative     Container requirements     No-of containers       Observations/Notes:     No     Umasket its     VOC Reading:     Umasket its     Container its       Pump Depth:     NA     Sample filme:     NA     Sample information:     Sample information:						F	IELD PARA	METERS				
(gals)       *C       mS/cm       mg/L       SU       mV       NTU       Generation         Note       Image: Sum of the second seco	Time	Purge V	/ol.	Temp.	Cond.	DO	pН	ORP	Turbidity	Other Drev.	Color / Odor / Comments	
Image: Constructive of the second		(gals	)	°C	mS/cm	mg/L	SU	mV	NTU			
Image: Restrict regime in the second seco											UNABLE TO	
Sample information: method, container number, size, and type, preservative used.       No. eL container requirements         Analysis       Preservative         Container requirements       No. eL containers         ND       E         Observations/Notes:       UNAGUE TO DETREELE GROUPANTEN         Pump Start Time:       NA         Sample Information:       NA         Dupbeth:       NA         Signature(s):       Duplicate ID No.:         MA       MA			_								RETRARIE	
Sample information: method, container number, size, and type, preservative used.         Analysis         Preservative         Container requirements         No-of containers         ND-of container         ND											WATBE	
Sample information: method, container number, size, and type, preservative used.          Analysis       Preservative       Container requirements       No-of containers         No-of container       No-of containers       No-of containers         No-of container       No-of containers         No-of container       No-of containers         No-of containers       No-of containers         Pump Start Time:       No-of containers         Signature(s):       No-of containers         No-of containers       No-of containers         No-of containers       No-of containers         No-of containers						NA	_					
Sample information: method, container number, size, and type, preservative used.         Analysis       Preservative         Container requirements       No-of containers         No-of container       No-of container         Pump Depth:       No-of container         Signature(s):       No-of container         No-of container       No-of container         No-of container       <												
Sample information: method, container number, size, and type, preservative used. Analysis Preservative Container requirements No-of containers												
Sample information: method, container number, size, and type, preservative used.         Analysis       Preservative         Container requirements       No-of containers         No-of container       No-of containers         No-of containers       No-of containers         Observations/Notes:       UNNELE TO 225772521E Concern         Pump Depth:       No-of containers         Signature(s):       Image: No-of containers         No-of containers       Image: No-of containers         No-of containers       Image: No-of containers         No-of containers       Image: No-of containe												
Sample information: method, container number, size, and type, preservative used.         Analysis       Preservative         Container requirements       No-of containers         No-of container       No-of containers         No-of container       No-of containers         No-of container       No-of containers         No-of containers       No-of containers         Observations/Notes:       UNNEQUE TO RECOMPACT         Pump Depth:       NA-         Signature(s):       No-         Signature(s):       No-												
Sample information: method, container number, size, and type, preservative used.          Analysis       Preservative       Container requirements       No. of containers         ND m       Image: Container requirements       Image: Container requirements         ND m       Image: Container requirements       Image: Container requirements         ND m       Image: Container requirements       Image: Container requirements         Observations/Notes:       Image: Container       Image: Container         Pump Start Time: NA       VOC Reading:       Image: Container         Nom Depth: NA       Sample /Time: NA       Image: Container         Signature(s):       Image: Container       Image: Container         MSMSD       NA       Image: Container         Signature(s):       Image: Container       Image: Container         Mode: Container       Image: Container       Image: Container         MSMSD       NA       Image: Co												
Sample information: method, container number, size, and type, preservative used.         Analysis       Preservative       Container requirements       No-of containers         Observations/Notes:												
Sample Information interior, original type, preservative dised.     Container requirements     No-of containers       Analysis     Preservative     Container requirements     No-of containers       Observations/Notes:     Image: Container requirements     Image: Container requirements     Image: Container requirements       Pump Start Time:     VA     VOC Reading:     UNAGUE TO RECTURE     Recomparison       Sample /Time:     Ma     Image: Container requirements     Image: Container requirements       MS/MSD     NA     Image: Container requirements     Image: Contai	Sample inf	formation:	motho	d containa	r numbor sizo	and type pro	e convetivo uco					
Analysis     Treservative     Container requirements       No. or container requirements     NO. or containers       No. or container     No. or containers       No. or container     No. or containers       No. or containers     No. or containers       No. or container     No. or containers	Sample in	ionnation.	Anal	veie	number, size,	Droso	rvativo	eu.	Container requirer	nonte	No of containers	
WA     Image: Signature(s):			Alla	y 515		11636	Ivalive			nents		
Observations/Notes:     UNAGUE TO DETRESSE GROUNDWATEN       Pump Start Time: NA     VOC Reading:       Pump Depth: NA     Sample /Time: NA       Sample /Time: NA     Duplicate ID No.: NA       Signature(s):     Signature(s):		1										
Observations/Notes:       Pump Start Time:       Pump Depth:       NA       Sample /Time:       NA       Duplicate ID No.:       MS/MSD       NA       Duplicate ID No.:       MA		A	F	)								
Observations/Notes: Pump Start Time: NA VOC Reading: UNNEVE TO RETREEVE CROWNWATEN Pump Depth: NA Sample /Time: NA MS/MSD NA Duplicate ID No.: MA Signature(s):												
Observations/Notes:     UNABLE TO RETREET GROWTOWATEN       Pump Start Time:     NA       Pump Depth:     NA       Sample /Time:     NA       MS/MSD     NA       Signature(s):     Duplicate ID No.:												
Observations/Notes:       Pump Start Time:       Pump Depth:       NA       Sample /Time:       NA       Duplicate ID No.:       NA												
Observations/Notes: Pump Start Time: NA Pump Depth: NA Sample /Time: NA MS/MSD NA Signature(s): MNAGUE TO REATHER & CROWDWATCH UNAGUE TO REATHER & CROWDWATCH M BARREN M BARREN MA												
Pump Start Time: NA VOC Reading: UNNBUE TO RETREELE GREUNPUNDTEN Pump Depth: NA Sample /Time: NA MS/MSD NA Signature(s): MA MS/MSD NA MS/MSD NA MS	Observatio	ons/Notes:										
Pump Depth: NA Sample /Time: NA MS/MSD NA Signature(s): MS/MSD NA MS/MSD NA Signature(s): MS/MSD NA MS/MSD NA MS			n					UNABU	E TU 125	TREELE .	5 ROUN-PURATEN	
Pump Depth: N72- Sample /Time: N D MS/MSD NA Duplicate ID No.: MA Signature(s): Construction of the second sec	Pump Sta	rt Time: 🕨	)F		- ,	VOC Readin	ig:	w/ Bu	PELEL		andari and i daaraan ing kabalan germanika daaraan kabang kabalari kabang kabalan kabang kabalan kabang kabang 1 - 1	
Sample /Time: ND MS/MSD NA Signature(s): Control MA Signature(s): Control MA Control MA Signature(s): Control MA Control								- (				
Sample /Time: ND MS/MSD NA Signature(s): Control of the second se	Pump Dep	oth: Nr										
MS/MSD NA Duplicate ID No.: MA Signature(s):	Sample /T	ime N	A	_								
Signature(s):	MS/MSD	N)	2			Duplicate ID	NO.: MA	-				
and R	Signature(	s):		A	,							
an etty		-		110	7/							
2m J		-	e	TK	X							
	$\mathcal{L}$	la	2	× 1	)							
				X								
				0								

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# P) 1/1

				GROUNDW	ATER SAMP	LING DATA	SHEET		And the second second
Client:		NAVFAC		Proj	ect Number:	67958	10.09.FI.L	vs	11
Location:	OLF COU	PEUZIC	F	_	Well ID:	WI-CL	1- tong	MUNIZE	> ( 3/1/17
Event: n	5Ph DVL	ow sam	MIENG 2	017	Sample ID:	WI.C	V-GWIZI	0-0317	• 1
Date:	3/1/2017		_	San	npling Team:	Encos	A BIDLY	a P.C	
Weather:	40° 1,000	news T		_					
Total Dept	h: /	97.6	FT.(BTOC)			Me	easuring Device:	HANTBOX U	-22
Depth to w	vater: (-)	160.82	FT.(BTOC)			2000	Date and Time:	al zh	112
Water Colu	umn:	36.78	FT. Í					Po	
	(x	0.163	GAL/FT.			Well Dia.	Volume	7/12	
Well Volur	ne:	6 GAL	GAL.			(inches)	(gallons/foot)		
<b>Total Purg</b>	je Vol.:	1.8	GAL.			1	0.041		
			-			1.25	0.064		
Purge Dev	rice: BESS	T PANA	REA ZOU		-7	2	0.163		
						4	0.653		
	1	1			SAMPLE	DATA			
Date: 3	2017	Temp.	Cond.	DO	pH	ORP	Turbidity	Other: DTw	Color / Odor / Comments
Time: ∖⊰	545	°C	mS/cm	mg/L	SU	mV	NIU	1 bter	
Method:	KUME		0.01						
					FIELD PARA	METERS	-		
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU <i>©</i> ،۱	ORP mV	Turbidity NTU	Other:	Color / Odor / Comments
1545	\$00ml	11.42	0.595	3.68	5,92	-84	58.9	160.85	1
1550	1.25L	11.15	0.574	2.28	6.22	-121	63.9	160,85	PUM ABATIERY DEG
1600	1.50L	10,69	0.575	1,95	6.68	-135	58.1	160.85	PUMP ON
1605	2.25-6	10.84	0.571	1.55	6,70	-138	18:2	160.87	CLEAN, COUNLIES)
1610	3.06	10.96	6.569	1.71	674	-135	23.4	+6-901609	003/17
1615	1GAL	10,95	0,569	1,63	6,79	-135	22.2	160,90	
1620	STIPEL	10.86	0,568	1.60	6.85	-133	27.1	160.90	
1625	5.25	10,84	0.569	1.61	6.86	-131	29.0	160.92	
1630	4.0L	10.67	0,569	1,58	6,89	-129	26,6	160.92	*
1635	6.75L	10,73	0,569	1.48	6,90	-128	11.3	160,92	PUMP 6H
Comple inf	a waa a ti'a aa a waa a tia								
Sample Info	ormation: meth	od, containei	r number, size	, and type, pro	eservative us	ed.	De estados en un en cluso		No. of combain one
7-	Alle			Prese		(	Jontainer requirer	nents	No. of containers
10+0	- USTERN.	+ 531	avie is	ACR	-	(25	m1 (401	A2-	1
							- A		
Observatio	ns/Notes: 10	0 - 110	PSI M	2-15 Sec	- dische	71 /30 Se	e recharge	2250 ml/	min
Pump Star	rt Time: 1 5-4	5		VOC Readin	ig: 0.0 j	pro			
Pump Dep	th: 1901 b	toc boff	omet-pun	v					
Sample /Ti	ime: 1650	U IN	I - cu	-GWI	20-0	317	MSMSD		
MS/MSD 🗸	NI-W-G	W12D-0	317 (msinsi	puplicate ID	No .: NA	۲			
Signature(s	s):								
/.		A Z	AG						
	2		010						

# ch2m:

**GROUNDWATER SAMPLING DATA SHEET** Client: NAVFAC Project Number: 679580,09. FI. WS Location: OLF COUPEVELLE Well ID: WI-CU-MWOUS Event: SPRING 2017 GU SAMPLING Sample ID: WIZ-CV-BW045-0317 Sampling Team: Evos A. Bityon Date: 2/28/17 RG Weather: 30-40'S, ROENY, WINDY Total Depth: FT.(BTOC) 126.60 Measuring Device: HONTERAUNZZ Depth to water: FT.(BTOC) Date and Time: 3/1/17 1410 (-) 106.40 Water Column: 20:2 FT. Well Dia. Volume (X) 0.163 GAL/FT. Well Volume: 3.3 GAL. (inches) (gallons/foot) Total Purge Vol.: 10 GAL. 1 0.041 1.25 0.064 BESST PANACEA 200 Purge Device: (2) 0.163 4 0.653 SAMPLE DATA Cond. DO Temp. ORP Date: 2/28/17 pH Turbidity Other: Drw Color / Odor / Comments °C mS/cm SU Time: 1410 ma/L mV NTU 16th Method: Volumiz FIELD PARAMETERS Purge Vol. Temp. Cond. DO pH ORP Turbidity Time Other: Drw Color / Odor / Comments °C SU (gals) mS/cm mg/L mV NTU 7.62 11.60 7.52 46.1 107.1 1410 0.5 0.476 146 7.15 1420 10.99 0.491 7.52 153 361 1 108.2 2 1430 7.10 7.52 42.1 ATIZINCINE, JOLEN 10.68 0,479 157 111.0 3 1440 0.481 6.95 7.57 40.9 PUMPNOTFULLY RECHAN 10.59 15-8 111.5 TM 4 11.89 STOP/CLEANAUMP/LOWE 1450 10.54 0,494 746 162 38.1 112.0 AIR/LITLE WATER 4.5 6945 12.38 0.695 5.68 5.74 239 1.6 108.1 1000 5 11.45 0.684 5,85 5.85 241 10.1 109.2 MOSTLY ADK 5.5 0,585 5-989.71 258 6.3 1015 11.21 5.98 111.9 12.1 115,11 1305 10.98 6,55 202 0,485 11.06 10 Sample information: method, container number, size, and type, preservative used. Analysis Preservative Container requirements No. of containers PEC 537/mon 125 2 USEPA TCE mI HOPE Observations/Notes: 65-75 PS; PUMP INITIALLY @ 117' bloc moved to 125' to assist ul Pump Start Time: 2/25/10 1410 VOC Reading: al X 50 ml/min ppm well head Pump Depth: 125-1 bte bitte most pump Sample /Time: 3/1/2017 1325 WI-CV-GW045-0317 MS/MSD NA Duplicate ID No .: VWI - CU - MWO4SP - 0317 Signature(s):

F9 1



Location: DLF COUPEUTICE

Client:

Event:

MS

GROUND	WATER	SAMPLING	DATA	SHEET

<b>Project Number:</b>	679580.09.FI. WS
Well ID:	WI- CU-MWOHM
Sample ID:	WI-W-GWOUM-0217
Sampling Team:	Eves A. Biller P.G
	1

Date: 2/24/17 Weather: 40°S, RAINY, SNOWY, DEY **Total Depth:** FT.(BTOC) 158.70 Depth to water: (-) 123.43 FT.(BTOC) Water Column: 35.27 FT. GAL/FT. (X) 0.163 Well Volume: GAL. 5.74 **Total Purge Vol.:** 18 GAL.

NAVFAC

FEB 2017 ON SAMPENO

Measuring Device: HONIBA, U-22,1 Date and Time: 2/24/17

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

Purge Device: BESST PANACEA 200 ul 6' 11/2" VOLUME BOOSTER

1	1 1				SAMPLE	DATA			
Date: 2/	24/17	Temp.	Cond.	DO	pН	ORP	Turbidity	Othor: OThe	Color / Odor / Commonto
Time: 🍐	010	°C	mS/cm	mg/L	SU	mV	NTU	16400	Color / Comments
Method:	ver Fluid Volumiz								
					FIELD PAR	METERS			
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: p7w	Color / Odor / Comments
1010	100 m/	6.14	0.574	8.95	5.99	126	71000	124.5	DANKENISY, ODONLESS
1020	200ml	7.82	0.438	2.36	7.94	-140	71000	125.1	
1030	Bound	7.60	0.447	1.16	9.99	-191	71000	126.2	
1040	1.5-L	8.02	0.427	1.54	8.40	-206	>1000	126.5	
1050	1GAL	9.07	0.434	9.68	8.64	-116	21000	126.1	AIR BORDES IN LIN
1100	52	9.00	0.427	16.64	8.61	-99	>1000	126.5	
1110	5.52	8.96	0-425	11.96	8.72	-80	71000	126.1	v
1120	6.02	7.98	0.430	1.51	8.71	-224	71600	125.7	
1130	6.12	F.12	0.437	3.98	8.69	716	71000	125.5	
1140	6.52	7.58	0.430	1.5%	8.71	-224	71000	125.0	PUMPNOT PRUDETNUL
1350	6.75L	9.35	0.357	8.14	8.45	-89	984	123.6	RIZIALACEN FILTER
Sample in	formation: metho	od, container	number, size	, and type, p	reservative us	sed.			VOLUME DOOST
	Ana	lysis		Pres	ervative		Container require	ements	No. of containers
								,	
Observatio	ons/Notes:	s- psi	70-40	sec /	ma	discha	1 he chus.	al volvom	buest
		, .	1077-0040 U A			1	i reaction	1	
Pump Sta	art Time: 02/2	uly 100	G	VOC Readi	ng: 0,0 00	n	C	07	
			1975) 1		. vell	het	Jack	19 2.	6
Pump De	pth:				- (			,	
A 18	π.(		11						
Sample /1	Time: 10	00 2	2/25-17	1 WI	- 64 - 6	smoun-	-6217		
MS/MSD	NA		· · · · · · · · · · · · · · · · · · ·	Duplicate ID	No.: NA	+			
Signature	(s):	1.		1					
	<u></u>	10	101	/					
/	//	IL H	~ W.O						
6	~ 8	$\mathcal{N}$							



Location: OLF COUPEVELLE

2/24/1

### **GROUNDWATER SAMPLING DATA SHEET**

Project Number:	679580,09. FI.WS
Well ID:	WI- W- MWOYM
Sample ID:	WI-CU-GWOYM-0217
Sampling Team:	Enus A. Bilger R.G

Weather: 40% NA INY. Total Depth: 158.70 FT.(BTOC) Depth to water: (-) 123.43 FT.(BTOC) 35.27 Water Column: FT. (x) 0.163 GAL/FT. Well Volume: 5.74 GAL. Total Purge Vol.: 18 GAL.

NAVFAC

FEB ZO 17 GW SAMPLING

Measuring Device: Hor, hon, U-22 Date and Time: 2/24/17

pg

2/2

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
0	0.163
4	0.653

2/25/ 2/25 Client:

Event:

Date:

Purge Device: BESST PANACIEA 200 m/ G' 1/2" Volume booster

					SAMPLE	DATA			
Date: 2/	24/17	Temp.	Cond.	DO	pH	ORP	Turbidity	Other: Dra	Color / Odor / Comments
Time: 24	WU FIECT	- ⁰ C	mS/cm	mg/L	SU	mV	NTU	1 btoc	
Method:	IOLINE							10	
					FIELD PARA	METERS			
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTw	Color / Odor / Comments
1400	2	11.08	0.395	1.14	8.44	-263	930	125.1	
1410	3	11.28	0.392	0.80	8.46	-275	836	127.2	
1420	4	11.27	0.393	6.69	8.47	-283	810	179.1	
1430	5	11.67	0.387	6.74	8.43	-278	712	129.5	
1440	6	11.79	0.382	1.88	8.38	-230	373	129.6	CLEAN, ODORL RSS
1450	7.5	11.06	0.372	2.69	8.25	-169	116	129.9	
1500	5.5	11.12	0. 368	5.65	8.24	-171	94.2	128.2	
1510	10	11.12	0.371	5.12	8.25	- 162	93.1	125.2	
1520	11								FILTER GLOGGED NO
0900	15	1014	0.382	8.35	8.35	-167	76-2	128.5	
0930	18	10.96	6.387	8.31	8.31	-157	26.7	128,9	FILTER GLOGORD, NIN
Sample inf	ormation: meth	od, container	number, size,	, and type, pr	eservative us	ed.	an a	125.6	
	Ana	alysis		Prese	rvative	(	Container require	ements	No. of containers
PFC	USEPA	577/m	00	ICE	2	150	ml H	DDIZ	. 2
					, ,		,		
Observatio	ns/Notes:	15 PSI	, 30-40	Sec dis	days /11	nin reche	age al vo	ume Buost	En. 24 volumic
		1 - 101	-		Boo	IJTEN h	NAG GET	LODGED, A	ECOMEND 11/2" R
Pump Sta	rt Time: $2/24$	1107 1011		VOC Readin	ng: BIN DE	thed	Terici	. 1	E ETITEN BUS
Bump Dor	the long		hellence	pu-p	ep n		Lin	NI STOR	VENTENC
Fump Dep	155	Diec	En ticto -of					12Ectta	2012,
	ample Time: 1000 WI-CU-GWOYM-0217 UNABLE TO STUDE								
Sample /T				Duplicato ID	Nouto				
Sample /T MS/MSD	NA			Duplicate ID	Non NY				
Sample /T MS/MSD Signature(:	NA 5):	1	21						
Sample /T MS/MSD Signature(:	NA s):	1	31 R.					7	



27 1/4

Client: Location: Event:	OLF COUR	NAVFAC		- Pro -	oject Number: Well ID:	67958 NI-0	0.09. FI. V	NS	51				
Location: Event: F Date:	EB 2012	DEUTUE	·	-	Well ID:	WI-C	J-MWOST	Λ					
Event: F Date:	元B 2002 (	-		Well ID: WI-CU-MWOSM									
Date:	1 1	SW SAMP	PLING	-	Sampling Team: $\Box = \Box $								
Weether	2/22/17	<del>.</del>	Sai	mpling Team	Ers Bilyer P.G								
weather:	40°S, are	REPST		-	HENON Pion un alicin								
Total Dept	:h: <u>1</u> -	75.0	FT.(BTOC)			M	easuring Device:	YSI GOU H	Acit TUNBINIEMETER				
Depth to w	vater: (-)	1123.65	FT.(BTOC)				Date and Time:	2/23/17	1215				
Water Col	umn:	51.35	FT.			<b></b>	1	1					
	<u>(x</u>	)0.163	GAL/FT.			Well Dia.	Volume						
Well Volur	ne: <u>8</u>	3.4	GAL.			(inches)	(gallons/foot)	-					
Total Purg	e vol.: _/	5	_GAL.			1	0.041	4					
	ina Bre	- DALLA		7.		1.25	0.064	-					
Purge Dev	Ice: Dess	T PACA	424 20	0	-		0.163	-					
						4	0.055	]					
					SAMPLE	DATA							
Date: Z	22/17	Temp.	Cond.	DO	pН	ORP	Turbidity	Others Dirige	Calar / Odar / Command				
Time: 12	-15	°C	mS/cm	mg/L	SU	mV	NTU	1 byter					
Method:	rflum												
					FIELD PARA	METERS							
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments				
1245	0	10,19	0,366	10.94	8.57	185.4	71000	123.6	OBTHINING RUMPSER				
1220	0.1	10,70	0.359	9.98	8.54	184,6	>1000	123.6	aller com (1NOO)				
1225	0.5	10,60	0,364	9.47	8.54	185.3	71000	123.6	(				
1230	0,9	10.79	0.364	9.5%	8.54	186,2	286	123.6					
1235	1.2	11.09	0.368	9.50	8.54	186.3	316	1236					
1240	1.6	10.50	0,360	\$93	8.55	188.5	Zýeg	123.6					
1245	2.0	10.55	0.357	9.06	5.55	188,4	256	123.6	/				
1250	2.4	10.56	0,360	8.74	8,56	188.3	432	123.4					
1255	2.8	10.65	0.343	8.64	8.55	189.7	425	123.6					
1300	3.6	10.51	0,362	8.37	8.51	181.6	416	123.6	ų.				
1305 Sample inf	ormation: meth	11. 2/	Di SG Z	9,20	S.SC.	190.1 od	912	123.6					
Sample init	An:	alvsis	number, size	Prese	ervative		Container requirer	ments	No. of containers				
Reci	KERA C	sz/mod		11000		150	+ 1 Hbe		7				
TFCU	DEPH J.			Ja		1,0	AL HUF	12	6-				
Ohaam	no/Nictor	1			,			0 1					
Observatio	no/noles.	20 Sec /20	Sec 9	Scharge	rechery	- 0	45 psi	C 7 3	100 n / MIL				
Pump Star	rt Time: /2/	5		VOC Readi	ng: O,Op	m							
Dume Der	the least of	2	1004816 1004816		wellher	2							
Pump Dep	u: 165 E	O MOTTO	FRMP		COL	IBCT	WI-CV-	-GNOSM	-0217				
Sample /T	ime:			15	45	Den	PFC ISED	1 5 m	hand				
Jampie / T	LIN.				No: . 1 Pre	FUIL	I C VORF		1.0C				
MS/MSD	Nha	-		Duplicate ID	10.1 p 13								
MS/MSD Signature(s	5):	-4	$\mathcal{P}$										
MS/MSD Signature(s	s):	Ħ	R/ (	26	-								



# 15 2/4

Client:	NAVFAC									
Location: GLEC	GLF COUPENTLLE									
Event: FEB 2	FEB2017 ON SAMPLING									
Date: 2/23/1	7									
Weather: 305, S.	Jowy, RAI	54								
Total Depth:	175.0	FT.(BTOC)								
Depth to water:	(-) 123.65	FT.(BTOC)								
Water Column:	51,35	FT.								
	(x) 0,163	GAL/FT.								
Well Volume:	8.4	GAL.								
Total Purge Vol.:	15	GAL.								

### GROUNDWATER SAMPLING DATA SHEET

<b>Project Number:</b>	679580,09.FJ,WS
Well ID:	WI-W-MWOSM
Sample ID:	WI-CU-GWOSM
Sampling Team:	Ers A. Bilyeu P.G

HEIZON Pieziometriz meder Measuring Device: YSI GOO, HACHTURISTOTMETER Date and Time: 2/23/17 1215

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

Purge Device: BESIT IPANACEA 200

					SAMPLE	DATA			
Date:		Temp.	Cond.	DO	pН	ORP	Turbidity	Othor: Dta	Color / Odor / Commonto
Time:		°C	mS/cm	mg/L	SU	mV	NTU	1 btre	Color / Odor / Comments
Method:									
					FIELD PARA	METERS			
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: 1976	Color / Odor / Comments
1310	4.0	11,47	0.364	9,18	8,56	189.3	425	123.6	GIZIEY, CLOUDYNO 000
1315	4.4	11,32	0.364	9.72	8.55-	109.7	430		1
1320	4.8	11,23	0.348	9.00	8.56	190.1	379		
1325	5.2	10.93	0.362	9,92	8.55	190.5	401		
1336	5.6	11.05-	0,342	10.18	8.53	192,9	257		
1335	6.0	10.92	0.362	9,75-	5.55	191.4	245		
1340	6.4	11.00	0.357	9.62	8.55	191,9	236		
1345-	6.8	10.99	0.35-8	9.35	8.55	191.4	240		
1350	7.2	10,99	0.358	9.36	8.54	191.2	225	1	
1355	7.6	10.99	0.358	9.25	8.54	19.1.3	214		
1400	8.0	10.98	0.35-9	9,12	8.53	192.3	205	W	¢
Sample info	ormation: meth	od, containe	r number, size	, and type, p	reservative us	sed.			
	Ana	alysis		Prese	ervative		Container require	ements	No. of containers
	602	PARB	2						
c	>1212	Property							
			-31.07						
Observation	ns/Notes:								
Pump Star	t Time:			VOC Readi	ng:				
			7 01						
Pump Dept	th:	SEF	Z PA	212	4				44.
Sample /Ti	me:								
MS/MSD	NA			Duplicate ID	No.:NA				
Signature(s	):	1							
/		D	_ R	100					
C	7~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	- OF	x	/ #40					



 $\bigcirc$ 

# P9 3/4

lient: NATRAC NOTE: NATRAC Project Number: $C_{MS} C_{M} (C_{M}, C_{M}) (M)$ vent: $C_{MS} C_{M} (C_{M}) ($		GROUNDWATER SAMPLING DATA SHEET											
cetator: $G_{LC} = C_{LC} - M_{CL} SM_{LC}$ Well D: $M_{LC} = C_{LC} - M_{CL} SM_{LC}$ Sample D: $M_{LC} = C_{LC} - M_{LC} SM_{LC}$ Sample D: $M_{LC} = C_{LC} - M_{LC} SM_{LC}$ Sample D: $M_{LC} = M_{LC} - M_{L$	Client:		NAVFAC		Pro	Project Number: GTSTEV OG, FI . US							
Sample D: $MT = CU - CW SM + CLT         Sample D: MT = CU - CW SM + CLT         Pather: \frac{2}{3}(L_1, S, MT)         Data of the set of $	Location:	OLF- Cour	EVILLI	2	_	Well ID: WII - CU - MWOSTM							
ate: $2/23/17$ Pather: $3(t)$ , $5(t)$ , $5(t)$ pather: $3(t)$ , $5(t)$ , $5(t)$ pather: $175, 0$ pather: $175, 0$ pather: $175, 0$ pather: $175, 0$ pather: $115, 0$ pather: $115, 0$ pather: $5(t)$ , $25, 5$ pather:	Event:	EEB 2017	Gw SA	MPLINC		Sample ID: WI - CU - GW USM - 6217							
learther: $\frac{2}{3} \frac{1}{\sqrt{3}} $	Date:	2/23/17		_	Sar	Sampling Team: For A. Bitum P.G.							
otal Depti: $175 \cup FT(BTOC)$ teptih water: $175 \cup FT(BTOC)$ tater Colum: $57, 75 \in FT$ . tel Volume: $9, 4$ GAL. $157, 85 \in FT$ . tel Volume: $9, 4$ GAL. 152, 6A. 152, 7A. 152, 7A. 15	Weather:	30's, SWW	7		-			.1					
apply to water:       OPEN PT (BTOC)         Date and Time: 2 ( $2,3$ ( $1,7,1,7,7,7,7,7,7,7,7,7,7,7,7,7,7,7,7,7$	Total Dept	th: i-	50	FT.(BTOC)			Me	easuring Device:	YOT	HEIZ	ON Piezro metric me		
Atter Column:       Str 25 r ft.       Model of the stress of th	Depth to v	vater: (-)	123.65	FT.(BTOC)				Date and Time:	2/2	3/12	12 11 TOLISE DILME 1150		
(a) $0.1/23$ CALFT.         Well Dia (galonafoot)         1       0.041         1.25       0.064         2.75       CAL         1.1       0.041         1.25       0.064         2.0       2.0         2.15       Color / Odor / Comments         4       0.633         2.15       PLow Form         2.15       Color / Odor / Comments         1.1       0.053         2.15       PLow Form         2.15       Color / Odor / Comments         1.10       0.01         1.11       0.041         1.125       0.064         2.15       Color / Odor / Comments         1.10       0.564       9.72         1.10       0.570       0.770       0.70         1.10       0.524       9.72       8.70       2.00.1         1.11       0.570       0.770       0.777       Color / Odor / Comments         1.125       1.11/4       0.570       0.770       2.62/7       2.71         1.11/4       0.570       0.770       0.777       2.60/7       1.74       1.74         1.25       1.11/4	Water Col	umn:	51.35	_FT						117	1200		
Velt Vol:       9.4       GAL.       (inches)       (gallomsfoot)         otal Purge Vol:       15       GAL.       1.0041         urge Device:       Brss       Dawler Care       Duo         ate:       2/25       Duo       A       0.663         ate:       2/25       Temp.       Cond.       D       PH         ime:       2/21       Temp.       Cond.       D       PH       Turbidity         ime:       2/21       Temp.       Cond.       DO       PH       NTU       Other:       DTV         ime:       2/21       Temp.       Cond.       DO       PH       ORP       Turbidity       Other:       DTV       Color / Odor / Comments         into:       rc       mS/cm       mgl.       SU       mV       NTU       Other:       DTV       Color / Odor / Comments         into:       Kg8       11.0L       0.564       9.72       8.50       2000.1       1192       12.5.0       Galery / Color / Odor / Comments         into:       Kg8       11.0L       0.569       9.77       8.457       2102.1       12.5       Galery / Color / Odor / Comments         into:       Kg8       11.62       0.565		(x)	0.163	GAL/FT.			Well Dia.	Volume	]				
1       0.041         urge Device:       BFSST       PDNFCSA       200         SAMPLE DATA         ate:       JSST       PDNFCSA       200         SAMPLE DATA         ate:       JSST       PDNFCSA       200         SAMPLE DATA         Turge Device:       BFSST       PDNFCSA       200         SAMPLE DATA         Turge JSST       PDNFCSA       200         FIELD PARAMETERS         TIME (2011" Temp.       Cond.       DO       PH       OPP       Turbidity       Other:       DTC         IVES & 49 411.10       0.510       Y-02       8.94       11.65       0.526       9.72       8.50       200.11       192       12.5.0       6007 / Comments         IVES & 49 411.05       0.526       9.77       8.50       200.11       192       12.5       174       192       1.145       0.007.7       0.007 / Comments         IVES & 49 411.05       0.526       9.77       8.50       174       12.5       12.5       12.5       12.5       12.5       12.5       12.5       12.5       12.5       12.5 <td>Well Volur</td> <td>me:</td> <td>9.4</td> <td>GAL.</td> <td></td> <td></td> <td>(inches)</td> <td>(gallons/foot)</td> <td></td> <td></td> <td></td>	Well Volur	me:	9.4	GAL.			(inches)	(gallons/foot)					
urge Device: $B_{TYS}$ $PDurcerr       200         ate:       2/25/r^2       Temp.       Cond.       DO       pH       OPP       Turbidity       Other:       pTtv       Color / Odor / Comments         ime:       2/21/r^2       Temp.       Cond.       DO       pH       OPP       Turbidity       Other:       pTtv       Color / Odor / Comments         ime:       2/21/r^2       Temp.       Cond.       DO       pH       OPP       Turbidity       Other:       pTtv       Color / Odor / Comments         iethod:       Werk       FELD PARAMETERS       Turbidity       Other:       DTtv       Other:       DTtv       Odor / Odor / Comments         1405       &       II.I.C.       0.564       9.72       &       S.v DO MV       NTU       MV	Total Purg	ge Vol.:	15-	GAL.			1	0.041					
Urge Device:       BTSST       PRAFECTA       200         SAMPLE DATA         all 2 Z Z I Z         Temp.       Cond.       D0       pH       ORP       Turbidity       Other: pTCV       Color / Odor / Comments         Imm: Z217       Temp.       Cond.       D0       pH       ORP       Turbidity       Other: pTCV       Color / Odor / Comments         Imm: Purge Vol.       Temp.       Cond.       D0       pH       ORP       Turbidity       Other: pTCV       Color / Odor / Comments         Imm: Purge Vol.       Temp.       Cond.       D0       pH       ORP       Turbidity       Other: pTCV       Color / Odor / Comments         Imm: Purge Vol.       Temp.       Cond.       D0       pH       ORP       Turbidity       Other: pTCV       Color / Odor / Comments         Imm: Vol. QC # PL       20       D       D       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q       Q							1.25	0.064	- 25				
4         0.683           SAMPLE DATA           ate: 2/25/2           "C         Do         PH         ORP         Turbidity         Other: pr/c         Color / Odor / Comments           remp.         Cond.         DO         PH         ORP         Turbidity         Other: pr/c         Color / Odor / Comments           relation: """           Time (page Vol.         Odor / Odor / Odor / Comments           ""         Purge Vol.         Odor / Odor / Odor / Comments           ""         Time (page Vol.         Odor / Odor / Odor / Comments           ""         Time (page Vol.         Odor / Odor / Comments           ""         Time (page Vol.         Odor / Odor / Comments           ""         Time (page Vol.         Odor / Odor / Comments           "         Odor / Odor / Comments           Udo         Odor / Odor / Odor / Co	Purge Dev	vice: Brassi	- PANY	CIEA 2	00	_ *	(2	0.163					
SAMPLE DATA           att: 2/25/r2         Temp.         Cond.         DO         pH         ORP         Turbidity         Other: DTV         Color / Odor / Comments           Interview recomments           Interview recomments           TIME Purge Vol.         Temp.         Cond.         DO         pH ORP         Turbidity         Other: DTV         Color / Odor / Comments           Interview Vol.         Temp.         Cond.         DO         PH ORP         Turbidity         Other: DTV         Color / Odor / Comments           Interview Vol.         Temp.         Cond.         DO           Interview Vol.         Turbidity         Other: DTV         Color / Odor / Comments           Imterview Vol.         Set U1.         Color / Odor / Comments           Imterview Vol.         Other: DTV         Color / Odor / Comments           Imterview Vol.         Other / 12.5         Color / Odor / Odor / Comments           Imterview Vol.         Other							4	0.653	]				
JAMPLE DATA         Temp.       Cond.       DOPH       Turbidity       Other: Driv       Color / Odor / Comments         Imp.       Cond.       DOPH       Turbidity       Other: Driv       Color / Odor / Comments         Time       Purge Vol.       Temp.       Color / Odor / Comments         IVED PARAMETERS         Time (gals)       °C       mSicm       mg/L       SU       MV       NTU       Other: Driv       Color / Odor / Comments         IVED PARAMETERS         Time (gals)       °C       mSicm       mg/L       Other: Driv       Other: Driv       Color / Odor / Comments         IVED PARAMETERS         Time (gals)       °C       MSicm       PTE       Color / Odor / Comments         IVED PARAMETERS         IVED PARAMETERS         IVED PARAMETERS         IVED PARAMETERS         IVED PARAMETERS					Status Vina	SAMPLE							
Image: ////  image: ////  image: //// image: ///// image: ///// image: ///// image: ////////////////////////////////////	Date: 2/	12/1-	Temp	Cond				Turbidity					
FIELD PARAMETERS         FIELD PARAMETERS         Time Purge Vol.       Temp.       Cond.       DO       pH       ORP       Turbidity       Other:       DTW       Color / Odor / Comments         1405:       & Y       11.1.1.       0.5.6.4       9.77.2       8.5.0       200.1       142.7       23.6       62.6.4', Currany, Nuccov         4105:       & Y       11.1.1.0       0.5.6.4       9.77.2       8.5.0       200.1       142.7       23.6       62.6.4', Currany, Nuccov         4125:       9.2       11.1.4       0.51.1       9.62.8       9.4.7       20.6.2       17.4       142.7       142.7       17.4       142.7       142.7       142.7       17.4       142.7       17.4       142.7       142.7       142.7       142.7       142.7       142.7       142.7       142.7       142.7       142.7       142.7       142.7       142.7       143.5       16.7       143.5       16.7       143.5       16.7       144.7       143.5       16.7       144.7       143.5       16.7       144.7       14.5       14.5       14.5       14.5       14.5       14.5       14.5       14.5       14.5       14.5       14.5       14.5 <td>Time: 12</td> <td>15</td> <td>°C</td> <td>mS/cm</td> <td>mg/L</td> <td>SU</td> <td>mV</td> <td>NTU</td> <td>Other</td> <td>prw</td> <td>Color / Odor / Comments</td>	Time: 12	15	°C	mS/cm	mg/L	SU	mV	NTU	Other	prw	Color / Odor / Comments		
FIELD PARAMETERS           Time         Purge Vol.         Temp.         Cond.         DO         pH         ORP         Turbidity         Other:         DTL         Viber           V405"         & Y         11.1L         0.5C4P         9.72         & Sco         ZOO.1         1.42         12.3.L         GBEY; CLUMPY, NEUV           V40         & B         11.C5         0.5C4P         9.72         & Sco         ZOO.1         1.42         12.3.L         GBEY; CLUMPY, NEUV; V           V40         & B         11.C5         0.5C4P         9.72         & Sco         ZOO.1         1.42         12.3.L         GBEY; CLUMPY, NEUV; V           V40         & B         11.C5         0.32C9         9.57         & & & & & & & & & & & & & & & & & & &	Method: La	ow Feor											
Time         Purge Vol. (gals)         Temp. °C         Cond. mS/cm         DO mg/L         PH SU         ORP         Turbidity NTU         One: (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/ (bbc/	method.					FIELD PARA	METERS						
Imme         (gals)         °C         mS/cm         mgL         SU         mV         NTU         NTU         Other: []         Color / Comments           14/65         & 4/4         11.1/L         0.5/26         9.772         8.50         200.1         14.72         12.3.2         6.825/7, 62.9377, 70.0007         70.62         8.49         11.14         0.371         9.62         8.49         11.14         0.371         9.62         8.49         11.14         0.371         9.62         8.49         11.14         0.371         9.62         8.49         11.62         12.5.0         6.825/7, 62.9377, 70.00         12.6         12.6         12.3.0         12.6         12.5.0         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6         12.6		Purge Vol.	Temp.	Cond.	DO	DH	ORP	Turbidity		~			
1405*       Q. 4       11.1L       0.56Q       9.72       8.50       200.1       142       123.L       6254, current, NEON         41.0       8.8       11.67       0.572       9.62       8.49       2.17.1       206       174         41.0       8.8       11.67       0.571       9.62       8.49       2.16.5*       174       14         41.0       0.311       9.62       8.49       2.16.5*       174       14       14         41.0       0.311       9.62       8.49       2.16.5*       174       14       14         41.0       0.369       9.77       8.45       2.05.5*       1455       14       14         41.0       0.360       10.26       9.42       200.5*       145       14       14         41.0       11.72       0.360       10.75       9.46       175.7       16.7       16.7       14       14       14       14       14       14       14       15.8       16.2       16.7       16.7       16.7       16.7       16.7       16.7       16.7       16.7       16.7       16.7       16.7       16.7       16.7       16.7       16.7       16.7       16.7	Time	(gals)	°C	mS/cm	mg/L	SU	mV	NTU	Other	: DIW	Color / Odor / Comments		
4/10       \$\begin{aligned}circle{2}{8}\$ 11.65       \$\begin{aligned}circle{2}{8}\$ 2.1.1       \$\begin{aligned}circle{2}{8}{8}\$ 2.1.1       \$\begin{aligned}circle{2}{8}{8}{11.5.5}\$ 2.1.1       \$\begin{aligned}circle{2}{8}{8}{11.5.5}\$ 2.1.1       \$\begin{aligned}circle{2}{8}{8}{11.5.5}\$ 2.1.1       \$\begin{aligned}circle{2}{8}{11.5.5}\$ 2.1.1       \$\begin{aligned}cir	1405	84	11.16	0.369	9.72	8,50	200.1	192	123	.6	GREY, CLOUDY, NO COST		
9.2       11.14       0.371       ¥.02       ¥.49       216.5       174         126       9.6       11.36       0.369       9.57       £.45       20.72       165       1         1425       9.7       11.62       0.369       9.57       £.45       20.75       187       1         1425       9.7       0.369       10.26       8.42       200.55       187       1         1430       10       11.72       0.369       10.26       8.42       200.55       167       1         1430       10       11.72       0.360       10.75       \$.427       183.57       162       1         1435       11.32       6.411       10.40       \$.427       183.57       162       1       1         1455       11.2       11.32       0.370       9.54       \$.457       181.47       122       1       1         1455       11.12       0.370       9.54       \$.457       181.47       122       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1 <td>1410</td> <td>8.8</td> <td>11.05</td> <td>0:370</td> <td>9.02</td> <td>8.49</td> <td>212.1</td> <td>206</td> <td></td> <td></td> <td></td>	1410	8.8	11.05	0:370	9.02	8.49	212.1	206					
Ligo       9.6       11.36       0.369       9.57       8.45       2.6.2       195         Ligs       9.5       11.62       0.363       10.26       8.42       200.55       1.52       1.52         Ligs       10       11.72       0.362       10.33       8.46       197.87       19.0       1.53         Ligs       10.31       8.46       197.87       16.7       1.67       1.67         Ligs       10.32       6.41       10.32       8.46       197.87       16.7       1.67         Ligs       11.77       0.360       10.52       8.46       197.57       1.67       1.67       1.7         Ligs       11.32       6.411       10.92       8.47       183.87       1.62       1.67         Ligs       11.72       0.396       9.57       8.47       187.87       1.62       1.67         Ligs       11.75       0.370       9.547       8.457       1.62       1.7       1.7         Amalysis       Preservative used.       Container requirements       No. of containers       No. of containers         Stars       Action       Stars       Action       Stars       No. of containers	1475	9.2	11.14	0.371	8.02	8.49	216.5	174					
1425"       9.9       11.62       0.362       10.26       8.42       200.5"       151         430       10       11.72       0.362       10.53       8.46       1978       19.0         435       10.4       11.75       0.362       10.73       8.46       1978       19.0         435       10.4       11.75       0.362       10.73       8.46       1978       19.0         444       10.5       11.36       6.411       10.40       8.47       183.8       16.2       16.7         444       10.5       11.24       0.360       9.54       8.47       183.8       14.5       14.5         450       11.6       11.24       0.370       9.54       8.45       181.4       122       14.5         450       11.6       11.35       0.370       9.54       8.45       181.4       122       14.5         450       11.6       11.35       0.370       9.54       8.45       181.4       122       14.5         450       11.15       0.370       9.54       8.45       181.4       122       14.5         451       11.35       Preservative       Container requirements       No	1420	9.6	11.36	0.369	9.57	8.45	210,2	195					
430       10       11.72       0.362       10.33       \$746       177.87       16.7       1         435       10.4       11.75       0.360       10.78       \$7.46       197.57       16.7       1         445       10.5       11.74       0.360       10.78       \$7.46       197.57       16.7       1         444       10.5       11.72       0.360       10.78       \$7.47       183.8       16.7       1         445       11.2       11.24       0.394       9.757       \$7.47       183.8       16.7       1         450       11.6       11.27       0.400       9.257       \$7.46       197.47       122       1         ample information: method, container number, size, and type, preservative used.       Container requirements       No. of containers         Analysis       Preservative       Container requirements       No. of containers         502ES ACT       1       1       1       1       1       1         502ES ACT       1       1       1       1       1       1       1         10       1       1       1       1       1       1       1       1       1       1	1425	9.8	11.62	0.368	10,26	8.42	200,5	182					
435       12.4       11.75       0.360       10.78       9.44       157.5       167       167         444       10.8       11.36       6.411       10.40       \$.47       183.8       1622       164         444       11.6       11.24       0.396       9.757       \$.47       183.8       1622       164         444       11.6       11.24       0.396       9.757       \$.47       183.8       1622       164         450       11.6       11.75       0.400       9.257       \$.47       183.8       164       175.4       175.4         450       11.6       11.75       0.370       9.54       8.455       181.4       122       137.4       145.5         ample information: method, container number, size, and type, preservative used.       Container requirements       No. of containers         430       9.585       0.370       9.54       8.455       12.44       122       122         411.15       11.15       0.370       9.54       8.455       16.44       122       122       144         411.15       11.375       0.370       9.54       8.455       16.44       122       144       145       145	1430	10	11.72	0,362	10.33	8.46	197,8	190					
Line     11.3C     0.39C     9.44     183.8     162       Line     11.24     0.39C     9.75     8.47     182.8     145       Line     11.24     0.39C     9.55     8.47     182.8     145       Ario     11.15     0.370     9.57     8.47     182.8     145       Ario     11.15     0.370     9.57     8.47     182.8     145       ample information: method, container number, size, and type, preservative used.     Container requirements     No. of containers       Analysis     Preservative     Container requirements     No. of containers       Star Actin 11     1     1     1       bservations/Notes:     1     1     1       ump Depth:     Star Actin 11     1     1       Star Time:     VOC Reading:       ump Lepth:     Star Actin 11       Star Time:     VOC Reading:	1435	10.4	11.79	0.360	10,58	8.46	195.9	167					
4.30       11.2       11.24       0.370       13.4       17.22       14.5         4.50       11.6       11.24       0.460       9.25       7.46       Kr. 2       13.7       13.7         4.50       11.6       11.24       0.370       9.54       8.45       181.4       12.2       13.7         ample information: method, container number, size, and type, preservative used.       Container requirements       No. of containers         Analysis       Preservative       Container requirements       No. of containers         552KSTACTEAL	10140	10.8	11156	0:4/1	10,40	8.47	185,8	162					
Image	14 50	116	11,29	0.396	0.75	8.47	18L.8 Kil 7	137					
Analysis     Preservative     Container requirements     No. of containers       Analysis     Preservative     Container requirements     No. of containers       Start Time:     VOC Reading:       ump Depth:     SEE TAKE 1       SMSD     Duplicate ID No.:       gnature(s):     Duplicate ID No.:	1455	1.8	11.15	1.370	9.54	8.45	181.4	177-		N.	- Al		
Analysis     Preservative     Container requirements     No. of containers       SBESDER	Sample info	ormation: meth	od, container	number, size	, and type, pr	eservative use	ed.	100					
Space		Ana	lysis		Prese	ervative	(	nents		No. of containers			
Specific Market     Specific Marke													
SPARSACTION     Servations/Notes:     ump Start Time:     VOC Reading:     ump Depth:     SER     Duplicate ID No.:     ignature(s):     Duplicate ID No.:				2									
bservations/Notes: ump Start Time: VOC Reading: ump Depth: SER PACE 1 ample /Time: S/MSD Duplicate ID No.: gnature(s): Duplicate ID No.:		SBERY	ACTZ	-									
bservations/Notes: ump Start Time: VOC Reading: ump Depth: SER PASE 1 ample /Time: S/MSD Duplicate ID No.: ignature(s):													
bservations/Notes: ump Start Time: VOC Reading: ump Depth: SER TASR 1 ample /Time: S/MSD Duplicate ID No.: gnature(s):								~					
bservations/Notes: ump Start Time: VOC Reading: ump Depth: SER PASE 2 ample /Time: S/MSD Duplicate ID No.: ignature(s):													
ump Start Time:     VOC Reading:       ump Depth:     SER PASE 1       ample /Time:        S/MSD     Duplicate ID No.:       ignature(s):	Ohservatio	ns/Notes	-		I						l		
ump Start Time:     VOC Reading:       ump Depth:     SER       ample /Time:       S/MSD       Duplicate ID No.:	Subsci valiU	13/110163.											
ump Depth:     SER     PASE 1       ample /Time:        S/MSD     Duplicate ID No.:       ignature(s):	Pump Star	rt Time:			VOC Readir	ng:							
ump Depth:     SER     THE IE       ample /Time:		and the product $\overline{a}$ . The			01	J.							
ample /Time: S/MSD Duplicate ID No.:	Pump Dep	th:	SER	- PAC	SIE 1	-							
ample /Time: S/MSD Duplicate ID No.: gnature(s):	and the second												
S/MSD  Duplicate ID No.:	Sample /Ti	ime:			-								
gnature(s):	MS/MSD	1	~~		Duplicate ID	No.:							
1 TH_	Signature(s	5):	AG	2`									
	/	-	LE	/									
2~ 1	0	no	Λ										



P9 4/4

Client: NAVFAC	Project Number:	679580	.09. F.T. N	rs
Location: OLE COUPEVELUE	Well ID:	WI-CO	- MWOST	2
Event: FEB 2017 GW SOMPLEND	Sample ID:	WT-C	CU-GWOS	M-0217
Date: 2/23/17-	Sampling Team:	Eros	A. Bilan	PG
Weather: 3005, RAINY, SNOWY			/	
Total Depth: <u>パフケーの</u> FT.(BTOC)		Me	asuring Device:	ISI W HACH TUNSTONEWNE THE 2002
Depth to water: (-) 123.65 FT.(BTOC)			Date and Time:	2/23/17 1215
Water Column: 57.35 FT.				
(x) 0-16-3 GAL/FT.		Well Dia.	Volume	
Well Volume: S. 4 GAL.		(inches)	(gallons/foot)	
Total Purge Vol.: 15 GAL.		1	0.041	
		1.25	0.064	
Purge Device: BESST PANA CEA 200		2	0.163	
		4	0.653	

**GROUNDWATER SAMPLING DATA SHEET** 

					SAMPLE	DATA			
Date: 2/	23/17	Temp.	Cond.	DO	pН	ORP	Turbidity	Other: DTW	Color / Odor / Comments
Time: /	215	°C	mS/cm	mg/L	SU	mV	NTU	1 btvc	Color / Cuor / Comments
Method: 2	an FLow								
		0,1	0:01	0.2	FIELD PARA	METERS			
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP	Turbidity NTU	Other: <u>Drw</u>	Color / Odor / Comments
1500	12	11.07	0.360	8.97	8.44	181.6	127	123.C	GNEY, CLOUDY, NOUDE
1505	12.3	11,22	0:358	8.84	8.43	181.7	.132		
1510	12.7	11,34	0.357	8.84	5.42	181.5	125	\	
1575	13.1	11.46	0.354	8.74	8.42	180,8	116		
1520	13.5	11.52/	0.355	8.73	8.41	180.3	101		
1525	14.2	11.48	0,355	9.75	5.41	179.6	600	V	\$V
1530	15	11,40	0,355	8.75	8.41	179.8	96		propost
						+			
O a man la la f									
Sample Info	ormation: meth	od, container	number, size	, and type, pi	reservative us	sea.	Container require	manta	No. of containers
001	Ana		. 1	Prese	ervalive	1.001	Container require	ements	No. of containers
PPZ	0012000+	53711	wed	2(1		150	nel 141212	12	L
	58-13	PA	534						
	212-5								
			1		,				
Observatio	ns/Notes: 2	U Sec / 70	Ser (	fischer	- Trecher	10 9	15 PS! (	2 approx	300 mlmin
	1	1		/	//			e pr	NOLO11
Pump Star	rt Time: $2 \mid 23$	12 1211		VOC Readi	ng: 0.0	11-			
Pump Dep	oth: 1/+	the bill	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		hellow				
	40	pump	1	545 00	LLECT	WI-C	-MWOS	M-DZIT	5
Sample /Ti	ime: 2/23	10 15	45			ton F	FL S	87/mois	USEPA
MS/MSD	N	A	~	Duplicate ID	No.:	NA			2
Signature(s	s):	-1	)	1					
Ch	2~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	d	R	, P.E	>				



			GROUNDW	ATER SAMP	LING DATA	SHEET			l .		
Client:	NAVFAC		Proj	Project Number: 679580,09.EI, WS							
Location: OLS-	Conferille		_	Well ID:	WI-CI	-MWOSTS	>	2			
Event: FLb	17GW Sal	mpling	_^	Sample ID:	WI-C	V - GIN05	5-10717				
Date: 2/2	-4/17	_ `	San	npling Team:	Collin	Hall, Elo	5 Billien		_		
Weather: Clear	37°F, N	Owina	_						_		
Total Depth:	17400	FT.(BTOC)			Me	asuring Device:	YST-GO	2. HARTH TUNGTOTING	FTR JIDOL		
Depth to water:	(-)120.58	FT.(BTOC)		÷		Date and Time:	7/24/1	7 1731			
Water Column:	342	FT.				Bate and third	-4-11		-		
	(X)0,163	GAL/FT.			Well Dia.	Volume	1				
Well Volume:	0.56	GAL.			(inches)	(gallons/foot)					
Total Purge Vol.:	leam	GAL			1	0.041					
					1.25	0.064					
Purge Device: Bi	ESST PANA	CEA 20	0		Ø	0.163					
0				-	4	0.653					
						CONCERNITION OF THE OWNER	1				
				SAMPLE I	DATA				1		
Date: 2/24/1	7 Temp.	Cond.	DO	рН	ORP	Turbidity	Other Dr.	Color / Odor / Osman	1		
Time: 11112	°C	mS/cm	mg/L	SU	mV	NTU	Other: 12700	Color / Odor / Comments			
Method: Jour Flo	pier Pierce 1	14							· 12		
() ~ ( )	11102	J		FIELD PARA	METERS						
Purge	Vol. Temp.	Cond.	DO	рН	ORP	Turbidity		Τ	1		
(gals	s) °C	mS/cm	mg/L	SU	mV	NTU	Other: Dru	Color / Odor / Comments			
1110 500 p	L 8.68	1.260	1.70	8.06	218.0	184	121.5	gray doub a Add	Tiess,		
1736 1000 m	nL 9.09	0.379	13,90	8.29	161.3	167	120.7	alan chan ola	11-55		
1730 Sam	Ple WI	U-GIN	55-12	17 ta	LEA		121,5	SPTC. ld but a	Ftuin		
- · / · · · · · · · · · · · · · · · · ·	1 10/10/2	T yr	<del>an a</del>					- rager our			
									1		
	-49.								1		
		· ·					•		1		
								6 C	]		
									]		
			×.					8	]		
Sample information:	method, container	number, size,	, and type, pre	eservative use	ed.						
	Analysis		Prese	rvative	(	Container requirer	nents	No. of containers	199		
PEC USEPI	4 537/m	010	ICE	-	150	m HDPIE		2			
						19					
							· · · · · · · · · · · · · · · · · · ·		-		
					11.1				4		
Observations/Notes:	80 PSi	30 Sec	120 Sen	Reches	geldisch	mr.					
	110			A	0	rell has 1					
Pump Start Time:	((10		VOC Readin	ig: 0.0 j	spren			2			
Duma Dantha 10	150-122	.00 ( hu)	to low	r in ord	et to ge	r sample) (	TOP OF Pu	(mp)			
Pump Deptn: 1 2			J. V		0			7			
Sample /Times	J-(N-6)	1855-10	1171 1	TBO							
	J. J Q.	. <u></u>	Dunlingta ID	No: A/D-					-		
Cignoture (a)			Duplicate ID	NO.: / H					-		
Signature(s):	m 10m	<u>.</u>							1		



Client:			O D O UNDW					
Location:	NAVFAC		BROONDW	ect Number:	679580	5HEEI	E God W	5
Event: $FEB'IT$ Date: $2IIIIT$ Weather: $HO$ : $R$	GN SAMP	- <u></u> <u></u> ن	San	Sample ID: pling Team:	WE-CU WE-CU EROS	- MW 1012 - MW W A. BELYE	I-CV-61 U P.G	N1013-0217
Total Depth: Depth to water: Water Column: Well Volume: Total Purge Vol.:	206.30 (·) 142.12 64.18 (x) 0.163 10.46 32	FT.(BTOC) FT.(BTOC) FT. GAL/FT. GAL. GAL.		2	Me Well Dia. (inches) 1	asuring Device: Date and Time: Volume (gallons/foot) 0.041	HOREBA U SE 600, HE 2/19/17	-ZZ IRON Piezómatric n
Purge Device: Bis	SST PANAC	EA 200			1.25 2 4	0.064 0.163 0.653		
				SAMPLE [	ATA			
Date: ב(ות (וס Time:	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTw btoc	Color / Odor / Comment
	Event: $F \Subset B$ $(17)$ Date: $2(14)(17)$ Weather: $40\%$ ; $7$ Total Depth: Depth to water: Water Column: Well Volume: Total Purge Vol.: Purge Device: $B \bowtie$ Date: $2(15)(17)$ Time:	Event: $FEB irr Gu Samper         Date:       2(14 17)         Weather:       40^{\circ}i, RADNY, WINOY         Total Depth:       206.30         Depth to water:       (-) 14Z, 12         Water Column:       64.18         (x) 0,163         Well Volume:       10.46         Total Purge Vol.:       32         Purge Device:       Bisssi T Panapac         Date:       2(14 17)       Temp.         C       Total Purge       00.16^{\circ} $	Event: $FEB'D GW Same To U$ Date: $2I_{14}I_{17}$ Weather: $40^{\circ}i$ , RADAY, WENON 28 mplfTotal Depth: $206.30$ Depth to water: $(-) 142.12$ $(-) 142.12$ FT.(BTOC)Water Column: $64.18$ $GAL/FT.$ Well Volume: $10.46$ GAL.Total Purge Vol.: $32$ GAL.Purge Device: $BESST$ $PanaceA$ $200$ Cond.Time: $\circ$ C $mS/cm$	Event: $FEB'D GW Sampere U$ Date: $2[14]D$ San         Weather: $40^{\circ}i$ , $RADJY, WEJOY 28 mplf$ San         Total Depth: $206.30$ FT.(BTOC)         Depth to water: $(\cdot)$ $14Z_{-1Z}$ FT.(BTOC)         Water Column: $64.18$ FT. $(X) O, 163$ GAL/FT.         Well Volume: $10.46$ GAL.         Total Purge Vol.: $3Z$ GAL.         Purge Device: $BESST$ $Panacea$ $200$ Date: $2(I_{12})$ Temp.       Cond.       DO         Date: $2(I_{12})$ Temp.       Cond.       DO         Time: $\circ$ C       mS/cm       mg/L	Event: $F \in B$ in Give Segme To CSample ID:Date: $2(14 17)$ Sampling Team:Weather: $40^{\circ}i$ , RADY WEVOY 28 welfTotal Depth:Sampling Team:Total Depth: $206.30$ FT.(BTOC)Depth to water: $(-) 14Z, 1Z$ FT.(BTOC)Water Column: $64.18$ FT. $(X) O, 163$ GAL/FT.Well Volume: $10.46$ GAL.GAL.Total Purge Vol.: $3Z$ GAL.GAL.Purge Device: $BESST$ $BESST$ $PanaceA$ $200$ $BH$ Time: $^{\circ}C$ $mS/cm$ $mg/L$ SU	Event: $F \in B$ in Give Sequence 1Sample ID: $W = -C + C + C + C + C + C + C + C + C + C $	Event: $F \in B$ in $G_{UV}$ Sumportion inSample ID: $W = -M tor W$ Date: $2[M[17]$ Sampling Team: $E E O S A$ , $B = M tor W$ Weather: $40^{\circ}i$ , $E A = D Y W = 0 Y 28 weltSampling Team:E E O S A, B = M tor WTotal Depth:206.30FT.(BTOC)Measuring Device:Depth to water:(1) H = 1, 12FT.(BTOC)Date and Time:Water Column:64.18FT.Well Dia.Volume(inches)(gallons/foot)10.041Total Purge Vol.:32GAL.10.041Purge Device:B = 5 = 5 = 7 Pan percent 20020.16340.65340.653SAMPLE DATADate: 2(I_{12} (I_{12})Time:\circ CM cond.M cond.D OpHO RPM cond.M c$	Event: $FEB in Gw SampersonSample ID:WI - Cu - GwDate:2 va _{17}Sampling Team:E E O S A, BELYEO F.GWeather:40^{\circ}i, EADJY WIFYOY 28 waltFT.Weather:40^{\circ}i, EADJY WIFYOY 28 waltHonIIBA UTotal Depth:206.30FT.(BTOC)Depth to water:(\cdot)  4Z_{+1}Z_{-}FT.(BTOC)Water Column:64.18FT.(x) O, 1603GAL/FT.Well Volume:10.4G10.4GGAL.Total Purge Vol.:3ZGAL.1Outling Device:BESSTPurge Device:BESSTParameter 200200064Date:2(1n(n)Temp.Cond.Date:2(1n(n)Time:^{\circ}CmS/cmmg/LSumple Device:BESTmS/cmmg/LSumple Device:Det E DATADate:2(1n(n)Temp.Cond.mg/LSUmVNTUbfc/C$

					FIELD PARA	METERS			
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTC~	Color / Odor / Comments
1230	0	12.52	0.692	10,15	7.12	12	>1000	140,3	CLEAR, COLUZLIEDS UDURLESS
240	1	12.45	0.712	10,23	7.08	-3	102	140,3	
250	1.5	12.36	0,683	9.89	6.95	-15	67.3	140.3	
300	2.0	12.12	0,641	9,70	6.89	-20	53,1	140.3	v
310	2.5	12.10	01635	9.69	6.71	-37	4513	140.3	PUMP ISSUES
1330	3	12.05-	0.625	10,29	6.75	- 40	99.1	14013	CLEARLACELOIZLIESS, CODUIZLIESS
340	4.5	12.05	0.618	10,15	4.83	-16	43,1	140.3	
1350	5,5	12,15	0.623	9.99	6.90	-28	26,2	140.3	
400	7,0	12.25	0.615	9,83	6.85	-41	16.2	140.3	
410	8.0	12.10	0,623	9,92	6,90	-57	5,3	140.3	Ŷ
420	9.0	12.10	0.617	10,35	6.95	-63	3.6	140.3	MINCAPUM 255450
ample inf	formation: meth	od, container	number, size	, and type, pr	eservative use	ed.			
	Ana	lysis		Prese	ervative	(	Container require	ements	No. of containers
fc's i	USEPA 53	57 MONIFI	EPSOPHA	ICE		(2)300	2 ml HDPP	ĩ.	2
		i.							
bservatio ump Star	ons/Notes: $\frac{2}{26}$ rt Time: $2/14$	discharg 17 123	20 Sec.	لے کرنے د VOC Readir	herge / 20 ng: O. U PP well here	Seconds me	rechangen (	@ 110' F	37
ump Dep	oth: Bottom/	SUCTION (	@ 196' 6-	tec 5	AWVIE	- IWI-	- CV - GW1	60 - 0217	- COLUEGED
ample /T	ime:				(2)	250 ml	HOPE BOTT	125 Unprese	and for Pife's@«
S/MSD	NA			Duplicate ID	No .: NA				
ignature(s	s): 	FP (	P.G						



				GROUNDV	VATER SAM	PLING DATA	SHEET		
Client:	4	NAVFAC		Pro	ject Number	67958	0,09. FT. W	TGW	
_ocation:	OLF CO	UPEVILI	E	_	Well ID	WI-OU	-MWIDD		
Event:	10 200	GW SAI	NPLING	_	Sample ID	WI-C	N-GWIOD	5-0217	
Date:	2/19/17		_	Sai	mpling Team	EROS	A. BILY	EU P.G	
Neather:	40"SIZAT	NY, WIND	Y,28mpH	_					
Total Dept	th: 2	206.30	FT.(BTOC)			M	easuring Device:	HORITISA (	1-22 Presidentes a
Depth to v	vater: (-)	142,12	FT.(BTOC)				Date and Time:	21	ICO THE ZIO REITICE ME
Nater Col	umn:	64,18	FT.						
	(x	0.163	GAL/FT.			Well Dia.	Volume		
Vell Volu	me:	10.46	GAL.			(inches)	(gallons/foot)		
Total Purg	ge Vol.:	32	GAL.			1	0.041		
						1.25	0.064		
Purge Dev	lice: BES	st Pana	CEA 200		-	2	0.163		
						4	0.653		
								1	·
					SAMPLE	DATA	T <u>-</u>		
Jale: 2	1917	remp. °C	Cond.		pH SU			Other: DTW	Color / Odor / Comments
Anthe /	130	+ <u> </u>	morom	l ing/L					
Method: L	.cm } ton Noun	12	+	+ + + + + + + + + + + + + + + + + + + +		WETERO			
	D	± 0.1	12,02 7	1.00-1	FIELD PARA	METERS	-		
Time	Purge Vol.	lemp.	Cond.	DO ma/l	PH	ORP	Turbidity	Other: PTW	Color / Odor / Comments
11170	(yais)		mo/cm	mg/L	50	mv	NIU		CLEAR (DEDILLES).
1430	10	12.10	0.618	10.92	6.14	-61	71000	140,5	ODOILLISSS
1490	1.2	11,40	0.559	8.73	6.85	- 14	35.7	140,5	2
1575	125	1136	10.541	9.59	7.11	-110	18.2	140.5	HUMP ISSUES
1525	125	11.30	0. 545	1.05	700	-83	17.6	140,5	
15 33	14.5	11.56	1 571	8.75	1.00	0)	18.1	140.5	
1.00	150	11.70	1.535	5 90	1.611	-85	17.5	140,5	
GIO	16.5	11.58	10 5-29	10.12	694	-94	26.0	140.3	
1620	18.0	11.43	0.540	10,84	0.95	-84	12. 9	140.3	
1630	19.5	11.32	0.534	9,34	6,94	-83	81	140,3	MINON RUMP ISCORD
1650	-1120	11.23	0.534	8.68	6.95	-84	47.2	140.3	
Sample inf	ormation: meth	od, containei	r number, size	, and type, pr	eservative us	ed.			
	Ana	lysis		Prese	ervative	(	Container requiren	nents	No. of containers
FCISUS	EPA 537	mudified	50449	ICE	-	125-250	ml HOF	215	Z
						@ z/2	2112		
Necessatie	no/Nictory	1.		<u> </u>			0.0		1
Dservatio	ns/Notes: 20	\$ 20 Sec	dischen	gie Frecho	eng-c	compresso	(P(ps)) =	0.4325(psi)	* pump suctions (F+bs
umn Star	t Times al		01	Upsi		21~	-	(Pf)	Dzern U
ump Star	t time: 2/19/1	7 1230		VUC Readin	ig: 0.0 pr	DOND CO	JTAD L		( cush)
ump Den	th: Bottom	Sector	1 @ Ian			ON TIM	16:20 Se-	0	The GAS
		101201	146° t	アキロこ		OFF TH	HE; 20 Sec	@ ILOPSE	CTB
ample /Ti	ime: 2/20/1-	2 1145							
IS/MSD	NA		2	Duplicate ID	NO .: NA	-			
Signature(s	s):	T	V O						
		DK	7. 1.0	2,					
6	hn t	o to	$\mathcal{V}$						
/		1/							



				anounda	TATER SAME	LING DATA	OTTLET		
Client:		NAVFAC		Pro	ject Number:	67958	0,09,FI.	Govins	
Location:	OLF COUF	EVILLE			Well ID:	WI-CU	-MWIDD		
Event:	FEB 2017	GU SAM	PUING		Sample ID:	WE - CL	-GWIOD	-0717	
Date:	2/19/17			- Sar	npling Team:	FROS	A. BD. YE	P	
Weather:	40% PAT	-24	-			6-145	14. OIL/120	1,6	
	- CO - KIA							HORIEBA -	1-22
Total Dept	:h: <u>2</u>	06.3	_FT.(BTOC)			Me	easuring Device:	YSE 600, 14E	ERON Picconstruction
Depth to w	vater: (·	)142,12	_FT.(BTOC)				Date and Time:	2/19/17 -	- 2/20/17
Water Col	umn:	64.18	_FT.						
	()	()0.163	GAL/FT.			Well Dia.	Volume		
Well Volur	ne:	10,46	GAL.			(inches)	(gallons/foot)		
Total Purg	e Vol.:	32	GAL.			1	0.041		
						1.25	0.064		
Purge Dev	rice: Ba	SST PAN.	ACEA 20	<del>ن</del>		2	0.163	1	
					-	4	0.653		
					SAMPLE	DATA			
)ate: z	19/17	Temp.	Cond.	DO	рН	ORP	Turbidity	Other and	
Time: 17	05	°C	mS/cm	mg/L	SU	mV	NTU	Otner: DTW	Color / Odor / Comments
Method:	v Flow 7								
	Villme	-				METERS			
print hereite	Purgo Vol	Tomp	Cond	DO			Turkiditu		
Time	(nale)	°C	mS/cm	ma/l	PH SII			Other: DTw	Color / Odor / Comments
1205-	2/	11. 2	A		1.0-			ptor	2
101	-1	11,20	01034	5.68	6,75	-05	2416	140,3	FUMIT ISSUES
10930	22	10,37	0,504	8,81	6.42	13.1	1,57	140,3	Switcher war
0940	23	10,54	0,506	7.98	7.04	-11,3	1,21	140.3	ELEAN, COLORLISS)
0950	24	10.53	0,506	9,13	7,09	-20.4	1.17	14013	
1000	25	10.57	0,506	9,12	7.11	-25.0	1.49	140.3	
1000	24	10.57	0,506	8,92	7.12	- 29.1	1.32	140.3	
1020	22	10,58	0,507	9,29	7,13	-30.5	1,50	140.3	
1030	28	10,57	0,508	9.57	7,14	- 31.1	1.64	140.3	
1040	29	10.57	0.506	9.84	7.24	-17.3	1.54	140.3	
1050	30	10,56	0.577	8.52	7.15	- 36.9	3.08	140,3	
1110	32	10.57	0.504	8.48	7,14	-40,1	+163 1.63	140.3	pump ofe
ample info	ormation: meth	nod, container	number, size,	and type, pre	eservative use	əd.	@ 2/10/17		
	An	alysis		Prese	rvative	(	Container requirem	nents	No. of containers
FC'S U	SEPA- 53	7 mudifie	1 50949	TCE		125250	mI HOPE		2
						CO	2/20/17		
								1	
Observation	ns/Notes:	0.10-	1	/	1		26		
22517410	2	05/20	o discl	verge / veci	herga (C	//0	ps.		
umn Star	t Time: al.	1.2	0	VOC Readin	a. 0.0 -	010			
any otar	~ [19	1 + 143	0	. ee neauli	PI DID PI	1			
Pump Depi	th: 1961	hter L	L .		rellre				
and ach		proc bud	do m	-	SAMPLE	VWI-C	u = GW10D	-0217	)
	me 2/201	7 1145							
Sample /Ti	110. 2100	1173		Duplicate ID	Notatio				
Sample /Ti	N1.A			Dupilcale ID	NU. NY				
Sample /Ti	NA		>						
Sample /Ti //S/MSD Signature(s	NA ):	7	n + r	00					
Sample /Ti MS/MSD Signature(s	NA ):	T	Bla F	26					



Contraction of the second second second	Sector Provide and a sector				LING DATA	JILLI		
	NAVFAC		Pro	ject Number	6795	80.09.FI	600 WS	
OLF COU	PEUIL	-E	-	Well ID	WI-C	V- MUUIOS	. MW	10M
-ES 2017	- GW SA	SMPLENG.	-	Sample ID	WI-C	W - <del>Gwi</del> u	5-0-217	MW10M
2/21/17			Sa	mpling Team	EROS	A. BILYE	D P.G	
40°S, IZAIN	54		-					
h: ) ⁻	59 20	FT.(BTOC)			Me	easuring Device:	VST LOD I	TUURSEDIMETER 2
ater: (-)	136.05	FT.(BTOC)				Date and Time:	131 600 H	(200 Meziometriz w
umn: <u>()</u>	1315	FT.					-2/2.111	1200
$\frac{1}{(\mathbf{x})}$	0.163	GAL/FT.			Well Dia	Volume	1	
ne:	3.77	GAL.			(inches)	(gallons/foot)		
e Vol.:	11.5	GAL.			1	0.041	-	
		_			1.25	0.064		
ice: BEss	T PANA	CEA 20	0		2	0.163	1	
lan					4	0.653		
				SAMPLE	DATA			
1/17	Temp.	Cond.	DO	pН	ORP	Turbidity	Other: Down	Color / Odor / Commonto
.00	°C	mS/cm	mg/L	SU	mV	NTU	bloc	Color / Comments
N FLOW   JOLUMIZ								
				FIELD PARA	METERS			
Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	Others	Color / Odor / Ormania
(gals)	°C	mS/cm	mg/L	SU	mV	NTU	Dto -	Color / Odor / Comments
б	11.62	0.5-49	9.27	7.51	13.6	24.0	136.2	
6.5	11.58	0.578	8.17	7.48	19.8	46.4	136.2	
0,6	11.58	0.585	7.80	7.48	23.5	32.6	136.2	
0.6	1089	0.588	7.32	7.48	281	27.6	136.2	PUMP ISSUES
200	11.89	6.516	5.77	7.48	216.1	36.1	136.1	PUMP ISSUES
4.0	11.16	6.575	9.61	7.45	220,1	32,3	136.2	
4.5	10.66	0.514	6.91	7.48	227.4	36.0	136.2	
5.1	10.61	6,515	6.68	7.47	227.0	28.0	136,2	
5.6	10.62	0.514	6.72	7.47	227.0	29.1	136.2	
6.2	10.56	0.515	6.75	7.47	228.2	26.1	136.2	RUMP ISSUES
6.7	10.63	0,575	6.81	7.47	229.7	3:16	136,2	
rmation: meth	od, containe	r number, size	and type, pr	eservative us	ed.			
Ana	lysis		Prese	ervative	(	Container requirer	nents	No. of containers
	and the second							
			***					
no/Niotoo:	/		/	4				
IS/INULES.	) SEC/10	SEL DIS	CHARGE	ZECHARGIZ	E C 85-	90 Bi. NO	FLOW THE	w.
	1	300-100 m	Zoo	300 mln	in	FLOW T	HIZU LEEF	ATES ADAITIONA
Time: 2/2	12 1200		VUC Reauli	ig: 0.0	Rpn u	NACLOUPTO	E P HEAD	PRESSUR E.
Time: 2/2/	17 1200			111	A IA	POTTENIAL	ATIZ SUP	DLY CONTIN
t Time: $z/z_{1}$	17 1200 A @ 150	btoc		wellher			<b>T</b> . 1	
t Time: <i>2/24</i> h: Вето~	117 1200 A @ 150	btoc		Wellheer	J	VETH AZIL	IN WATER	LING,
t Time: Z/ZII h: Вето~ ne:	A @ 150	1 btoc		Well her	3	JETH AIR	IN WATER	LING,
t Time: Z/Z+/ h: Вепо~ ne:	A @ 150	1 btoc	Duplicate ID	No.: NA	J.	JETH AIR	IN WATER	LUNG,
t Time: $z/z_{1}$ th: BOTTON	A @ 150	' btoc	Duplicate ID	No.: NA	36	JETH AIR	IN WATER	LUINE,
the Time: $z/z_{ij}$ the Betton ne: NA	A @ 150	btec	Duplicate ID	No.: NA	<b>J</b>	UDTU AIR	IN WATER	LUDNE,
	$40 > 1222$ h: $1^{11}$ ater:       (-)         imn: $2$ ice: $40 < 12$ e Vol.: $1$ ice: $BE55$ ice: $BE55$ $1/17$ $00$ $200 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ $100 = 12$ $11/17$ <	$40 \le 12 \times 10^{\circ}$ h: $159, 20$ ater: $(\cdot) 136.05^{\circ}$ imn: $23.15^{\circ}$ $(x) 0.163$ le: $3.77^{\circ}$ e Vol.: $11, 5^{\circ}$ ice: $BESST PANF$ Purge Vol.: $11, 5^{\circ}$ $0^{\circ}$ $\circ^{\circ}$ $10^{\circ}$ $\circ^{\circ}$ $0^{\circ}$ $0$	159, 20       FT.(BTOC)         ater: $(-)$ 136.05       FT.(BTOC)         imn:       23.15       FT. $(x)$ 0.163       GAL/FT.         ie: $3.77$ GAL.         e Vol.:       11.5       GAL.         ice:       BESST       PANACEA       200 $1/1, 5$ GAL.         ice:       BESST       PANACEA       200 $1/1, 7$ Temp.       Cond. $00$ °C       mS/cm $200$ °C       mS/cm $200$ $11.62$ $0.549$ $0.00$ °C       mS/cm $200$ $11.58$ $0.545$ $0.6$ $11.58$ $0.578$ $0.6$ $1089$ $0.585$ $0.6$ $1089$ $0.585$ $0.6$ $10.89$ $0.585$ $0.6$ $10.89$ $0.575$ $0.6$ $10.65$ $0.515$ $0.6$ $10.62$ $0.575$ $0.6$ $10.62$ $0.575$ $0.6$ $10.62$ $0.575$ $0.6$ <td>$40.5_{+12}$ (2.2.5.7       FT.(BTOC)         ater:       (-) /36.65       FT.(BTOC)         imn:       23.75       FT.         (x) 0.163       GAL/FT.         10:       3.77       GAL.         e Vol.:       /1,5       GAL.         ice:       $BESST$       PANACEA       200         ice:       $BEST$       PANACEA       200         ice:       $BEST$       PANACEA       200         ice:       $BEST$       PANACEA       200         ice:       $BEST$       PANACEA       200         ice:       $BEST$ $BEST$ $BEST$ $BEST$         ice:       $BEST$ $BEST$       &lt;</td> <td>H:       $159, 20$       FT.(BTOC)         ater:       $(1)36.05^{-}$       FT.(BTOC)         imn:       $23.15^{-}$       FT.         (x)       $0.163$       GAL/FT.         re:       $3.77^{-}$       GAL.         e Vol.:       $11, 5^{-}$       GAL.         ice:       $BESST$       PANACEA       $200^{-}$         Sample       $11, 5^{-}$       GAL.         ice:       $BESST$       PANACEA       $200^{-}$         Sample       $11, 5^{-}$       GAL.         ice:       $BESST$       PANACEA       $200^{-}$         Summaria       $00^{-}$       DO       pH         $0u^{-0}$       Cond.       DO       pH         $0u^{-0}$       Temp.       Cond.       DO       pH         $0u^{-0}$ $mS/cm$ $mg/L$       SU         $D$ $f1.62^{-}$ $0.549^{-}$ $7.27^{-}$ $7.51$ $0.55^{-}$ $11.5^{-}$ $0.578^{-}$ $7.90^{-}$ $7.48^{-}$ $0.6^{-}$ $10.6^{-}$ $0.576^{-}$ $7.32^{-}$ $7.48^{-}$ $0.6^{-}$ $11.6^{-}$ $0.5716^{-}$ $5.77^{-}$ $7.47^{$</td> <td>Image: Problem of the structure of the str</td> <td>AUSING       FT.(BTOC)       Measuring Device:         ater:       $(1).36.05^{-1}$       FT.(BTOC)       Date and Time:         imn:       $23.15^{-1}$       FT.       Date and Time:         imn:       $3.77^{-1}$       GAL.       Well Dia.       (inches)         e Vol.:       $(1,5^{-1})$       GAL.       Well Dia.       (inches)         e Vol.:       $(1,5^{-1})$       GAL.       1       0.041         ice:       $BESST_PANACEA_200$       2       0.163         4       0.653       4       0.663         SAMPLE DATA         $t/(.7^{-1})$       Temp.       Cond.       DO       pH       ORP       Turbidity         $0a_{a}$       °C       mS/cm       mg/L       SU       mV       NTU         $0a_{a}$       °C       mS/cm<td>HUS, [ZATUX]       Human         h:       $[S9, 2D]$       FT.(BTOC)         ater:       (1)/36.657       FT.(BTOC)         imn:       23.157       FT.         (X) 0.163       GAL/FT.       Date and Time:       $[2/2^{-1}]17$         be vol:       $[1], 5^{-1}$       GAL.       Well Dia.       Volume         a Vol::       $[1], 5^{-1}$       GAL.       Image: Condect /td></td>	$40.5_{+12}$ (2.2.5.7       FT.(BTOC)         ater:       (-) /36.65       FT.(BTOC)         imn:       23.75       FT.         (x) 0.163       GAL/FT.         10:       3.77       GAL.         e Vol.:       /1,5       GAL.         ice: $BESST$ PANACEA       200         ice: $BEST$ $BEST$ $BEST$ $BEST$ ice: $BEST$ $BEST$ <	H: $159, 20$ FT.(BTOC)         ater: $(1)36.05^{-}$ FT.(BTOC)         imn: $23.15^{-}$ FT.         (x) $0.163$ GAL/FT.         re: $3.77^{-}$ GAL.         e Vol.: $11, 5^{-}$ GAL.         ice: $BESST$ PANACEA $200^{-}$ Sample $11, 5^{-}$ GAL.         ice: $BESST$ PANACEA $200^{-}$ Sample $11, 5^{-}$ GAL.         ice: $BESST$ PANACEA $200^{-}$ Summaria $00^{-}$ DO       pH $0u^{-0}$ Cond.       DO       pH $0u^{-0}$ Temp.       Cond.       DO       pH $0u^{-0}$ $mS/cm$ $mg/L$ SU $D$ $f1.62^{-}$ $0.549^{-}$ $7.27^{-}$ $7.51$ $0.55^{-}$ $11.5^{-}$ $0.578^{-}$ $7.90^{-}$ $7.48^{-}$ $0.6^{-}$ $10.6^{-}$ $0.576^{-}$ $7.32^{-}$ $7.48^{-}$ $0.6^{-}$ $11.6^{-}$ $0.5716^{-}$ $5.77^{-}$ $7.47^{$	Image: Problem of the structure of the str	AUSING       FT.(BTOC)       Measuring Device:         ater: $(1).36.05^{-1}$ FT.(BTOC)       Date and Time:         imn: $23.15^{-1}$ FT.       Date and Time:         imn: $3.77^{-1}$ GAL.       Well Dia.       (inches)         e Vol.: $(1,5^{-1})$ GAL.       Well Dia.       (inches)         e Vol.: $(1,5^{-1})$ GAL.       1       0.041         ice: $BESST_PANACEA_200$ 2       0.163         4       0.653       4       0.663         SAMPLE DATA $t/(.7^{-1})$ Temp.       Cond.       DO       pH       ORP       Turbidity $0a_{a}$ °C       mS/cm       mg/L       SU       mV       NTU $0a_{a}$ °C       mS/cm <td>HUS, [ZATUX]       Human         h:       $[S9, 2D]$       FT.(BTOC)         ater:       (1)/36.657       FT.(BTOC)         imn:       23.157       FT.         (X) 0.163       GAL/FT.       Date and Time:       $[2/2^{-1}]17$         be vol:       $[1], 5^{-1}$       GAL.       Well Dia.       Volume         a Vol::       $[1], 5^{-1}$       GAL.       Image: Condect /td>	HUS, [ZATUX]       Human         h: $[S9, 2D]$ FT.(BTOC)         ater:       (1)/36.657       FT.(BTOC)         imn:       23.157       FT.         (X) 0.163       GAL/FT.       Date and Time: $[2/2^{-1}]17$ be vol: $[1], 5^{-1}$ GAL.       Well Dia.       Volume         a Vol:: $[1], 5^{-1}$ GAL.       Image: Condect



		SM		GROUND	WATER SAME	LING DATA	SHEET		
Client:		NAVFAC		Pro	oject Number	67958	30, 09. FT.	Geners	
Location:	ULF COUPI	EVILLE		_	Well ID	WI-C	U-MW105	MW10	M
Event:	FEB 2017	- Gw 54	MOLING	2	Sample ID	WI-C	W-Galos	- 0217	MW10M
Date:	2/21/17		-	Sa	mpling Team	Eros	A. BERYS	N R.G	
Weather:	4005,1ZA3	ENY		-			0		
Total Dep	oth: /	59.20	FT.(BTOC)			M	easuring Device:	YST 600, HACH	TUNST DT UNSTER
Depth to	water: (-)	136.05	FT.(BTOC)				Date and Time:	2/21/17	1200
Water Co	lumn:	23.15	FT.						
	<u>(x</u>	0.163	GAL/FT.			Well Dia.	Volume		
Well Volu	me:	3.77	_GAL.			(inches)	(gallons/foot)		
Total Pure	ge Vol.:	11.5	_GAL.			1	0.041		
D						1.25	0.064		
Purge De	vice: BES	ST PANA	HEA ZO	Ũ	-	2	0.163		
						4	0.653	]	
					SAMPLE	DATA			
Date: 2	21/17	Temp.	Cond.	DO	DH	ORP	Turbidity	~	
Time: /	600	°C	mS/cm	mg/L	su	mV	NTU	Other: DTW	Color / Odor / Comments
Method:	au FLUW,								
	V OLOMPE				FIELD PARA	METERS			
Time	Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	Other De	
ime	(gals)	°C	mS/cm	mg/L	SU	mV	NTU	Otner:/ <u>J76~</u>	Color / Odor / Comments
1600	7.3	10.63	0.575	6.81	7.47	228.7	3.14	134,2	CLEAR, OPORLESCIESS
1610	7.8	10.70	0.512	6.99	7.47	228,8	4.17	136.2	
1620	8,3	10.62	0.576	7.72	7.46	221.3	3.96	136,2	
1630	8.8	10.68	0.577	7.18	7.46	221,8	2.39	136.2	
1640	9.3	10.50	0.517	7.57	7.47	219.3	2.12	136,2	
1650	9.8	10.18	0.578	9,90	7.47	224.0	2.32	136.2	1
1000	10.3	10.17	0.518	7.64	7.49	216,0	1.86	136.2	
1120	11,5	10,15	0.518	7.51	7.49	215.9	1.52	136,6	FUMPOR
		2							
Sample in	formation: meth	od, container	number, size	, and type, p	reservative us	ed.			
	Ana	llysis		Prese	ervative	(	Container requirer	nents	No. of containers
PFL U	SEPIA 53	7/menIFT	ED	ICE		150 m	1 HOPE		2
		7							
		011 07850 him a second of the sec							
	ne/Notoe	1			1		,		l
Cheervatic	MOINDICO.	0 sec (10	) see d	ischarge	Incher	~ @ 8	15/90 PSI.	NO-FLO	THIZO CELL
Observatio	1	1		VOC Readi	na: 🔿 🔿 -		OVENFLO	W CONTIN	JUOUS REARINES
Observatic	rt Time: 2 2	17 1200	~			ih	to PREU	ENT APPI	TIONAL
Observatio Pump Sta	rt Time: ∠(͡zı	(17 120)	>		INDII Nee e				
Observatic Pump Sta Pump Dep	rt Time: $2(z)$	(17 120. BOTTOMOF	PUMP		wellneed		HEAD P	RESSUME	FIZOM RESTUZE
Observatic Pump Sta Pump Dep	rt Time: $2(z)$	(17 120. BOTOMOF	PUND	1	Well Need	0	HEAD P WATER	LINE.	Fizon RESTUZION
Observatic Pump Sta Pump Dep Sample /T	rt Time: 2(2) oth: \50`;	(17 120. Bottomof	PUND	2/	Well Ner 100	WI-C	HEAD P WATELL	LING.	Fizon RESTUZDOT
Observatic Pump Sta Pump Dep Sample /T VIS/MSD	rt Time: 2 (2) oth: \50' 'ime: NA-	(17 120) BOTIOMOF	PUMP	Z /	Well Ne. 100	WI-C	HEAD P WATER	IZESSONE	- Fizon RESTUZDOT
Observatic Pump Sta Pump Dep Sample /T MS/MSD Signature(	rt Time: $2(z_1)$ oth: $150^{\circ}$ ime: NA s):	BOTTOMOF	PUMP	Z /	Well No.: NA		HEAD P WATER	LINE.	- Fizom RESTUZE
Observation Pump Sta Pump Dep Sample /T MS/MSD Signature(	rt Time: $2(z_1)$ oth: $150^{\circ}$ ime: NA s):	BOTOMOF	Pino	2   I	Well Ne.: NA	WI-C	HEAD P WATER	IZESSONE	- Fizon RESTUZE



				GROUNDW	VATER SAMP	LING DATA	SHEET			
Client:		NAVFAC		Pro	ject Number:	670	1586 . 69. F	1. WI	PAGE	OF 2
Location:	OLF-CO	UPEVILLE, V	JA	-	Well ID:	WI-CV	-MWI3M			
Event:	GW SA	MPLININ EV.	ENT 1		Sample ID:	WI-CV-	-GW13M-62	17		
Date:	02/22	רון	_	Sar	npling Team:	M.EN	100			
Weather:	MODILY SU	WAY, 40'50	F, NW wi	DS @ 41-6	nph					
Total Dept	th:	187.5	FT.(BTOC)			Me	easuring Device:	SOLOWIST	425273, MULTI RAE	. <u>(</u> c 10
Depth to v	vater: (	-) 128.62	_FT.(BTOC)				Date and Time:	62/22/17		
Water Col	umn:	59.48	FT.			r	1	1 HOLISA	1-77 (C107267)	
	<u>    (</u>	x) 0.163	GAL/FT.			Well Dia.	Volume			
Well Volur	me: _	9.64	GAL.			(inches)	(gallons/foot)	-		
Total Purg	je Vol.: _	5.5	_GAL.			1	0.041	-		
_			luning			1.25	0.064	-		
Purge Dev	/ice: <u>P</u>	ANACEA 20	0(#02675	) + contra	orlen	(2)	0.163	-		
	4	USKY GIR (	ATOZ # 185	12 605 63. 19322	5 X	4	0.653	J		
					SAMPLE	DATA				
Date: A	2/22/17	Temp.	Cond.	DO	Hq	ORP	Turbidity	MULTIRAE		
Time:	16:21	°C	mS/cm	mg/L	SU	mV	NTU	Other: (1/2) or	Color / Odor / Commen	ts
Method: 1	FLOW FLOW	12.47	0.462	6.33	7.81	-71	1.7	- pp		
		+ 0.1	10.01	+A.1	FIELD PARA	METERS		6.6	MOSTLY CLEAR, NO C	Sere
	Purge Vol	Temp	Cond		30. pH	110 OBP	Turbidity	MULTINA		
Time	(gals)	°C	mS/cm	ma/L	SU	mV	NTU	Other: (1) or	Color / Odor / Commen	ts
1511	A. 75	12.63	Q:49)	Q 3.1A	7.68	- 5A	147	(ppn)	SLIGHTLY	070
1514	0.96	12 42	A.477	2 97	7.76	- 64	124	0.0	Mos cloudy, NO DOG	2
1517	1:1	12.51	A.476	2.11	7.77	-77	115	ð. ð	1)	-
1520	1.31	12.35	A-476	2.58	7.83	- 84	148	A.A	11	-
1525	1.54	12.34	B.474	235	7.81	-90	837	0.6	// 1/74/	- 12%
1530	1.79	12.27	A.474	2.77	7.86	~106	73.8	A.6	alocal creat an on	
1535	2.15	12.31	6.472	3.74	7.84	-91	74.7	A.0	11 11	
1540	2.59	12.20	0.470	4.51	7.85	-83	72.8	0.0		-
15.45	2.87	12.10	0.468	4.86	7.84	-77	67.0	A.0	11	-
1550	3.08	12.10	G.467	5.28	7.84	-78	48.6	0.0		-
1556	3.65	12.13	0.466	5.92	7.80	-73	55,1	0.0	i.	-
Sample info	ormation: met	thod, container	number, size,	and type, pr	eservative us	ed.				
	Ar	nalysis		Prese	ervative	0	Container requirer	nents	No. of containers	-
	537 Mos	> '		26	°C	125m	IL POLY H	OPÉ	2	
							• *			
							r. *			
Observatio	ns/Notes:				PU	MP CONT	noi pression	E SETTING		
						$P = \theta \cdot 4$	1657 * 177.5.	125		
Pump Star	t Time: 19	542		VOC Readir	ng: O.Oppm	= 107	1.66ps:			
Pump Dep	th: 177.5	SFtSTUC		FINAL "C	DIN" (DISCHART	= 270 mL	BSEC, "OFF" (1 Imin	RECHARGE) TIM	E = 26 SEC,	
Sample /Ti	me: 162	5				COMPLETE	JAMPLING G	16:30. DT	W= 127.65 FtSTOC.	
MS/MSD	NA			Duplicate ID	No.: No.:	4				



Client:         NAVFAC         Project Number:			SM		GROUND	WATER SAMP	LING DATA	SHEET		
Location:         Well D:	Client:		NAVFAC		- Pro	oject Number:	÷			PAGE 2
Sample D.           Sampling Team.           Weather:           Total Depth:           FT.(BTOC)           Depth to water:           (X)         GAL/ET.           Value         GAL.           Value         Control           Value         GAL.           Value         Control           Value         Control           Value         Control           Value         Control           Value         Control           Value         Station           Time         Control           Value         Station           Time         Control           Value         Station           Time         Control           Value         Station           Time         Control           Value         Station<	Location:				-	Well ID:	WI-CV-	- MWI3M		
Wather:	Date:	-			- Sa	Sample ID: mpling Team:				
Total Depth:       FT.(BTOC)       Measuring Device:         Depth to vater:       ()       FT.(BTOC)       Date and Time:         Wate Column:       FT.       Example       Date and Time:         Water Column:       GALFT.       Well Dia       Volume:         GALFT.       GAL       1       0.041         12.004       GAL       1       0.041         12.004       2       0.163         4       0.653       0.653         Dete:       Temp.       Cond       DO       PH       Turbidity       Other:       Color / Odor / Commen         Method:       Imme       %C       mS/cm       mg/L       SU       mV       NTU       Other:       Color / Odor / Commen         16.0       13.02.1       12.0%       13% PH       1%C PH       Didity       Other f.c., Color / Odor / Commen         16.0       13.02.1       12.0%       0.453 S       7.62, -11.1       12.0.4       0.465 K       0.4         16.0       13.02.4       0.2.0%       7.62, -11.1       -7.2       S7.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4       0.4 <th>Weather:</th> <th></th> <th></th> <th></th> <th>- 00</th> <th>mping ream.</th> <th></th> <th></th> <th></th> <th></th>	Weather:				- 00	mping ream.				
Depth to vater:       ()       FT.       Date and Time:         (x)       GAL/FT.       (gallona/foot)         1       0.041         1.20       0.041         1.20       0.041         1.20       0.041         1.20       0.064         2       0.163         4       0.653         Date:       Temp.         Cond       D0         PHy       NU         Date:       Temp.         "C       mS/cm         mgL       SU         Method:       Image:         Time       "C         "gals)       "C         "C       mS/cm         mgL       SU         Method:       Image:         Time       "Gals"         "gals"       "C         "C       mS/cm         MgL       SU         mgL       SU         Time       "Gals"         "Gals"       "C         "Gals"       "C         Time       "Gals"         "Gals"       "C         SU       0.0453         Time       "Gals"	Total Dep	oth:		FT.(BTOC)			Me	easuring Device:		
Water Column:       F.         (x)       GAL/FT.         Well Volume:       GAL.         1       0.041         1.25       0.064         2       0.163         4       0.653         Turbidity         0       0         0       Purge Device:	Depth to	water: (-)		FT.(BTOC)				Date and Time:		
Well Volume:       GAL.         Total Purge Vol.:       GAL.         Purge Device:       GAL.         2       0.063         4       0.653         2       0.663         4       0.653         2       0.663         4       0.653         2       0.663         4       0.653         4       0.653         5       0.064         2       0.663         4       0.653         1       0.041         1       0.064         2       0.663         1       0.064         2       0.067         1       0.011         1       0.027/642         1       0.027/642         1       0.027/642         1       0.017         1       0.017         1       0.017         1       0.017         1       0.017         1       0.017         1       0.017         1       0.017         1       0.017         1       0.0107         1       0.0107	Water Co	lumn:		_ FT.						
Weil Youlme:	W-II V-I.	<u>(x)</u>		GAL/FT.			Well Dia.	Volume		
Total Purge Politic:       Ock.       1.25       0.041         Purge Device:       1.25       0.064       2       0.183         Date:       Temp.       Cond.       DO       pH       ORP       Turbidity       Other:       Color / Odor / Commen         Method:       *C       MS/cm       mg/L       SU       mV       NTU       Other:       Color / Odor / Commen         *E0.1       ± (25, ±)       ± (25, ±)       ± (25, ±)       ± (25, ±)       ± (25, ±)       ± (25, ±)       MULTICAL         Time       Purge Vol.       Temp.       Cond.       DO       pS ³ pH       MV       NTU       Other (20, -)       Color / Odor / Commen         166 1       3,02       1 2.04       0.445       6.03       7.61       -72       57.4       Ø expression       Color / Odor / Commen         166 1       3,02       1 2.04       0.445       6.33       7.62       -71       1 0 2.0       0.66       /// // // // // // // // // // // // //	Total Bur	me: co.Vol:		GAL.			(inches)	(galions/foot)		
Purge Device:         I.2.3         0.004 4           Date:         Temp.         Cond.         D0         pH         ORP         Turbidity         Other:         Color / Odor / Comment           Method:         *C         mS/cm         mgL         SU         mV         NTU         Other:         Color / Odor / Comment           Method:         *C         mS/cm         mgL         SU         mV         NTU         Other:         Color / Odor / Comment           Time:         *C         mS/cm         mgL         SU         mV         NTU         Other:         Color / Odor / Comment           160 1         3,0.2         12.0-0         0464         6.0-3         7.92         -71         10 2.0         0         -//cm         1616         5.9.4         0.400         //cm         1616         5.9.4         0.400         -//cm         1616         10.1         10.2.0         0         -//cm         1616         5.9.4         0.400         0.400         0.400         0.400         0.400         0.400         0.400         0.400         0.400         0.400         0.400         0.400         0.400         0.400         0.400         0.400         0.400         0.400         0.400	Total Pul	ge voi		GAL.			1 25	0.041		
Image: Control         Image: Control         Sample Data           Date:         Temp.         Cond.         D0         pH         Turbidity         Other:         Color / Odor / Comment           Method:         Image: Cond.         D0         pH         SU         mV         NTU         Other:         Color / Odor / Comment           Method:         Image: Cond.         D0         pH         SU         mV         NTU         Other:         Color / Odor / Comment           Time         Purge Vol.         Temp.         Cond.         D0         SU         mV         NTU         Other:         Color / Odor / Comment           160.1         3.02         12.09         0464         6.35         7.92         -71         1.62.0         0.66         //           161.1         44.62         12.09         0464         6.35         7.92         -71         1.62.0         0.66         //           161.6         5.19         12.06         0464         6.35         7.92         -71         1.62.0         0.6         //           161.1         44.62         12.04         6.33         7.66         -71         1.7         0.6         //           162.1	Purae De	vice:					2	0.163		
SAMPLE DATA           Date:         Temp.         Cond.         DO         pH         ORP         Turbidity         Other:         Color / Odor / Commer           Method:         Image: Sum mgL         Sum mV         NU         Other:         Color / Odor / Commer           Method:         Image: Sum mgL         Sum V         NU         NU         Other:         Color / Odor / Commer           Time         Purge Vol.         Temp.         Cond.         DO         Sv         Pit 30° ORP         Turbidity         Other: (e)/// Other: (e)/// Other: (e)/// Other: (e)//						-	4	0.653		
Date:         Temp.         Cond.         DO         PH         ORP         Turbidity         Other:         Color / Odor / Commen           Method:                Color / Odor / Commen           Method:                Color / Odor / Commen           Time         Purge Vol.         Temp.         Cond.         DO         30 ⁵ pH         31 ⁶ ORP         Turbidity         Other(C_)         Color / Odor / Commen           166 1         3.912         12.09         0.465         6.03         7.81         -72         57.4         0.40         mosrey cetters, ec carres           166 1         3.912         12.09         0.464         6.35         7.82         -71         1.02.0         0.0         mosrey cetters, ec carres           161 1         4-62         12.06         0.464         6.35         7.82         -71         1.7         0.0         mosrey cetters, ec carres           161 1         5.16         12.06         0.462         6.33         7.86         -71         1.7         0.0         mosrey cetters, ec carres           162 1         5						CAMPLE				
Time:         °C         mS/cm         mg/L         SU         mV         NTU [°] Other:         Color / Goor / Commen           Method:                    Color / Goor / Commen           Time         Purge Vol.         Temp.         Cond.         DO         St ⁰ P pH         St ⁰ ORP         Turbidity         Other (c.)         Color / Odor / Commen           166 1         3_912         12.0°9         0.465         6.0°1         7.81         -72         57.4         0.40         Assrct cutor, to care          Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care         Assrct cutor, to care <td>Date:</td> <td></td> <td>Temp.</td> <td>Cond.</td> <td>DO</td> <td>pH</td> <td>ORP</td> <td>Turbidity</td> <td></td> <td><u> </u></td>	Date:		Temp.	Cond.	DO	pH	ORP	Turbidity		<u> </u>
Method:         ± 0.1         ± 0.2 ± 1 ± 2.0 ± 1 ± 2.0 ± 1 ± 2.0 ± 1 ± 2.0 ± 1 ± 2.0 ± 1 ± 2.0 ± 1 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0.0 ± 0	Time:		°C	mS/cm	mg/L	SU	mV	NTU	Other:	Color / Odor / Commen
tell       tell <thtell< th="">       tell       tell</thtell<>	Method:									
Time         Purge Vol. (gals)         Temp. °C         Cond. mS/cm         DO         30° PH         N°         Turbidity mV         MUU         Other (Ac) (PAr.)         Color / Odor / Commen           1666         4.23         12.69         6.464         6.38         7.80         -71         162.0         0.462         6.464         6.38         7.80         -71         162.0         0.462         6.464         6.38         7.80         -71         162.0         0.464         6.464         6.38         7.80         -71         162.0         0.464         6.464         6.38         7.80         -71         9.8.6         0.46         ////////////////////////////////////			±0.1	+0.01 21	+ 05 21	FIELD PARA	METERS			
166 1       3.92       12.09       0.465       6.03       7.81       -72       S7.4       0.0       mostry cleft, to cleft         1666       4.43       12.09       0.464       6.35       7.92       -71       102.0       0.0       7       7       102.0       0.0       7       7       102.0       0.0       7       7       102.0       0.0       7       7       102.0       0.0       7       7       102.0       0.0       7       7       102.0       0.0       7       7       102.0       0.0       7       7       102.0       0.0       7       7       102.0       0.0       7       7       102.0       0.0       7       7       102.0       0.0       7       7       102.0       0.0       7       7       102.0       7       7       102.0       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7<	Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	30° pĤ SU	ORP מי mV	Turbidity NTU	Other: (1.) or (000)	Color / Odor / Commen
1606       4.33       12.0°       0.464       6.36       7.92       -71       102.0       0.0       //         1611       4.62       12.08       0.464       6.40       7.83       -72       114       0.0       //         1616       5.1%       12.08       0.463       6.35       7.80       -71       98.6       0.0       //         1621       5.%       12.07       0.462       6.33       7.81       -71       1.7       0.0       //         1621       5.%       12.07       0.462       6.33       7.81       -71       1.7       0.0       //         1621       5.%       12.07       0.462       6.33       7.81       -71       1.7       0.0       //         PAnANETELS       57.0842       70.04       10       10       10       10       10         Sample information: method, container number, size, and type, preservative used.       Container requirements       No. of containers	1601	3.92	12.09	0.465	6.07	7.81	-72	59,4	0.O	MOSTLY CLEAR, NO COOP
1611       4.62       12.08       6.464       6.40       7.63       -72       114       6.6       7         1616       5.19       12.06       0.463       6.35       7.66       -71       98.6       0.0       7         1621       5.5       12.07       0.462       6.33       7.61       -71       1.7       6.0       7         1621       5.5       12.07       0.462       6.33       7.61       -71       1.7       6.0       7         1621       5.5       12.07       0.462       6.33       7.61       -71       1.7       6.0       7         1621       5.5       12.07       0.462       6.33       7.61       -71       1.7       6.0       7         1621       5.7       7.62       7.65       5.4       7       6.0       7       7         1621       5.7       7.62       5.4       7       6.0       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7<	1606	4.23	12.09	0.464	6.38	7.82	- 71	102.0	0.0	11
1616       5.19       12.06       0.463       6.35       7.86       -71       98.6       0.6       11         1621       5.5       12.07       0.462       6.33       7.86       -71       1.7       0.0       11         P4AAM&TELS       57.9642       0.33       7.86       -71       1.7       0.0       11         P4AAM       1642       5.7       9642       6.33       7.86       -71       1.7       0.0       11         P4AAM       1642       5.7       9642       0.33       7.86       -71       1.7       0.0       11         P4AAM       1642       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10	1611	4.62	12 . 08	0.464	6.40	7.83	- 72	114	0.0	//
1621       5.5       12.67       6.462       6.33       7.61       -71       1.7       6.8       //         PArAMETELS       57-9645       ProceEED       50       54-44445       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -<	1616	5,19	12.06	0.463	6.35	7.80	-71	98.6	0.6	11
PARAMETELS       STABLE, PROCEED TO SAMULE	1621	5.5	12.07	0.462	6.33	7.81	-71	1.7	0.0	/1
Image: Second		PARAMET	ELS ST	ABLE, PI	lockels	TO SAM	12			
Image: Sample information: method, container number, size, and type, preservative used.     Image: Sample information: method, container number, size, and type, preservative used.       Analysis     Preservative     Container requirements     No. of containers       Image: Sample information: method, container number, size, and type, preservative     Container requirements     No. of containers       Image: Sample information: method, container number, size, and type, preservative     Container requirements     No. of containers       Image: Sample information: method, container number, size, and type, preservative     Image: Sample information: requirements     No. of containers       Image: Sample information: method, container number, size, and type, preservative     Image: Sample information: requirements     No. of containers       Image: Sample information: method, container number, size, and type, preservative     Image: Sample information: requirements     No. of containers       Image: Sample information: method, container number, size, and type, preservative     Image: Sample information: requirements     No. of containers       Image: Sample information: method, container number, size, and type, preservative     Image: Sample information: requirements     Image: Sample information: sample informatio										
Image: Sample information: method, container number, size, and type, preservative used.     Container requirements     No. of containers       Analysis     Preservative     Container requirements     No. of containers       Image: Sample information: method, container number, size, and type, preservative     Container requirements     No. of containers       Image: Sample information: method, container number, size, and type, preservative     Container requirements     No. of containers       Image: Sample information: method, container number, size, and type, preservative     Image: Sample information: method, containers     No. of containers       Image: Sample information: method, container number, size, and type, preservative     Image: Sample information: method, containers     No. of containers       Image: Sample information: method, container number, size, and type, preservative     Image: Sample information: method, containers     No. of containers       Image: Sample information: method, container number, size, and type, preservative     Image: Sample information: method, containers     Image: Sample information: method, containers       Image: Sample information: method, container number, size, and type, preservative     Image: Sample information: method, containers     Image: Sample information: method, containers       Image: Sample information: method, container number, size, and type, preservative     Image: Sample information: method, container     Image: Sample information: method, container       Image: Sample information: method, container     Image: Sample informat										
Sample information: method, container number, size, and type, preservative used.       Analysis     Preservative     Container requirements     No. of containers       Image: Image					1					
Sample information: method, container number, size, and type, preservative used.       Container requirements       No. of containers         Analysis       Preservative       Container requirements       No. of containers										
Analysis Preservative Container requirements No. of containers   Analysis Preservative     Container requirements No. of containers     Image: Container requirements No. of containers  <	Sample in	formation: metho	od, container	number, size,	and type, pr	reservative use	d.			
Image: Second		Alla	iysis		Prese	ervative	Ĺ	container requirem	ients	No. of containers
Image: Second										
Image: Second										
Observations/Notes: Pump Start Time: VOC Reading: Pump Depth:										
Observations/Notes: Pump Start Time: VOC Reading: Pump Depth:										
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Pump Start Time: VOC Reading: Pump Depth:	Observatio	ons/Notes:								
Pump Start Time: VOC Reading: Pump Depth:										
Pump Depth:	Pump Sta	rt Time:			VOC Readi	ng:				
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Client: $ \underbrace{MQRAC}_{QAUS_DAUS_AUA}_{QAUS_DAUAS_AUA}_{QAUS_DAUAS_AUA}_{QAUS_DAUAS_AUA}_{QAUS_DAUAS_AUA}_{QAUS_DAUAS_AUA}_{QAUS_DAUAS_AUA}_{QAUS_DAUAS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}_{QAUS_AUA}$			314		GROUNDW	ATER SAME	LING DATA	SHEET			
$ \begin{array}{c} \mbox{Location} & \mbo$	Client:		NAVFAC		Pro	ject Number	6795	80.09.Fl.w	2		
Event:         GAU SANDLAGE GUEST 1         Sampling Text         Maint (Sampling Text)           Weather         Movert Salanty, MOVE, SE wordt 00 + 6 kpt         M. Excol           Total Depth:         1.40 $\cdot 0^{-1}$ FL(BTOC) Statistics 1: 100 - 100 kpt         Maint (Sampling Text)           Vell Youns:         (A) 134, 55         FL(BTOC) Statistics 1: 120 - 100 kpt         Maint (Sampling Text)         Maint (Sampling Text)           Vell Youns:         (A) 134, 55         FL(BTOC) Statistics 1: 120 - 100 kpt         Maint (Sampling Text)         Maint (Sampling Text)           Vell Youns:         (A) 134, 55         FL(BTOC) Statistics 1: 120 - 100 kpt         Maint (Sampling Text)         Maint (Sampling Text)           Vell Youns:         (A) 134, 55         FL(BTOC) Statistics 1: 120 - 100 kpt         Maint (Sampling Text)         Maint (Sampling Text)           Vell Youns:         (A) 2.70         GAL         Sampling Text)         Maint (Sampling Text)         Maint (Sampling Text)           Vell Youns:         (A) 134, 55         FL(BTOL)         Maint (Sampling Text)         Maint (Sampling Text)         Maint (Sampling Text)           Vell Youns:         (A) 12, 50           Time:         (1) 15, 70         (A) 12, 70         (A) 12, 70<	Location:	OLF- COL	PEVILLE, 1	NA		Well ID	WI-CV.	-MW86S			
Date: $(2/2a/1^{-2})^{-1/2}$ Sampling Team:         (-Y, E, SAGO           Weather: $(1/2a/1^{-2})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$ $(0^{-1})^{-1/2}$	Event:	GW SAMDI	LING EVEN	1 70	_	Sample ID	WI-CV	-Gw065-0	217		
Weather:       Moster:       Sector:       No. 5 and:       Measuring Device:       Social Science of Machine Science of Machi	Date:	02/22/17		_	Sar	npling Team	M. ENC	20			
	Weather:	MOSTLY SUN	4NY, 400F	SE WIND	@ 4- 8mpl	<b>h</b>					
	Total Dep	th: 1	40.0	FT.(BTOC)	SCREEN:	130-140F	Hoss Me	easuring Device:	SOLOWIST #	25273 M.1.7: P.AE	(0102922)
Writer Column:       5.9.5       FT.         Woll Volume:       G.0.2       GAL/FT.       Well Volume:       Inches)       Igainsmooth         Total Purge Vol:       2.0       GAL       Servet volut = 2.47 Ferstle       Well Volume:       Inches)       Igainsmooth         Purge Device:       Purge Collect = 2.00       PE3.5475 + Contracuest       Inches)       Inches)       Igainsmooth         North Collect = 7.00       PM       SAMPLE DATA       Moltine: (with the collect = 2.42, 2.2, 1/2, 1/2, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.6, 1/2, 2.7, 1/2, 2.6, 1/2, 2.6, 1/2, 2.7, 1/2, 1/2, 2.6, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2/2, 1/2, 2	Depth to v	water: (-)	134,95	FT.(BTOC)	NO SO	MP.	•	Date and Time:	02/22/17	A940	
Weil Volume: $(B, Q, L_3^{-1/2})$ GAL $Z_{2} = Q$ GAL       Weil Dia.       (Volume) $Holk 15^{A}$ $O = 22$ $(C = 0.2397)$ Purge Device: $Q_{abance A}$ $2Q_{2} = P_{2}2b^{TS} + (carreauce)$ $(Q = 0.168)$ $Q = 0.168$ $Q = 0.168$ Purge Device: $P_{abance A}$ $2Q_{2} = P_{2}2b^{TS} + (carreauce)$ $(Q = 0.168)$ $Q = 0.168$ Date: $Q = 2/22_{2}/1.7$ Temp.       Cond.       D0       PH       OPP       Turbidity       Obstrift (M = 0.067)       Obst	Water Col	umn:	5.05	FT.					0 21 - 111	01.0	
Well Volume: Total Purge Vol: 2.4° GAL Purge Device: Purge Device: Purge Device: Purge Device: Purge Device: Purge Device: Purge Device: Purge Device: Purge Coult of a count state of the Sector Purge Device: Purge Vol: Time: (1757 Count of the Sector Purge Vol: Time: (1757 Count of the Sector Time: (1757 Count of the Sector		(x)	A.163	GAL/FT.			Well Dia.	Volume	HORIBA U	-22 (C102397)	
Total Purge Vol: $2, \partial$ GAL       1       0.041         Purge Device: $p_{outhors A - 200} + p_{2,b} + f_{3,c} + u < b < 50 < x < x < x < x < x < x < x < x < x < $	Well Volu	me: <u>(</u>	9.82	GAL. 3 w	ELL VOL = 2	47641	(inches)	(gallons/foot)	ti)		
Purge Device: $P_{Decket R} : 2 \cos^{-\frac{1}{2}} \cos^{-\frac{1}{2$	Total Purg	ge Vol.:	2.0	GAL.	-	CP CP CP	1	0.041	1		
Purge Device: $P_{0AbACG A 200} H_{02}b^{15} + (corrected)$ Image: Correction 4: US 5037x         Date: $O_{2}/2_2/1,7$ Temp.       Cont.       DO       PH       OHP       Turbidity       Other:       Color / Odor / Odor / Comments         Date: $O_{2}/2_2/1,7$ Temp.       Cont.       DO       PH       OHP       Turbidity       Other:       Color / Odor / Odor / Comments         Date: $O_{2}/2_2/1,7$ Temp.       Cont.       DO       PH       OHP       Turbidity       Other:       Color / Odor / Comments         Time:       1/375       % C       Model       2.9.1       2.9.2       7.28       2.61       0.6       Color / Odor / Comments         Time:       (gals)       °C       Model       2.9.7       7.28       2.61       0.60       0.00       0.00       7.97       1.92       0.60       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00				-			1.25	0.064			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Purae Dev	vice: Pa.	Acca 200	#82675-	CONTRALE	1 ·	(2)	0.163			
Non-2014 Generating the formation of the format	J	(-)u	ISKY AIR I	· UMDRESSON	# U8563	38	4	0.653			
SAMPLE DATA           Date: $\partial_{\mathbb{C}} 2/22/1, 7$ Tomp.         Color / Don / Comments           Time: $(1357)         Color / Odor / Comments           Time: (1357)         Color / Odor / Comments           Time: (12.5^{16})         Color / Door / Comments           Time: (2001)         2 (2.92)         Color / Odor / Comments           Time: (2001)         Time: (2001)         Color / Odor / Comments           Time: (2001)         Time: (2001)         Color / Odor / Comments           Time: (2001)         Time: (2001)         Time: (2001)         Time: (2001)         Color / Odor / Comments           Time: (2001)         Time: (2001)         Time: (2001)         Color / Odor / Comments           Time: (2001)         Time: (2001)         Time: (2001)         Color / Comments           Time: (2001)         Time: (2001)         Time: (2001)         Colspan="2"           Time: (2001)         Time: (2001)           $		Ho	NDA GENE	ATOL # 10	50322			0.000			
Date: $22/3_2/1.7$ Temp.         Cond.         D0         pH         ORP         Turbidity         NUT						SAMPLE	DATA				
Time:       1/35"       *C       ms/cm       mg/L       SU       mV       NTU       Unit:       Unit: <thunit:< th="">       Unit:       Unit:</thunit:<>	Date: 07	122/17	Temp.	Cond.	DO	pН	ORP	Turbidity	MULTIPAZ		
Method:       Low Flow       12.5%       6.5%       2.95       7.28       261       6.6       6.6       Clean processor         Time       Purge Vol.       Temp.       Cond.       DO       5%       Purple       Vitility       Purple       Color / Comments         10:55       An       9.67       6.617       7.42       6.72       2.11       6.60       6.0       Clean processor       Color / Odor / Comments         11:55       1.0       11.30       6.611       3.47       6.72       2.27       6.70       6.70       Clean processor       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00       7.00	Time: 1	155	°C	mS/cm	mg/L	SU	mV	NTU	Other: (%)	Color / Odor / Comm	ents
$ \frac{1}{1100} \frac{1}{100} $	Method:	LOW FLOW	12.56	0.596	2.95	7.28	241	0.G	(ppr)		
Time       Purge Vol.       Temp.       Cond.       DO       Storp       Turbidity       Multiplicy		2000	+ 0.1	+ 9 (9)	+ + . 2		METERS	The state of the state	0.0	CLEAR, NO ODOR .	
Time       Topological       Topological       Topological       Topological       Topological       Control (Control (Contro (Control (Control (Contro		Purge Vol	Tomp	Cond		150° nH	1219 BP	Turbidity	MULTIRAE	I	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Time	(gals)	°C	mS/cm	mg/L	SU	mV	NTU	Other: (1.) or	Color / Odor / Comm	ents
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1055	NA	9.87	A.617	7.42	6.07	241	6.0	(),t)	CIEAR NO 0002	Drain 24 9
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1115	1.0	11.30	0.611	3.47	6.72	221	A.A	Ait	II II	<u>)</u> [0213401
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1120	1.09	11.87	A.605	2.99	6.91	220	A.A	G.0	1.	
Instruction       Instruction <thinstruction< th=""> <thinstruction< th=""></thinstruction<></thinstruction<>	11-0	1.22	12.03	0.605	2.88	TANY	215	A.A	AA	<i>j1</i>	
Doc       Doc <thd< td=""><td>1130</td><td>1.30</td><td>11.82</td><td>0.682</td><td>2.91</td><td>7.11</td><td>212</td><td>A.G</td><td>0.0</td><td>21</td><td></td></thd<>	1130	1.30	11.82	0.682	2.91	7.11	212	A.G	0.0	21	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1135	1.42	12.06	0.599	2.85	7.16	209	A.A	0.0	11	_
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1140	1.48	12.22	0.600	2.88	7.01	206	A.O	G.6	)/	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1145	1.63	12.47	0.597	2 88	7.24	204	Q.Q	0.0	71	
InstructureInstructureInstructureInstructureInstructureInstructureSample information: method, container number, size, and type, preservative2010.00.011Sample information: method, container number, size, and type, preservativeContainer requirementsNo. of containersSample information: method, container number, size, and type, preservativeContainer requirementsNo. of containersSample information: method, container number, size, and type, preservativeContainer requirementsNo. of containersSample information: method, container number, size, and type, preservativeContainer requirementsNo. of containersSample information: method, container number, size, and type, preservativeContainer requirementsNo. of containersSample filme: $4 - 1$ $4 - 1$ $4 - 1$ Sample filme: $16 \pm 25$ VOC Reading: $0.0 ppm$ $p = 0.4657 \times 138 \div 25$ Pump Depth: $138.000000000000000000000000000000000000$	1150	1.83	12.46	0.596	2.88	7.17	2007	0.0	6.6	11	
Phramitian       Stragety       Processor for sequence       Preservative       Container requirements       No. of containers         Sample information: method, container number, size, and type, preservative used.       Analysis       Preservative       Container requirements       No. of containers         537       Mob $\leq 6'c$ $(25mL Poly Hopg)$ $Hopg$ $Hopg$ Observations/Notes:       PUMp (c,Jtrack Passores Settrink6 : P = 0.41651 × 138 + 25       Pump Start Time: 16: 25       VOC Reading: $0.0ppm$ $= 89.27 ps;$ Pump Depth:       138.6 Ffb Tocc       FIMAL "ON" (Discurrack) time = 656cc. "ore" (Recurrack)) TIME = 55cc. $= 05cc mack = 71mk^2 - 12: 15 + 51mak = 13ch	1155	2.0	17.50	0.596	2.95	7.2.8	261	A.6	A.17	11	
Sample information: method, container number, size, and type, preservative used.         Analysis       Preservative       Container requirements       No. of containers         537       Mob $\angle 6^{+}C$ $125mL$ $PoLY$ $Hopg$ $H$ 537       Moh $\angle 6^{+}C$ $PoLY$ $PoLY$ $PoLY$ $Hopg$ $H$ 0       Secondarian $PoLY$ <td>D</td> <td>ALANGTUS</td> <td>STABL</td> <td>PROCE</td> <td>ED TO SA</td> <td>MPLE</td> <td>201</td> <td></td> <td></td> <td></td> <td></td>	D	ALANGTUS	STABL	PROCE	ED TO SA	MPLE	201				
AnalysisPreservativeContainer requirementsNo. of containers537Mob $\angle 6^{+}\angle$ $(25mL PoLy Horg\angle 411111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111<$	Sample inf	ormation: metho	od. container	number, size	, and type, pr	eservative us	ed.				
$\frac{537 \text{ Mob}}{26^{\circ}} = \frac{26^{\circ}}{25^{\circ}} + \frac{125^{\circ}}{125^{\circ}} + \frac{100}{100} = \frac{14}{100} + \frac{14}{100} = $		Ana	lvsis	1	Prese	rvative		Container requirer	nents	No. of containers	
Solid FieldNoteObservations/Notes: $p_{UMP} (e_iJTROL Pressource servinde:P = 0.4657 \times 138 \pm 25Pump Start Time: 16:25VOC Reading: 0.0P_{Pm}Pump Depth: 138.0 Ftb TocFINAL "ON" (Dischardse) TIME = 6sec. "off" (Rechardse)TIMEDischardse RATE 97 mL/minSample /Time: 12:05END SAMPLE TIME = 12:15. FINAL DTW = 134. 95 FtbSignature(s):$		537 MOD			160		1.2	15ml POLY	HDPC	4	
Observations/Notes: $PUMP (c_i, JTROL PRESSURE SETTIME:Observations/Notes:PUMP (c_i, JTROL PRESSURE SETTIME:Pump Start Time:16325Pump Depth:138.6Ftb TocSample /Time:123.65Sample /Time:123.65Duplicate ID No.:WI = CV - G_W B(S/SP - 0217)Signature(s):Sample (S):$									1.010		
Observations/Notes: $PUMP (c_1JTROL PRESSURE SETTING E)$ Pump Start Time: 10:25VOC Reading: $0.0ppm$ Pump Depth: 138.6FtbTocFINAL "ON" (DISCHARGE) TIME = $6SEC$ . "OFF" (RECHARGE) TIMESample /Time: 12:05END SAMPLE TIME = $12:15$ . FINAL DTW = $134.95Ftb$ MS/MSDDuplicate ID No.:Signature(s):DUPLOW DECLARD (S)									_		
Observations/Notes: $PUMP (c_1JTROL PRESCURE SETTING :P = 0.4657 \times 1387 25Pump Start Time:18:25VOC Reading:0.0 PPmPump Depth:138.0 Ff b TocFINAL "ON" (Discurred of the Edsec. "off" (RECHARGE) TIMEDiscurred of the Edsec. "off" (RECHARGE) TIME25 \leq cSample /Time:12:05End Sample Time:12:05Imal DTW=Duplicate ID No.:WI^-CV - G_W & C(S/SP - 0217)Sample TIME = 1105]Signature(s):Duplicate ID No.:WI^-CV - G_W & C(S/SP - 0217)Sample TIME = 1105]$											
Observations/Notes:       PUMP (G)JTROL PRESSURE SETTING !         Part Time:       18:25         Pump Start Time:       18:25         VOC Reading:       0.0 ppm         =       89.27 psi         Pump Depth:       138.6 Ff b Toc         FINAL "ON" (Discharder) time = 65 ec. "off" (Rechardre) Time         Discharder RATE = 97 ML/min         Sample /Time:       12:05         MS/MSD       Duplicate ID No.:         Signature(s):       Dischardes /SP - 0217											-
Observations/Notes:       PUMP (CIJTROL PRESSURE SETTING: P= 0.4657×138725         Pump Start Time:       18:25         VOC Reading:       0.0 Ppm         =       89.27 psi         Pump Depth:       138.6 Ffb Toc         FINAL "ON" (Discurrance) TIME = 65EC. "OFF" (RECHARGE) TIME         Sample /Time:       12:05         MS/MSD       Duplicate ID No.:         Signature(s):       WI-CV-GWEGS/SP-0217 [SAMPLE TIME = 1105]									Second and the second		
Observations/Notes:       PUMP CONTROL PRESSURE SETTINGE         Pump Start Time:       18:25         Pump Depth:       138.6Ftb Toc         FINAL "ON" (DISCHARGE) TIME = 65EC. "OFF" (RECHARGE) TIME         Sample /Time:       12:05         MS/MSD       Duplicate ID No.:         Signature(s):       Discharte(s):						i.					
Pump Start Time: $132.25$ VOC Reading: $0.0 ppm$ $P = 0.4657 \times 138 \div 25$ Pump Depth: $138.6Ftb Toc$ $FINAL "ON" (DISCHARGE) TIME = 65EC. "OFF" (RECHARGE) TIMEDischarde RATE =97M^{L}/min25cecSample /Time:12:05END SAMPLE TIME = 12:15.FINAL DTW = 134.95FtGMS/MSDDuplicate ID No.:WI = CV - GWEGS/SP - 0217Sample TIME = 1105]Signature(s):Signature(s):Signature(s):Signature(s):$	Observatio	ons/Notes:					P	UMP CONTROL	PRESSURE S	ETTING =	
Pump Start Time:       18:25       VOC Reading:       0.0 ppm       = 89.27 psi         Pump Depth:       138.6 Ff b loc       FINAL "ON" (Dischardse) time = 65 ec. "off" (Rechardse) TIME = 05 ec.       05 ff (Rechardse) TIME = 05 ec.         Sample /Time:       12:05       END SAMPLE TIME = 12:15 . FINAL DTW = 134.95F167         MS/MSD       Duplicate ID No.:       WI-CV - GWEGS/SP-0217 [SAMPLE TIME = 1105]         Signature(s):       Signature(s):							1	2= 0.465	7×138+ 2:	5	
Pump Depth:       138.6Ftb Toc       FINAL "ON" (DISCHARGE)TIME = 6SEC. "OFF" (RECHARGE) TIME:         Sample/Time:       12:05       DISCHARGE RATE = 97ML/min       25SEC         Sample/Time:       12:05       END SAMPLE TIME = 12:15. FINAL DTW = 134.95Ftbp         MS/MSD       Duplicate ID No.:       WI-CV - GWEES/SP-0217       [SAMPLE TIME = 1105]         Signature(s):       Signature(s):	Pump Sta	rt Time: 16:	25		VOC Readir	Ig: O.Oppi	'n	= 89.27	ps1		
Pump Depth: 138.6Ftb Toc       FINAL "ON" (DISCHARGE) TIME = 6SEC. "OFF" (RECHARGE) TIME         Sample /Time: 12:05       DISCHARGE RATE 97ML/MIA         Sample /Time: 12:05       END SAMPLE TIME = 12:15. FINAL DTW= 134.95Ftbj         MS/MSD       Duplicate ID No.:       WI-CV-GWEGS/SP-0217 [SAMPLE TIME = 1105]         Signature(s):       Signature(s):						11		202 000 040			
Sample /Time: 12:05       Dischartic RATI:= 97ML/min       25520         Sample /Time: 12:05       END SAMPLE TIME = 12:15 . FINAL DTW= 134.95FHG       25520         MS/MSD       Duplicate ID No.: WI-CV-GWEGS/SP-0217       Sample TIME = 1105]         Signature(s):       Signature(s):       Signature(s):	Pump Dep	oth: 138.6	Ftbiloc				FIN.A	L "ON" (DISCHA	nise) + 1 me = 6s	EC. "OFF" (RECHA	262) TIME
Sample/Time:         12:05         END SAMPLE:         TIME = 12:15         FINAL DTW = 134.95F161           MS/MSD         Duplicate ID No.:         WI-CV-GWEGS/SP-0217         [SAMPLE: TIME = 1105]           Signature(s):         Signature(s):         Signature(s):         Signature(s):							DISCH	ARGE RATE =	97ml/min		25526
MS/MSD Duplicate ID No.: WI-CV-GWE6S/SP-0217 [SAMPLE TIME = 1105] Signature(s):	Sample /T	ime: 12:05	S				END	SAMPLE TIM	4= 12:15	FINAL DTW=	134.95F+6
Signature(s):	MS/MSD				Duplicate ID	No .: Wi	-CV-GW	1065/SP-02	17 ESAMPLE	TIME = 11057	
	Signature(	s):									



0

				GROUNDV	VATER SAMP	PLING DATA	SHEET			
Client:		NAVFAC		Pro	ject Number		679.588	679580.	69. FI. WI	- <
Location	: OLF- CO	UPENILLE, WAR	)	_	Well ID	: HWO	WI-CV-MU	JOEM		_
Event:	GW SAN	VLING EVEN	т I	_	Sample ID	WI-CV-G	WOGM-0217	WI-CV-GWE	6M -0217-MS, WI-CU-0	GWEEH
Date:	02/21/20	17	_	Sar	npling Team	MARK &	ÉMOD	-	·	_
Weather:	MOSTER SU	INNY, MID 4	10°5, NW w	1.005 6 2-6.	uph .					_
Total Dep	oth:	189.0Ft	FT.(BTOC)			Me	easuring Device:	SOLINST WLT	(23772)	
Depth to	water:	(-) 145.35	FT.(BTOC)	F144.92F	thrat int a	อ. อ	Date and Time:	02/21/17	1194	- 3
Water Co	olumn:	43.65	FT.	h.,		in have		12.1	Company l	-
		(X) 0-163	GAL/FT.			Well Dia.	Volume	MULTIL	(C102922)	
Well Volu	ume:	7.11	GAL.			(inches)	(gallons/foot)	HORIBA	U-22 (C102387)	
Total Pur	rge Vol.:	3.0	GAL.			1	0.041			
						1.25	0.064	1		
Purge De	evice:	PANACEA 200	+ Pomp row	TRUCER (	#82675)	2	0.163	]		
		HUSKY AM CON	mpnissen.			4	0.653			
						22				
					SAMPLE	DATA				
Date: 0	2/21/2017	Temp.	Cond.	DO	pH	ORP	Turbidity	Other: C/.) or	Color / Odor / Comments	
Time:	14:17	°C	mS/cm	mg/L	. SU	mV	NTU	(200)		-
Method:	Low-FLOW	~ 11.65	0.634	6.81	7.08	-95	0.0	0-6	CLEAR, NO COON	
		.70.1		20.0521	FIELD PARA	METERS				1
Time	Purge Vo	I. Temp.	Cond.	DO	±° pH	1 ORP	Turbidity	Other (%)an	Color / Odor / Commente	
	(gals)	°C	mS/cm	mg/L	SU	mV	NTU	(Prm)		
1328	NA	12.55	0.679	2.45	6.32	-46		6.0	MOSTLY CLEAR, NO ODOR	and =
1405	2.5	12.17	0.632	6-98	7.02.	- 93	0.0	6.6	CLEAR, NO COON	145.
1408	2.58	11.86	0.637	0-89	7.04	-93	0.0	0.0	11	_
1411	2.69	11.75	0.636	0.84	7.05	-94	ê.0	0.0	11	-
1414	2.82	11.69	0.635	0.82	7.06	-44	0.0	6.6	11	-
1417	2.91	11.65	0.634	0-81	7.08	- 95	0.0	0.0	71	-
Ŷ	ANAMETE	NS STABL	E, PROC.	ED TO S	A MPLE_					-
										-
										-
										-
Sample in	formation: m	athod container	number size	and type pr	recenvative us	ed.				
bampie ii		Inalysis	Humber, Size	Prose	eservativo		Container requirer	nente	No. of containors	
	537 040	11a1y313		11636	*r	175			L L	
	301 700				L .			DPE	0	•
							Ż			
								/		1
										1
Observati	ons/Notes:					L	FIRAL B SCA	EEN INTERV	AL: 174-184 Ftber	1
PTW M	EASCHEEMENT	ts taken w	1 PUMP IN "	seel.			Sur	P DEOTH : 18	9 Ft bas	
oump Sta	art Time: 1	2:28		VOC Readin	ng: 0.0 p	pn	PRESSURE SE	FFINCS :		
					1	471	= 0.46	57*179 + 2	2	
Pump De	pth: 179	.0 Ftb Toc			х.	-	= 108.	36 pst	Line Euro "Au"/Au	CHAPLE
						FIN	DAL "OFF" (REC	HARGE TIME =	HOSEC, TWAL ON WIS	9 SEC.
Sample /	Time: 14:	25		1			END SAMP	LING @ 142	8. FINAL DTW: 145.45	FHIT
VIS/MSD	YE5:	1 0 1		Duplicate ID	No.: NA					
line ature	(s) Ma	I Emb								

A,



~ 2 *		2/	<b>AA</b> .								
			SM SM		GROUNDW	ATER SAM		SHEET			
	Client:		NAVFAC		Pro	ject Number	67959	BAS. FLW	/1	PAGE LOG 1	1
$\bigcirc$	Location:	OLF-	COUPEVILLE	WA		Well ID	WI-CV	-MWB9M		11100 1871	-
$\bigcirc$	Event:	GW SA	MPLININ ED	ENT )	-	Sample ID					-
	Date:	0212	3/17		San	npling Team	M. END	00			
	Weather:	MUSTLY .	SUNNY, LOW	HO'SOF, ESE	W.NO 62.	-YMPL					_
	Total Dent	·h·	107 0	FT (BTOC)			M	easuring Device:	S. Int	25772)	A 10.00-
	Depth to w	vater:	(-) 126 CF	ET (BTOC)				Date and Time:	SOLONISI (	20275), MULTIATE	_ 10 2 17
	Water Colu	umn:	17A 45	FT.				Date and Time.	0 2/23/1	13:28	-
	mator oon		(x) G.163	GAL/FT.			Well Dia	Volume	HORIBA 1	U-22 (C102387)	
	Well Volur	ne:	11.48	GAL			(inches)	(gallons/foot)		Cert To	
	Total Purg	e Vol.:	6.52	GAL.			1	0.041			
	· • • • • • • • • •	je vem	0.52	_			1.25	0.064			
	Purge Dev	vice:	RANDIGO DI	(482(89)	FONTALL	ЕЛ		0.163			
			HUSILY AIR C	omp. (UESG	33%)	-	4	0.653			
			HONDA GENE	AATOR (165	18322)		L	0.000	l		
						SAMPLE	DATA				
	Date:	1	Temp.	Cond	DO	DH	ORP	Turbidity	MULTIRAL		
	Time:		°C	mS/cm	mg/L	SU	mV	NTU	Other: <u>(/-) or</u>	Color / Odor / Comments	
	Method:		11.85	A.431	2.82	7.57	-152	17.4	ppr	CLEAR	1
			ta)	+ 0.1 41	+0.05 41	FIFI D PARA	METERS	1 1 7 3 1	6.0	CLEARER, NO ODOR	
	Time	Purge Vo	ol. Temp.	Cond.	DO	¥с.1 _{рН}	± [#] ORP	Turbidity	MULT; MAL Other: (%)	Color / Odor / Comments	
	1514	(gais)		mS/cm	mg/L	SU	mV	NTU	(ppm)		
	1036	1.65	11 70	0.07	6440	6 AL	0.4	84	e i		1-176
$\bigcirc$	1551	1.92	11.52	6.96	2 60	6.54	-140	16.4	d,d	COUNT, NO OVER, DF	Ft Ft
	1552	2.31	11.63	0.95	2.02	6.71	-147	27.2	0.6	11	-
	1557	2.67	12.02	6.94	2.15	6.81	-153	5.8	00	11	1
	1602	3.04	12.67	0.94	2.08	6.98	-156	3.4	A.0	11	
	1607	3.46	12.04	0.93	2.51	7.07	-154	8.6	<i>Û.G</i>	"	1
	1612	4.12	12.04	6.93	2.72	7.16	-152	25.7	G. H	11	1
	1617	4.58	11.93	0.93	2.72	7.23	-153	G.G	A.4	11	1
1633	162200	5.42	11.94	01432	5,90	7.55	-145	11.2	0.6	11	1
	1638	5.75	12-02	0.432	3.67	7.56	- 155	12.3	0.6	11	1
	Sample info	ormation: m	ethod, containe	r number, size	, and type, pre	eservative us	ed.				1
		,	Analysis		Prese	rvative	(	Container requiren	nents	No. of containers	]
		537	MOD		46"	C	1.2	5 ML HOPE 1	Poly	2	1
											1
											1
											]
	Observation	ns/Notes:	Q16:21 Dis	CHARGE TIM	+ > FILL TI	HADINA SCRI	EEN INTERI	ML: 182-1	92Ftbgs		
	HORIBA I	FLOW CELL	-,			50	P DEPTH	= 147 Ftbgs	ETTING = P	= A. 4657 × 187 +25	
	Pump Star	t Time: ) '	514		VOC Readin	19:6,6 PL	112 BEDS	Pressore S			
	Dumn Darr	the search					11-00 170		= 10	ce" locumic Time	= 200
$\bigcap$	Pump Dept	un: 187.	OFTDicc			F	NAL "ON" (E	SISCHARLES TIME	O ML/min	pre (Recharge) mere	
$\bigcirc$	Comple /7	may 1/5	5				WISCH ARL	E RATE - 21			
	Sample / 11	me: 165	J		Duplicate ID	E,	ND SAMPLE	TIME = 1700	, FINAL DTO	N = 126.91 Ftbruc	-
	Signature /-	NA II M	LPI		Duplicate ID	NO,: NIA					4
	joignature(s	1. / 10	at all	-							1



Client: Location Event: Date:				GITCOTIDI	AILA SAMP	LING DATA	SHEET		
Event:	•	NAVFAC		_ Proj	ject Number:			PAGE	2082
Date:				-	Sample ID:	WISCV	-MWG9M		
Dute.	6212	23/17		- San	npling Team:				
Weather	:			-				τ.	
Total De	pth:		FT.(BTOC)			Me	easuring Device:		
Depth to	water:	(-)	FT.(BTOC)				Date and Time:		
Water C	olumn:	(w)	FT.			W-11 D'-	N.I.		
Well Vol	ume:	<u>(x)</u>	GAL/FT.			(inches)	volume (gallons/foot)		
Total Pu	rge Vol.:		GAL.			1	0.041		
						1.25	0.064		
Purge D	evice:				-	2	0.163		
					13	4	0.653		
					SAMPLE	ATA			
Date:		Temp	Cond.	DO	рН	ORP	Turbidity	Other:	Color / Odor / Commeni
Time:		°C	mS/cm	mg/L	SU	mV	NTU		Color / Cool / Comment
Method:									
	Durge V		Oand		FIELD PARA	METERS	Turk faller	Mutint	
Time	(gals)	°C	mS/cm	mg/L	SU	mV	NTU	Other: (1.) 0-	Color / Odor / Comment
1643	6.13	11.9	6-431	3.64	7.58	-151	15.6	0-6	CLEAR, NO COUR, DT
1648	6.52	11.85	Ø.431	2.82	7.57	- 152	17.4	0.0	11
	All P.	ANAMETERS	STABLE	BISIDES	DO - 58	NSON STIL	L SETTLING	AFTER AIR	<u>.</u>
	DISCHA	mine o PR	DCEED TO SI	MPLE,	-				
	+								
Sample i	nformation: m	nethod, contai	ner number, size	, and type, pre	eservative use	ed.			
		Analysis		Prese	rvative	C	Container requirem	nents	No. of containers
							i		
							Y		
Ohaamia	iono/Nistaa								
Observa	IUNS/INDIES:								
Pump St	art Time:			VOC Readin	ıg:				
1.11									
Pump De	epth:								



					GROUNDW	ATER SAMP	LING DATA	SHEET				
	Client:		NAVFAC		Proj	Project Number: 679588. 89. FI. WI						
	Location:	OLF - COUP	EVILLE		_	Well ID:	WI-CV	- MWI35			-	
	Event:	GW SAMP	LING EN	this t 1	_	Sample ID:	WI-CV	-GW135-0	217		_	
	Date:	02/22/17	\$ 2/24	2017	San	pling Team:	M. END	O, B. PRENT	⁻ ICh		_	
	Weather:	MOSTLY SUNN	Y, LIGHT RA	HN, LOW SO'S	"F, wsw wi	ы D.S					_	
	Total Dep	th: i	14.0	FT.(BTOC)	6 4-6,	iph.	Me	easuring Device:	Service	(#25272) MUN =: DAG (		
	Depth to v	water: (-)	114.41	FT.(BTOC)	110.31° on .	2/24/2017		Date and Time:	02/22/17	AG:04	L102922	
	Water Col	umn:	3.59	FT.		1				07.01	-	
		(x)	0.163	GAL/FT.			Well Dia.	Volume	HORIBA	U-22 (CIUZ 387)		
	Well Volu	me:	0.59	GAL.			(inches)	(gallons/foot)				
	Total Purg	ge Vol.:	0.8	GAL.			1	0.041				
				-			1.25	0.064	1			
	Purge Dev	vice: Pr	ANACEA 26	· (# 8267	S) + Contra	ouen	2	0.163				
° O.	(1) (1)	HU	SKY AIR CO	mpnesson	(U8 5633 x	)	4	0.653				
PANN	cea 200 ("	82659) 170	WOA GENE	iantor (105	10322)				-			
Je 62/21/	1					SAMPLE [	DATA					
	Date: 01	1/24/17	Temp.	Cond.	DO	pН	ORP	Turbidity	Other:	Color / Odor / Comments	1	
	Time: 16	345	°C	mS/cm	mg/L	SU	mV	NTU				
	Method: i	Dirche Dry	NA -	Y NOT EN	What war	n H216117	IN WELL	TO SAMPLE	AND MAKE	WAP DATA [NO RECH.	AR62 ~	
					i i i i i i i i i i i i i i i i i i i	IELD PARAM	METERS				CAPACITY	
	Time	Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	Othory	Color / Odor / Commente		
		(gals)	°C	mS/cm	mg/L	SU	mV	NTU				
	0940	BEGIN F	UNGE.									
$\cap$	1050	WELL D	RY.		, , , , , , , , , , , , , , , , , , ,							
$\bigcirc$	1020	TUAN R	TURN TO	will ow	02/24/1	7. BEGIN	PUMPIN	G. DTW=1	10.31 F+ b	TOC.,		
	1035	MINIMAL	RECHARG	E, LOWER	en pump	TO WITH	IN IF+ B	ROM BOTTOM	AND SAM	PLED	1	
		were.	AGITATIO	DISCHARG	E DUE TO	LONS VOL	UMA IN	PUMD CHAME	BER .			
								77.5				
	Sample inf	ormation: metho	od container	number size	and type nre	servative use	d					
	Campio III	Ana	lvsis		Prese	vative		Container requiren	nents	No. of containers		
		537 M	00		4.6"	C	1-					
								LUME HOPE	101			
				2								
	Observatio	ns/Notes: Ge-	TTING DRAN	O LUDOU	30 milmin -	PROCEED	TO PUGE L	well Dry, w	ELL PURGED	0.24 @ 1050 -		
	DTW=1	11.4 FF5 TOC	TOP OF F	ump]. Coi	NTINUE PUR	ipinh to L	ower wate	Er LEVEL Equi	il to poinp	INTAKE - END @ 1103	P	
	Pump Star	rt Time: ⊖9:	40 00 07	1/24/17	VOC Readin	g: O.Oppr	n DUMO C	CONTROL DIESS	UNE SETTING			
	Dumo	16:	20 ON 02	124/17			= 77.	62ps;		0-4657 + 113 + 25		
$\bigcirc$	Pump Dep	II: 112.5	+broc on/	02/23/17, )	13.6 000 00	124/17.	FINAL "	ON" (DISCHARGE	) TIME = 40.	S "OFF" (RECHAPLES) TIM	HE= GASE	
$\bigcirc$	Comple /T	may 1At	MO INS	~			DISCHA	RHE RATE = NA		Contraction ( ) / /		
	Me/Men	No TO 4	5 105		Duplicate ID		END SI	AMPLE TIME	= 11:00 .	FINAL DEW=110-828	tsinc	
	Signaturo	NA N	1 c		Duplicate ID I	NU.: MA						
	Loignature(s	of. Elind	i rm									

1.00



					GROUNDW	ATER SAME	PLING DATA	SHEET				
$\sim$	Client:		NAVFAC		Pro	ject Number	: 07953	D.09.F	.No			
$\bigcirc$	Location:	OLF - CO	DEVILLE		Well ID: w1-04-GW115-02176							
	Event:	GIN SAMP	LING EVEN	71	Sample ID: WI-CV-MWIIS							
	Date:	02/24/17	,		Sampling Team: M. ENDO, B. PRENTIC							
	Weather: MOSTLY SUNNY, Low 40'S F. SE WINPS Q 46MPL										_	
	<b>T</b> D		1						<u>^</u>	,	-	
	Total Dep	oth:	140	_FT.(BTOC)			Me	asuring Device:	SOLOWIST	, MULTIRAE (CIO2"	922)	
	Depth to	water: (-	) 1/31,25	_FI.(BIOC)				Date and Time:	02/24/17 0	14:35	_	
	Water Co	lumn:	8.75	-			<b></b>		House u	22 ( ( 12702)		
		<u>()</u>	() Ø-163	GAL/FT.			Well Dia.	Volume				
	Well Volu	me:	1.43	GAL.			(incnes)	(gallons/foot)	4			
	Total Pure	ge Vol.:	1.34	_GAL.			1	0.041	-			
	_			14	<b>\</b>		1.25	0.064				
	Purge De	vice: $\frac{P_i}{r}$	ANACEA 200	9(* 82689	) + CONTROL	<u>.</u>	2	0.163		1.1.1		
			tonda Gente	NATOL			4	0.653		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		
	1									100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100		
		1-1/10-				SAMPLE	DATA					
	Date: L	126117	Temp.	Cond.	DO	pH	ORP	Turbidity	Other:	Color / Odor / Comments		
	Time: [6	150		ms/cm	mg/L	50	mv	NIU				
	Method:	low How	-					inter a comment				
						FIELD PARA	METERS					
	Time	Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	MULTIRAS Other: (1)	Color / Odor / Comments		
		(gals)	°C	mS/cm	mg/L	SU	mV	NTU	(p.1)	Color / Color / Colliments	1	
2/24	1600	BEGIN ?	unde o st	T @ "OFF	TIME =	HOSEC, "C	N'' = 75E	, O SOML/	n	/ / / / /	1	
$\bigcirc$	1713	0.58	10.13	0.416	9.77	6.08	\$ 184	2109	0.0	MOSTLY CLEAR, NO COO	Ditw=	
hil	1015	Segin	ulge	K400	ff'' = 50	L'ON =	9 Sec		5-2-3-5-		FASTO	
2/04	1015	JOONL	7:35	0.525	12.93	5.84	226	0.0	0.0	Clear Wulless.	ocarless	
	(030	0.5mL	8.0	0.404	11.67	7.04	216	0.0	0.0	4		
	1034	1.5 94	7.94	0.404	11.35	7.27	199	0,2	0.0	4		
	1040	1.7599	7.67	0.400	11.40	7.42	200	0.0	0.0	//		
	1220	well a	My tot	el Purg.	e 2.5	gal			and the second second	S		
	1425	begin	hyge a	Eggi A	For Sai	hPling		4		17		
	1430	2.00	7:21	0.435	13.67	7.79	133	3.3	r ( an an air a' a'			
	1420	Sampk	taice	n wt-	ev-GW	1115-07	17-		1	A MAC		
	Sample in	formation: meth	nod, container	number, size,	and type, pro	eservative use	ed.					
		An	alysis	<u>93</u>	Prese	rvative	Container requirements			No: of containers		
		537 M	100		26.0	C	12	SML HOPE	POLY			
					10 (Chi)			18				
								Jall .	here			
	<u> </u>										上選「ハ	
54	1										1.25	
- 1				North Street							10	
	Observatio											
	Observatio	ons/notes: Mr	FA DISCHAR		CONT	novods	C G ON	- JUSEL, ON	- 63 - 6 - 6			
	Dump Sto	rt Times	Mal DTW	24/17	=6tol	24	DOGS UNE	SETTING =	B.4657* 138	8+25		
	Pump Sta	rt nine: 16:	00 00 021	., ,	VUC Readin	19: 0.0 19p~	Pincoster	5	89.27ps:			
	Pump Der	oth: 176561	TAC									
$\bigcap$	. amp ber	15011	1000									
	Sample /T	ime: \\\\\\\	- Mari	ALC - A	212							
	MS/MSD VA											
	Signature/	s): Tr. J	12.00		Duplicate ID	1.1.1.1						
	-ignaturo(	. Jun										

1



Client: NAVFAC Project Number: $(a T T S S U, C T, F I, W, Y)$
Location: OLF CARRENING Well ID: WI-OV-MUNITM
Event: QVSGMERVUN   Sample ID: WI-CV-GhullM-0217
Date: 210/2017 Sampling Team: B. Prendice
Weather: MWay, Movers 43°F
Total Depth: $10.0$ FT.(BTOC) Measuring Device: $10.6$ G - 53
Depth to water: $(-)$ 131, g F1.(BTOC) Date and Time: $2/26/(7)$
water Column: <u>38.2</u> FI.
$\frac{(x) 0.163}{0.007}$ GAL/FT. Well Dia. Volume
Well Volume: (g. 227 GAL. (inches) (gallons/foot)
Total Purge Vol.: 3. 75 GAL. 1 0.041
1.25 0.064
Purge Device: <u>Pallacea</u> Besst Pump (2) 0.163
4 0.653
SAMPLE DATA
Date: 2/26/17 Temp. Cond. DO pH ORP Turbidity Other: Color / Odor / Comments
Time: [435 °C mS/cm mg/L SU mV NTU outon Color /
Method: LOVFIDW
FIELD PARAMETERS
Time Purge Vol. Temp. Cond. DO pH ORP Turbidity Other Other Other Other Comments
(gals) °C mS/cm mg/L SU mV NTU Uther: Color / Comments
1325 BEGIN PURC PUMP TOP @ 157.8FE SETCE OFFERDE ON = LOS PRESSURE SOPSI
1335 0.5 286 0.640 1.81 7.95 130 0.0 Clouds alay - Thirds le
1356 2 8.47 0.704 A.13 6.74 90 1.3 Junter Stratty alach alach
1405 7.3 8.19 0.676 3.71 7.57 65 18.3
1410 2.5 7.93 0.681 10.87 7.76 60 34.8 11
1420 3.0 8.03 0685 3.87 7.80 56 43.5 11
1430 3.2 7.99 0.692 3.94 7.82 61 41.0
1435 3.75 8.02 0.686 2.94 2.86 57 43.0
1435 Sample taken WE-CV-GWILM-DDIF
Sample information: method, container number, size, and type, preservative used.
Analysis Preservative Container requirements No. of containers
PFCS NOAEPA 537 NONE, KGC Z. 125mL POLYHOPE 2
Observations/Notes: Final DTV: 136 15 Ft NTOC
Pump Start Time: 1325 VOC Reading: 0.0 PPM
Pump Depth: 157.846b
Sample/Time: WF-CV-GWIIN-QLIT 1435
MS/MSD NA Duplicate ID No.: NA
Signature(s): T Cw / h
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2.1
$\cap$
-
$\bigcirc$
$\bigcirc$
$\bigcirc$
$\bigcirc$



				GROUNDW	ATER SAMP	LING DATA	SHEET			
Client:		NAVFAC		Pro	ect Number:	67958	0.09.FI	. WS		- 
Location:	OLFCOU	paville		-0	Well ID:	WI-CV-	MWØ3D			-
Event:	GW Sar	nple ev	ent 1	-	Sample ID:	WI-CV-	-GWØ3D	-0217		-
Date:	2/27/20	17	200-	San	npling Team:	B. Pres	ntice			-
Weather:	partly C	Iway,	39-1-	-0		C. Ma	IL			
Total Dept	h: 2	37	FT.(BTOC)			Me	asuring Device:	solinst	, MUHIRAR (C-1026	33)
Depth to w	vater: (-)	142.95	FT.(BTOC)				Date and Time:	2/27/20	9:30	
Water Colu	umn: 92	4.15	FT.							
	(x)	0.163	GAL/FT.			Well Dia.	Volume			
Well Volun	ne:	5.35	GAL.			(inches)	(gallons/foot)			
Total Purg	e Vol.: 3	75	GAL.			1	0.041	-		
_	. D	abara	100	Port	50	1.25	0.064	-		
Purge Dev		UN KU	tw con	+ CO NV	<u> </u>	2	0.163	-		
	F	inda	Gonard	the	4	4	0.053			
	P	inna	Clerence	aa	SAMPLE	ΔΤΔ				1
Date: 2	27/2017	Temp	Cond	00			Turbidity			
Time: 17	105	°C	mS/cm	mg/L	SU	mV	NTU.	Other:	Color / Odor / Comments	
Method:	OW POW									
method: [					FIELD PARA	METERS		SALE OF STREET		
	Purae Vol.	Temp.	Cond.	DO	рН	ORP	Turbidity			<u>(4</u> )
Time	(gals)	°C	mS/cm	mg/L	SU	mV	NTU	Other:	Color / Odor / Comments	l
16:10	.5	6.90	0.522	2.61	7.46	60	0.0		light gray clou	dy
110:15	1.5	6.21	0.530	3.43	7.44	12	0.0		N N	/
16:20	2:25	6.32	0.534	3.20	7.45	-12	0. O		#air whing pupp	rd off
16:50	2.5	6.44	0.537	2.22	7,33	-73	0.0		1	ł
1655	2.8	(0.72	0.524	2.60	7.36	-77	0.0		1	1
1100	3.2	6.81	0,531	2.55	7.38	- 80	0.0		1'	
FIUS	3.7)	(9.1) C (1)	0.537	2.15	7.39	- 18	0.0	12.21-	1	
* pw	angrou	STUR	inaun	Sarry	ple w	-CV-6	WØ3D-	021	1 1	
							1			
Sample info	ormation: metho	od. container	number, size.	and type, pr	I eservative use	ed.				
	Anal	lysis		Prese	rvative		Container requirer	ments	No. of containers	
PPCS	mod U	SEPA J	537	None	<6°C	125h	n Doly H	DPE	2	
				/			<u> </u>			
					11					
<u></u>				01.2	1 1		( ) ) .			
Observation	ns/Notes: h	ral pr	W: 143	.20	Honba	was	not call	viatin	givrbidity	
Dumm Cham	Time 1/1				acco	ntery				
rump star	11me: 15.4	+0		VUC Readin	19: 0,0,4	pm				
Pump Dept	th: 227).									
P			all7							
Sample /Ti	me: [N]-CV	-6W03D	-m:05	5	1.1					
MS/MSD	NA			Duplicate ID	NO .: NA					
Signature(s	1: NAP						6			
	1									5- 5-



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		SM		GROUNDW	ATER SAMP	LING DATA	SHEET					
Client:		NAVFAC		Pro	ject Number:	10795	KØ. 09. P	1.128		-0		
Location:	OLF 10.	peril	l	_	Well ID:	WI-CV	- MWOIN	1		-		
Event:	GW Sa	MpleE	vent 1	_	Sample ID:	WI-CV	-6W011	4-0227		-		
Date:	228201	1'	- 0,0-	San	npling Team:	B. Pher	ntile					
Weather: (	Novay	, snow	30×	-		M. Wi	mer			-		
Total Depth	n: [[]	03	FT.(BTOC)		Measuring Device: Solinst, Mutilave ((							
Depth to wa	ater: (-)	124.35	FT.(BTOC)	Date and Time: 2/28/2017 9:30								
Water Colu	mn: <u>38</u>	5.65	FT.									
	<u>(x)</u>	0.163	GAL/FT.			Well Dia.	Volume					
Well Volum	ie: <u>V</u>	.30	GAL.			(inches)	(gallons/foot)	-				
Total Purge	e Vol.:		_GAL.			1	0.041	-				
	D		ADD	+ Pan	M	1.25	0.064	-				
Purge Devi		WILL	the color	- Cont		(2)	0.163	-				
	t	in da	Gren a.	aby	V V	4	0.653					
HONAR GENERATON												
Date: 712	\$ 2017	Temp	Cond		DH	OBP	Turbidity					
Time: 1100	0	°C	mS/cm	mg/L	SU	mV	NTU	Other:	Color / Odor / Comments			
Method:1	SUSPINUS											
	1041000				FIELD PARA	METERS						
	Purge Vol.	Temp.	Cond.	DO	рН	ORP	Turbidity					
lime	(gals)	°C	mS/cm	mg/L	SU	mV	NTU	Other:	Color / Odor / Comments			
10:25	2	8.08	D.575	2.39	10.49	144	0.0		clear no odor	ŕ		
10:30	25	845	0.567	2.34	7.02	51	0.0		1			
10:25	3	8.99	0.562	3.02	7.50	14	0.0					
10:40	3.5	9.07	0.560	3.42	7.62	10	0.0					
10:45	4	9.11	0.560	2.89	7.67	12	0.0					
10:30	4.5	9.19	0.339	2.76	7.72	13	0.0					
10.33	0	9.15	0.550	2.85	7.73	10	0.0	2.4.00	4			
# HULL	man	o Hur	yuua	, sarry	pre w	-0-6	1001-0	211				
Sample info	rmation: metho	od. container	number, size	, and type, pr	eservative use	ed.						
	Ana	lysis		Prese	rvative	0	Container requirer	nents	No. of containers			
PPCS 1	und use	PA-53	7	lone.	26°C	1254	n Doly H	DP4	2			
				1			• 0					
								1				
Observation	ns/Notes: Fiv	ral D	TW = 12	4.4'			÷					
Pump Start Time: 9.45 VOC Reading: D. O pump												
During Durity 1 (2)												
Pump Deptl	h: 155											
Sample /Tin	ne: WI-C	V-6W	Ø14-9	1217 (	Q 11.0	D						
MS/MSD	MA			Duplicate ID	NO .: NA					l		
Signature(s)	BA				t					]		

		SM		GROUNDW	ATER SAMP	LING DATA	SHEET					
Client:		NAVFAC		Proj	ect Number:	r: 679580.09. FI.WS						
Location:	OLF Car	aville,	WA	-	Well ID:	QUI-CV	-MWØ1	D				
Event:	GW Jan	iple t	vent 1		Sample ID:	whar.	-GWOID	-0217				
Weather	DULLU	CIADALA	AT°E	San 2	npling leam:	D. HUNDORO						
-	puang	1	+ 10 1			<u>M.</u> W14	meet	Calical	14 1120 10 -			
Total Depth	$\frac{2}{2}$		FT.(BTOC)		Measuring Device: <u>Solinst</u> , Mutricane (C-1							
Water Colu	ater: $(-)$	141.00	FI.(BIOC)			Date and Time: $2/28/2017 - 9.30$						
Water Colu	(x)	D.1103	GAL/FT.			Well Dia	Volume	1				
Well Volum	e: $\frac{1}{\sqrt{2}}$	2.29	GAL.			(inches)	(gallons/foot)					
Total Purge	Vol.:	4	GAL.			1	0.041					
			0.0		2	1.25	0.064					
Purge Devi	ce: <u>P(</u>	enacer	1 100 +	- Contro	1	(2)	0.163					
	1	USKY A	ir Comp	Nessor		4	0.653					
	1	ovale (	renera	HV .	CAMDLE							
Date: 2/2	x17017	Temp	Cond	00			Turbidity					
Time: 140	20	°C	mS/cm	mg/L	SU	mV	NTU	Other:	Color / Odor / Comments			
Method:	ON CLOW											
					FIELD PARA	METERS						
Timo	Purge Vol.	Temp.	Cond.	DO	рН	ORP	Turbidity	Other	Color / Odor / Commonto			
Time	(gals)	°C	mS/cm	mg/L	SU	mV	NTU	Other:	Color / Odor / Comments			
1305	Or S	8.77	0.342	6.54	8.02	92	0.0		Clear, no odor			
1310	1	8.71	0.373	4.56	7.95	38	0.0					
1536	1.5	9.53	0.372	2.52	7.96	2	0.0		* UST plessore	~		
1240	2.5	9.51	12 372	2.18	1.95	-44	0.0		alle hs vaur	1		
1345	3	9.57	0.375	1.95	7.95	-105	0,0			*		
1350	3.5	9.49	0.375	2.06	7.95	-61	0.0					
1355	4	9.44	0,375	2.02	7.93	-67	0.0					
* para	meters	stab	ilized	procee	atos	ample	WFCV-	6W01D-	0217			
1				*		,						
Sampla info	rmation: mathe	ad container	number eize	and type pr								
Sample into	Anal	lvsis	iuniber, 5126,	Prese	rvative	εu. Ι (	Container requirer	nents	No. of containers			
PPC.V	NOA 125	(PA-53	7	NONe. «	<lo°c.< td=""><td>125 r</td><td>n Poly</td><td>HDPC</td><td>2</td><td></td></lo°c.<>	125 r	n Poly	HDPC	2			
Vac 1	1000 000			100 1					51			
					а. Шар							
-								· · · · · · · · · · · · · · · · · · ·				
Observation	s/Notes:	nal DI	W = 14	1.8'								
Pump Start Time: 12:30 VOC Reading: (). Dipinite												
Pump Depth: 207)												
Sample /Tin	ne: WI-CI	1-GW,0.	LD-02:	17@	1400							
MS/MSD	NK	-		Duplicate ID	NO .: NIA	K						
Signature(s)	Nove	-										



Ch	21	A.								
		SM		GROUNDW	ATER SAMP	LING DATA	SHEET			R.
Client:		NAVFAC		Proi	ect Number:	107951	D.09.F	1.WS		8.
Location:	() F (C	Unavill	OINA		Well ID:	WI-CV-	MUDZ	5		-
Event:	GW Sa	mple 1-	-vent 1	( (	Sample ID:	WI-CV.	-GW025	- 0217		_
Date:	312017			San	npling Team:	B. PH	notice			-
Weather:	Cloudy	Irany,	400							-
- Total Danth		15				Ma	acuring Device	CINCI	AA DE Day 10	G-1020
Depth to w	$\frac{1}{(-)}$	0120	FT (BTOC)			IVIE	Date and Time	DOLIVIT,	MUM Rae (1=	1014
Water Colu	mn: (*)	210	FT				Date and Time	- 3/1/201	830	-
Water Oolu	(x)	0.103	GAL/FT.			Well Dia	Volume	٦		
Well Volum	e: $\frac{(x)}{2}$	05	GAL.			(inches)	(gallons/foot)			
Total Purge	Vol.: 2	5	GAL.			1	0.041	-		
						1.25	0.064	-		
Purge Devi	ce: F	anale	12 20	OtCor	trai	(2)	0.163	7		
	-	HUSKY	AVA	mores	for	4	0.653			
	4	ionda	Genera	ator	er rik	•	•	-		
	,				SAMPLE	DATA				
Date: 3 1	12017	Temp.	Cond.	DO	pН	ORP	Turbidity	Other	Color / Odor / Commente	
Time: 🎢 : ð	D	°C	mS/cm	mg/L	SU	mV	NTU	Ourier	Color / Odor / Comments	, ,
Method: ]	ow Flow									
				1	FIELD PARA	METERS				
Timo	Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	Othor	Color / Odor / Commonto	]
Time	(gals)	°C	mS/cm	mg/L	SU	mV	NTU		Color / Odor / Comments	,
1015		7.78	0.669	9.79	6.69	239	0.0		clear, nood	00
1020		7.82	0.668	2.97	6.97	232	0.0		1	
1025		7.87	0.668	2.99	7.19	219	0.0			_
1030		7.94	0.665	2.93	7.27	209	0.0			_
1035		8.00	0.667	2,94	7.31	193	0.0			_
1040		8.03	667	2.91	7.34	187	0,0			4
10x5		5-11	0.666	2.81	7.36	171	0.0		<u> </u>	-
1050		8.10	0-1066	2.83	7.57	170	0.0		ļ	-
1053	6 640 1 2 4	8.18	0.601	2.80	7.58	100	O.O is		1BI.C ROL-	-
p para	implas	STabil	120a, p	rocen	10 Jam	al tet	evenes	WI-01-61	1000-0117	-
Sample info	rmation: moth	od container	number size	and type pro	acorvativo uco	l				
Sample mo		lveis	number, size,	Proso	rvativo	su.	Container require	monte	No. of containers	4
DEAS	lend COA	-(37)		A)ma a	< 1.00	12000	1 only	ID DK		-
TICS I	VIULI EPA	1 3 3 7		NOVO,		10511	11 P019 11	DIC	L	-
					1				<u>+</u>	1
										1
										1
									1	1
										1
Observation	s/Notes: Fi	may D	TW = 92	.73'					-	1
Pump Start	Time: 092	10		VOC Readin	19: 0.0p	pm				
Pump Dept	h: 100)									
Sample /Tir	ne: WI-C	V-GWG	025-02	170	11:00		1			
MS/MSD J	VIA			Duplicate ID	No.: WI-	N-GW	025/SP-D1	317		1
Signatu re(s)	12m									1



 $\bigcirc$ 

			GROUNDW	ATER SAMP	LING DATA	SHEET				1
Client:	NAVFAC		Pro	ect Number:	67958	10,09.71.0	S			_
Location: OLF C	appelille	WA	-	Well ID:	WI-CV	-MWOZN	1			_
Event: <u>GWS</u>	ample E	went 1	_	Sample ID:	WI-OV-	GW 02M	-0317			_
Date: 3/1201-	7	_	San	npling Team:	B. Pren	tile				<u></u>
Weather: <u>CWAY</u>	,40°F		-0							
Total Depth:	107.5	FT.(BTOC)			M	easuring Device:	Salinch	- MULK	DARLO	1171.
Depth to water:	1123.8	FT.(BTOC)				Date and Time:	3/1/2	1.7 830	icher (1-)	0006
Water Column:	13.7	FT.					Still			-
	(x) 0.163	GAL/FT.			Well Dia.	Volume	1			
Well Volume:	7.12	GAL.			(inches)	(gallons/foot)				
Total Purge Vol.:	3	GAL.			1	0.041	1			
_					1.25	0.064	1			
Purge Device:	Panale	a 200	+ cont	(0)	(2)	0.163	1			
-	HUSKY -	ANY Com	passo	r	4	0.653	]			
	Hunda	- Gen	erator							
				SAMPLE	DATA					
Date: 31/2017	Temp.	Cond.	DO	pН	ORP	Turbidity	Other:	Color / Odd	or / Commente	
Time: 1355	°C	mS/cm	mg/L	SU	mV	NTU				
Method: LOW Flow	S									
				FIELD PARA	METERS	and the second second				
Time Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	Othor	Color / Odd		
(gals)	°C	mS/cm	mg/L	SU	mV	NTU	Other		J / Comments	
1310 2	9.42	0.587	3.61	9.67	209	0.0		cleury	no odi	or
B15 .8	9.507	0.588	2.41	7.68	132	0.0				
1320 1,1	9.54	0.589	212	7.68	87	0.0				
1325 1.4	9-58	0.590	1.96	7.68	53	0.0				
330 1.7	9.59	6,594	1.84	1.69	59	0.0				
1335 2.0	9.08	0.097	1.76	1.09	8	00				
1340 2.3	9.66	0.098	1.17	1.69	=11	0.0				
IZED DO	9:05	0,597	1.10	1.69	- 15	0.0			/	
1000 5.0	1.04	0.347	$\left  \right\rangle$	1.09	-10	0.0	61176/2	1721-7	*	
* purprete	UN STAN	rura	proce	ca jos	partipu	wi-wi-	BW62-	1001		
Sample information: me	thad container	number size	and type pr	l econvativo uco	l		/			ł
	nalvsis	number, size,	Prese	rvative	οu. Ι (	Container requirer	ments	No. of (	containers	
DOCS MOD (	APA-53-	<u>ר</u>	Non	<6F	1.7.5	M PAN 1	INPC	7	Jontainero	1
1105 1000 4 2			,,		40	<u></u>	1010			
					-					1
										1
Observations/Notes:	mar DT	WEIT	23.8							
*										
Pump Start Time: 12	:45		VOC Readir	ng: 0.0k	pm					
	- 1			1						
Pump Depth: 157.	5									
• • • • • • • • • • • • • • • • • • •	M. GU	5K7 M-1	7217 (	0 120	5					
Sample /Time: WI-	. LV - 14	-w-r-j	USVI (	~ 153						
MS/MSD NK			Duplicate ID	NO.: NA	Y					ļ
Signature(s): < K/S										J

				GROUNDW	ATER SAMP	LING DATA	SHEET				
Client:	al F An in	NAVFAC		Project Number: 679580,09-P1-WS							
Location:	orrap	willin	UA	Semple ID: (1) (1) (1) (1) (1) (1)							
Event:	6W Jam	ple fre	nt1		Sample ID:	W1-6V-0	20085-02	\$17			
Date:	3/2/2017	at m	-	Sam	pling Team:	B. Pren	the				
Weather:	rainy, 3	9°F		-							
Total Dept	h: (2	35	FT.(BTOC)		Measuring Device: Solunst, Wiltilar (1-103						
Depth to w	vater: (-)	117.8	FT.(BTOC)				Date and Time:	2/2/201-	7 820		
Water Col	umn: $\frac{1}{1}$	1.2	FT.		Succure mile. Sterwort 080						
	(x)	0.163	GAL/FT.			Well Dia.	Volume	1			
Well Volur	ne: 2	.80	GAL.			(inches)	(gallons/foot)				
<b>Total Purg</b>	e Vol.:	3	GAL.			1	0.041	1			
			_			1.25	0.064	1			
Purge Device: Danacla 200 +				control		(2)	0.163	1			
	Ħ	USKY A	r comb	nessor		4	0.653				
	H	ondo E	renenia	tu							
	,				SAMPLE	DATA					
Date: 3/2/	2017	Temp.	Cond.	DO	pН	ORP	Turbidity	Other	Calar / Odar / Commonto		
Time: 10	50	°C	mS/cm	mg/L	SU	mV	NTU	Other.			
Method /	no Row										
						UETEDO					
	Durge Val	Tomp	Cond			ODD	Turbidity				
Time	Fulge Vol.	remp.	Cond.	00	ρ <del>Π</del>	URP	Turbidity	Other:	Color / Odor / Comments		
1000	(gais)	GIG	mS/cm	mg/L	SU	mv	NIU		Avanal stand by		
1000	05	8.18	0.50	1.50	1.80	065	0.0		Orwige Crovay, nov		
1005	03	8.40	0.501-	6.11	6.14	293	0.0		4		
1010	- 13	8.10	0.500	6.01	6.95	212	0.0				
1015	125	9.00	0.501	6.13	7.01	270	0.0				
1020	1.05	6.20	0.511	6.12	7.15	1610	0.0				
1003	1.75	0.3/	0.318	618	1.25	181	0.0				
1020	2.	G 21	0.SIF	600	725	1-0	0.0				
1020	2.25	8.2	DISIS	610	7.21	170	0.0				
1040	250	6.31	0.014	10.11	7.21	191	0.0				
+ DAA	motion	- Chip	lized	DVDCCC	to ca	maloll	JLAV-GUD	ORG-03	77		
Sample info	ormation: metho	od container	number size	and type pre	eservative use	ed and	Free que	000000	41		
Campio III	Ana	lysis	110111001; 0120;	Prese	rvative	(	Container requirer	nents	No. of containers		
PPPS	MOD FR	1-137		1m.	<10°C	125	middly	1DPC	2		
110.1	June of I			100 41					~		
		2									
Observatio	ns/Notes: PI	UAL DI	70=117	fr'							
Pump Star	t Time: 930			VOC Readin	19:00 m	pm					
					PI						
Pump Dep	th: 12.51										
Sample /Ti	ime: <u>WI-CV</u>	-6W08	5-0317	@ 10:	50				× 0,		
MS/MSD	NK			Duplicate ID	No .: MA		-				
Signature(s	s): MAN										



(Page 1 of 2)

			GROUNDW	ATER SAMP	LING DATA	SHEET	0			
Client:	NAVFAC		Proj	Project Number: 04580.04.141.WS						
Location: OLY COV	pannell	UA	13	Well ID:	MW-0	84				
Event: <u>Could</u>	mpleti	ent +	•	Sample ID:	WI-0-0	3W08M-0	8317			
Date: 314 1001	(M)°		Sam	ipling leam:	B. prera	nce				
weather: <u>Cloudy</u>	40		0	,	Marine and Anna and A					
Total Depth:	165	FT.(BTOC)			Me	easuring Device:	Solinst	MULTIRE	2010-1021	
Depth to water:	(-) 122.8	FT.(BTOC)				Date and Time:	3/4/2017	9:05		
Water Column:	42.2	FT.								
	(x) 0.163	GAL/FT.			Well Dia.	Volume				
Well Volume:	10.88	GAL.			(inches)	(gallons/foot)				
Total Purge Vol.:	3.5	_GAL.			1	0.041				
	Denacaa	2001.00	ub (1)		1.25	0.064				
Purge Device:	ranacea	au fu	nivol		(2)	0.163				
e	HUSKY A	r comp	essor		4	0.653	l			
Honak Generativ										
D 1 1/1000				SAMPLE D	ATA			a barren berezen		
Date: 3/4/10/1	Temp.	Cond.	DO	рН	ORP	lurbidity	Other:	Color / Odor /	Comments	
Time: VOS	C	mS/cm	mg/L	SU	mV	NTU				
Method: Low Plor	N									
				IELD PARAM	METERS					
Purge Vo	I. Temp.	Cond.	DO	рН	ORP	Turbidity				
l ime (gals)	°C	mS/cm	ma/L	SU	mV	NTU	Other:	Color / Odor /	Comments	
1058 .25	7.07	0.580	9.11	7.23	204	0.0		DALBALI	1 audy no	
1103 .50	7.37	0.578	7.22	7.52	185	0.0		- Children Children	j oder	
1108 .75	7.71	0.573	10.24	7.62	170	0.0				
1113 ]	7.94	0.570	519	7.70	154	0.0				
1118 1.25	8.11	0.567	4.77	7.75	140	0.0				
1123 1.50	8.13	0.563	4.12	7.79	123	0.0				
1128 1.75	8.13	0.563	3.72	7.82	1150	0.0				
1133 2	8.25	0.560	3.34	7.84	109	0.0				
1138 2.25	8.61	0.559	3.08	7.86	111	0.0				
1143 2.50	8.95	0.560	3.03	7.88	103	0.0			/	
1148 2.75	9.12	0.538	2.62	7.88	84	0.0		Y		
Sample information: me	ethod, container	number, size,	and type, pre	eservative use	ed.					
FOR Made of	Analysis		Prese	rvative	(	Container requirer	nents	No. of col	itainers	
PPUS MODE	14-531		NUML, C	600	TUSM	I POLY MD	PE	2		
Observations/Notes:	INAL DI	15-1727	RADI							
	NOTE DI	120.2	0100							
Pump Start Time: 9.	30 am		VOC Readin	a. D.On	m					
			roo nouum	9.0.000	~~~~					
Pump Depth: 1551	BTDC									
Sample /Time: WI-	W-Gwo	8M-03.	17@12	200						
MS/MSD NA			Duplicate ID	NO .: NA						
Signature(s):	-		anna da marintenette a com							

C	12/	M.
		SM SM

(Page 2082) GROUNDWATER SAMPLING DATA SHEET

Client: Location: Event: Date: Weather:	01F Com GW San 3/4/201 (10/4y 4	NAVFAC Deville u upu eve	)4 n+ 1	Proj	ect Number: Well ID: Sample ID: ppling Team:	679550 MW-08 WI-CV-6 B.Pren	M 3008M-03 2008M-03	ช 1า	
Total Dep Depth to v Water Col	th: // water: (-) lumn:	65 122.8 42.2	FT.(BTOC) FT.(BTOC) FT.			Me	easuring Device: Date and Time:	306/105+ 3/4/2017	9:05 9:05
Well Volu Total Purç	me: (x) ge Vol.: 3	6.163 .88 3.5	GAL/FT. GAL. GAL.		Well Dia. Volume (inches) (gallons/foot) 1 0.041				
Purge Dev	vice: P	anaceo Iusky f Junda E	tr con	contro pressor	14	2 4	0.004 0.163 0.653	-	n
					SAMPLE	DATA			
Date: 34	1001	Temp. °C	Cond. mS/cm	DO ma/l	pH SU	ORP mV	Turbidity NTU	Other:	Color / Odor / Comments
Method: [	LOW AOW	Ű	morom	mg/ E					
				-	IELD PARA	METERS			
Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other:	_ Color / Odor / Comments
1153	3.0	9.05	0.557	2.69	7.89	78	0.0		Orange Cladyno
* Par	ametus	Stalp'	lined p	YOULED		ample	W1-0V-(	5wØ8 -	0317
Sample inf	formation: metho Ana	od, container lysis	number, size,	and type, pre	eservative use rvative	ed.	Container requirer	nents	No. of containers
Observatio	ons/Notes: PNN rt Time: 9:30 oth: 155' P3 Time: WI-CV-	AL PTU D TOL -	2=123.2 Ø8M-Ø3	BTDC VOC Readin	1200, No: 114	pm			
Signature(	s):12/2				10 1- 1/1				

A.S.

				GROUNDW	ATER SAMP	LING DATA	SHEET				
Client:		NAVFAC		Proj	ect Number:	674380.	09. F1. WS				
Location:	out cara	anly u	A	Well ID: MW-14M							
Event:	6W San	1 ple ever	41		Sample ID:	WI-CV-	GWI4M-Q	317			
Date:	314/2017	1		Sam	pling Team:	.B. Prent	the				
Weather:	ODVAL 4	5°F		1		M. WH	ma				
Total Dent	h J	710	ET (BTOC)		Massuring Davice: Salin & Mut						
Depth to w	(ator: (-)	177 81	FT (BTOC)			ivit	Date and Time:	24/25	17 9:05		
Water Colu	Imp: <u>(-)</u>	165.54	FT.(DIOC)				Date and Time.	314/00	1/ 1.03		
Water oon	$\frac{3}{(\mathbf{x})}$	M1102	GAL/FT			Well Dia	Volume	1			
Well Volun	ne: <u>(///</u>	- PP	GAL			(inches)	(gallons/foot)				
Total Purg		7.5	GAL.			1	0.041	-			
rotarrang			O/IL.			1 25	0.064				
Purge Dev	ice D	naron	21m +	Contra		(2)	0.004				
i uige bev	<u>100.</u>	USKU AN	(Mailar	LANC .	•	4	0.653				
	Fi	mad Gi	nevator	1880.			0.000				
	11	CU			SAMPLE	DATA					
Date: 3/4	12017	Temp.	Cond.	DO	pH	ORP	Turbidity	01			
Time: 150	50	°C	mS/cm	ma/L	SU	mV	NTU	Other:	Color / Odor / Comments		
Method:	Die TAMI										
wethou.	DD FIDD			-							
	D. Mal	<b>-</b>		h FO	IELD PARA	METERS					
Time	Purge Vol.	Temp.	Cond.	DO	рН	ORP	lurbidity	Other:	Color / Odor / Comments		
11 3.00	(gals)	°C	mS/cm	mg/L	SU	mV	NTU				
140.2	.2	8.35	0.581	3.03	-1.68	01	0.0		allar, ho odar		
1001	.4	8.48	0.593	2.00	7.03	-11	0.0				
1003	top 1	8.69	0.540	1.85	7.01	-51	0.0				
1008	4251	8.60	0.600	1.61	7.58	-57	0.0				
14 LL	1.25	3.57	0.001	1.58	1.56	-14	0.0				
1041	1.5	801	0.001	1.30	7.55	-82	0.0				
1454	1, 15	8.41	0,000	1.4)	(1)	= 93	0.0				
1639	2.0	0.57 C 20	0.590	1.29	7.55	-100	0.0		The second		
1077	2.1	0.30	0.518	1.34	7.00	-102	0.0		A OF Pressure		
11050	6.63	8.23	0.549	1.31	1.50	= 100	0.0		Cillar no bar		
Sample info	ormation: metho	nd container	number size	and type pre	servative use	hed	0.0		-		
ouripio inte	Anal	vsis	110111001, 0120,	Prese	rvative	() (	Container requirer	nents	No. of containers		
DECSN	100 600-	(37		DSIM	POLL HOA	e Nine	CLOF	nonto			
100 10	cont en i	307		12.0000		5					
					10	No					
					1 (c=1 - 1						
Observation	ns/Notes: 67	LOU DI	U=122.	5'BTOC	- mitic	a dept	n takin be	fore Voi	une boosta		
	4.1		0					Was	dropped.		
Pump Star	t Time: 153	Ð		VOC Readin	g: 0.0pp	n			• •		
	2								8		
Pump Dep	th: ~144'	BTDC					4				
				A 1-	6						
Sample /Ti	me: WI-CV	1-GW141	4-10317	@ 17	00						
MS/MSD	NA			Duplicate ID	No .: NA	-					
Signature(s	1: 120				1-						
	1 UT										

Attachment 5 Groundwater Elevation Study Hydrographs




















































Attachment 6 Raw Data Tables

Sample ID	WI-CV-GW01D-0217	WI-CV-GW01M-0217	WI-CV-GW02M-0317	WI-CV-GW02S-0317	WI-CV-GW02SP-0317	WI-CV-GW03D-0217	WI-CV-GW03M-0217	WI-CV-GW04M-0217	WI-CV-GW04S-0317	WI-CV-GW04SP-0317
Sample Date	2/28/17	2/28/17	3/1/17	3/1/17	3/1/17	2/27/17	2/27/17	2/28/17	3/1/17	3/1/17
Chemical Name										
Semivolatile Organic Compounds (NG/L)										
Perfluorobutanesulfonic acid (PFBS)	4 U	3.94 U	3.88 U	332	357	3.91 U	3.88 U	4.03 U	3.91 U	3.82 U
Perfluorooctane Sulfonate (PFOS)	0.9 U	0.886 U	0.872 U	54.7	53	0.914 J	0.872 U	0.907 U	0.879 U	0.859 U
Perfluorooctanoic acid (PFOA)	2 U	1.97 U	1.94 U	571	564	1.95 U	1.94 U	2.02 U	1.95 U	1.91 U
2:Wsers/ijamison/Desktop/CTO 08 PFC/Coupeville Groundwater TMattachments/Att6_Raw Data Tables/(OLF Coupeville_SI_GW_PFAS_val_table_032417.xlsx), Tiffany Hill, 03/24/2017										

Notes: J - Analyte present. Value may or may not be

accurate or precise

NG/L - Nanograms per liter NS - Not sampled

U - The material was analyzed for, but not detected

Sample ID	WI-CV-GW05M-0217	WI-CV-GW05S-0217	WI-CV-GW06M-0217	WI-CV-GW06S-0217	WI-CV-GW06SP-0217	WI-CV-GW07M-0317	WI-CV-GW07S-0317	WI-CV-GW08M-0317	WI-CV-GW08S-0317
Sample Date	2/23/17	2/24/17	2/21/17	2/22/17	2/22/17	3/4/17	3/4/17	3/4/17	3/2/17
Chemical Name									
Semivolatile Organic Compounds (NG/L)									
Perfluorobutanesulfonic acid (PFBS)	473	12.9	3.91 U	3.97 U	3.94 U	3.91 U	4.39 U	3.91 U	3.85 U
Perfluorooctane Sulfonate (PFOS)	3.26 J	0.922 U	0.879 U	0.893 U	0.886 U	0.844 J	0.987 U	0.879 U	0.865 U
Perfluorooctanoic acid (PFOA)	1,190	9.87	1.95 U	1.98 U	1.97 U	1.95 U	2.19 U	1.95 U	1.92 U
2:Users)ijamison/Desktop/CTO 08 PFC/Coupeville Groundwater TM/attachm									

Notes: J - Analyte present. Value may or may not be

accurate or precise

NG/L - Nanograms per liter

NS - Not sampled

U - The material was analyzed for, but not detected

Sample ID	WI-CV-GW09M-0217	WI-CV-GW10D-0217	WI-CV-GW10M-0217	WI-CV-GW11M-0217	WI-CV-GW11S-0217	WI-CV-GW12D-0317	WI-CV-GW13M-0217	WI-CV-GW13S-0317	WI-CV-GW14M-0317
Sample Date	2/23/17	2/20/17	2/22/17	2/26/17	2/26/17	3/1/17	2/22/17	3/3/17	3/4/17
Chemical Name									
Semivolatile Organic Compounds (NG/L)									
Perfluorobutanesulfonic acid (PFBS)	11.2	3.85 U	3.07 J	7.66 U	3.91 U	3.97 U	139	4.07 U	111
Perfluorooctane Sulfonate (PFOS)	0.915 U	0.865 U	0.938 U	1.72 U	1 U	0.893 U	0.872 U	0.915 U	0.898 J
Perfluorooctanoic acid (PFOA)	2.03 U	1.92 U	2.08 U	3.83 U	1.95 U	1.98 U	20.4	2.03 U	166
2:Users)ijamison/Desktop/CTO 08 PFC/Coupeville Groundwater TMattachn									

Notes: J - Analyte present. Value may or may not be

accurate or precise NG/L - Nanograms per liter

NS - Not sampled

U - The material was analyzed for, but not detected

Sample ID	WI-CV-GW01D-0217	WI-CV-GW01M-0217	WI-CV-GW02M-0317	WI-CV-GW02S-0317	WI-CV-GW02SP-0317	WI-CV-GW03D-0217	WI-CV-GW03M-0217	WI-CV-GW04M-0217	WI-CV-GW04S-0317	WI-CV-GW04SP-0317
Sample Date	2/28/17	2/28/17	3/1/17	3/1/17	3/1/17	2/27/17	2/27/17	2/28/17	3/1/17	3/1/17
Chemical Name										
Semivolatile Organic Compounds (NG/L)										
Perfluorobutanesulfonic acid (PFBS)	4 U	3.94 U	3.88 U	332	357	3.91 U	3.88 U	4.03 U	3.91 U	3.82 U
Perfluorooctane Sulfonate (PFOS)	0.9 U	0.886 U	0.872 U	54.7	53	0.914 J	0.872 U	0.907 U	0.879 U	0.859 U
Perfluorooctanoic acid (PFOA)	2 U	1.97 U	1.94 U	571	564	1.95 U	1.94 U	2.02 U	1.95 U	1.91 U

C:\Users\jjamison\Desktop\CTO 08 PFC\Coupeville Groundwater TMattachments\Att6_Raw Data Tables\(OLF Coupeville_SI_GW_PFAS_val_table_032417.xlsx), Tiffany Hill, 03/24/2017

Notes: J - Analyte present. Value may or may not be accurate or precise

NG/L - Nanograms per liter

NS - Not sampled

U - The material was analyzed for, but not detected

Shading indicates detection

Sample ID	WI-CV-GW05M-0217	WI-CV-GW05S-0217	WI-CV-GW06M-0217	WI-CV-GW06S-0217	WI-CV-GW06SP-0217	WI-CV-GW07M-0317	WI-CV-GW07S-0317	WI-CV-GW08M-0317
Sample Date	2/23/17	2/24/17	2/21/17	2/22/17	2/22/17	3/4/17	3/4/17	3/4/17
Chemical Name								
Semivolatile Organic Compounds (NG/L)								
Perfluorobutanesulfonic acid (PFBS)	473	12.9	3.91 U	3.97 U	3.94 U	3.91 U	4.39 U	3.91 U
Perfluorooctane Sulfonate (PFOS)	3.26 J	0.922 U	0.879 U	0.893 U	0.886 U	0.844 J	0.987 U	0.879 U
Perfluorooctanoic acid (PFOA)	1,190	9.87	1.95 U	1.98 U	1.97 U	1.95 U	2.19 U	1.95 U
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Notes: J - Analyte present. Value may or may not be accurate or precise NG/L - Nanograms per liter NS - Not sampled U - The material was analyzed for, but not detected Shading indicates detection

Sample ID	WI-CV-GW08S-0317	WI-CV-GW09M-0217	WI-CV-GW10D-0217	WI-CV-GW10M-0217	WI-CV-GW11M-0217	WI-CV-GW11S-0217	WI-CV-GW12D-0317	WI-CV-GW13M-0217	WI-CV-GW13S-0317	WI-CV-GW14M-0317
Sample Date	3/2/17	2/23/17	2/20/17	2/22/17	2/26/17	2/26/17	3/1/17	2/22/17	3/3/17	3/4/17
Chemical Name										
Semivolatile Organic Compounds (NG/L)										
Perfluorobutanesulfonic acid (PFBS)	3.85 U	11.2	3.85 U	3.07 J	7.66 U	3.91 U	3.97 U	139	4.07 U	111
Perfluorooctane Sulfonate (PFOS)	0.865 U	0.915 U	0.865 U	0.938 U	1.72 U	1 U	0.893 U	0.872 U	0.915 U	0.898 J
Perfluorooctanoic acid (PFOA)	1.92 U	2.03 U	1.92 U	2.08 U	3.83 U	1.95 U	1.98 U	20.4	2.03 U	166
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Notes: J - Analyte present. Value may or may not be accurate or precise

NG/L - Nanograms per liter

NS - Not sampled

U - The material was analyzed for, but not detected

Shading indicates detection

Sample ID Sample Date	USEPA Lifetime Health Advisory (May 2016)	USEPA Tapwater RSLs, HQ = 1.0 (May 2016)	WI-CV-GW01D-0217 2/28/17	WI-CV-GW01M-0217 2/28/17	WI-CV-GW02M-0317 3/1/17	WI-CV-GW02S-0317 3/1/17	WI-CV-GW02SP-0317 3/1/17	WI-CV-GW03D-0217 2/27/17	WI-CV-GW03M-0217 2/27/17
Chemical Name	· · · · · · · · · · · · · · · · · · ·	,							
Semivolatile Organic Compounds (NG/L)									
Perfluorobutanesulfonic acid (PFBS)		380,000	4 U	3.94 U	3.88 U	332	357	3.91 U	3.88 U
Perfluorooctane Sulfonate (PFOS)	70		0.9 U	0.886 U	0.872 U	54.7	53	0.914 J	0.872 U
Perfluorooctanoic acid (PFOA)	70		2 U	1.97 U	1.94 U	571	564	1.95 U	1.94 U

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Notes:

J - Analyte present. Value may or may not be accurate or precise NG/L - Nanograms per liter

NS - Not sampled

U - The material was analyzed for, but not detected

-- - No screening criteria available

Shading indicates detection Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSLs, HQ = 1.0 (May 2016)

Sample ID Sample Date	USEPA Lifetime Health Advisory (May 2016)	USEPA Tapwater RSLs, HQ = 1.0 (May 2016)	WI-CV-GW04M-0217 2/28/17	WI-CV-GW04S-0317 3/1/17	WI-CV-GW04SP-0317 3/1/17	WI-CV-GW05M-0217 2/23/17	WI-CV-GW05S-0217 2/24/17	WI-CV-GW06M-0217 2/21/17	WI-CV-GW06S-0217 2/22/17
Chemical Name									
Semivolatile Organic Compounds (NG/L)									
Perfluorobutanesulfonic acid (PFBS)		380,000	4.03 U	3.91 U	3.82 U	473	12.9	3.91 U	3.97 U
Perfluorooctane Sulfonate (PFOS)	70		0.907 U	0.879 U	0.859 U	3.26 J	0.922 U	0.879 U	0.893 U
Perfluorooctanoic acid (PFOA)	70		2.02 U	1.95 U	1.91 U	1,190	9.87	1.95 U	1.98 U

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Notes:

J - Analyte present. Value may or may not be accurate or precise

NG/L - Nanograms per liter

NS - Not sampled

U - The material was analyzed for, but not detected

-- - No screening criteria available

Shading indicates detection Bolded text indicated exceedance of USEPA Lifetime Health Advisory

Underlined text indicated exceedance of USEPA Tapwater RSLs, HQ = 1.0 (May 2016)

Sample ID Sample Date	USEPA Lifetime Health Advisory (May 2016)	USEPA Tapwater RSLs, HQ = 1.0 (May 2016)	WI-CV-GW06SP-0217 2/22/17	WI-CV-GW07M-0317 3/4/17	WI-CV-GW07S-0317 3/4/17	WI-CV-GW08M-0317 3/4/17	WI-CV-GW08S-0317 3/2/17	WI-CV-GW09M-0217 2/23/17	WI-CV-GW10D-0217 2/20/17
Chemical Name									
Semivolatile Organic Compounds (NG/L)									
Perfluorobutanesulfonic acid (PFBS)		380,000	3.94 U	3.91 U	4.39 U	3.91 U	3.85 U	11.2	3.85 U
Perfluorooctane Sulfonate (PFOS)	70		0.886 U	0.844 J	0.987 U	0.879 U	0.865 U	0.915 U	0.865 U
Perfluorooctanoic acid (PFOA)	70		1.97 U	1.95 U	2.19 U	1.95 U	1.92 U	2.03 U	1.92 U

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Notes:

J - Analyte present. Value may or may not be accurate or precise

NG/L - Nanograms per liter

NS - Not sampled

U - The material was analyzed for, but not detected

-- - No screening criteria available

Shading indicates detection Bolded text indicated exceedance of USEPA Lifetime Health Advisory

<u>Underlined text indicated exceedance of USEPA</u> <u>Tapwater RSLs, HQ = 1.0 (May 2016)</u>

Sample ID Sample Date	USEPA Lifetime Health Advisory (May 2016)	USEPA Tapwater RSLs, HQ = 1.0 (May 2016)	WI-CV-GW10M-0217 2/22/17	WI-CV-GW11M-0217 2/26/17	WI-CV-GW11S-0217 2/26/17	WI-CV-GW12D-0317 3/1/17	WI-CV-GW13M-0217 2/22/17	WI-CV-GW13S-0317 3/3/17	WI-CV-GW14M-0317 3/4/17
Chemical Name									
Semivolatile Organic Compounds (NG/L)									
Perfluorobutanesulfonic acid (PFBS)		380,000	3.07 J	7.66 U	3.91 U	3.97 U	139	4.07 U	111
Perfluorooctane Sulfonate (PFOS)	70		0.938 U	1.72 U	1 U	0.893 U	0.872 U	0.915 U	0.898 J
Perfluorooctanoic acid (PFOA)	70		2.08 U	3.83 U	1.95 U	1.98 U	20.4	2.03 U	166

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Notes:

J - Analyte present. Value may or may not be accurate or precise NG/L - Nanograms per liter

NS - Not sampled

U - The material was analyzed for, but not detected

-- - No screening criteria available

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory Underlined text indicated exceedance of USEPA Tapwater RSLs, HQ = 1.0 (May 2016)

Attachment 7 Data Validation Report



#### DATA VALIDATION SUMMARY REPORT COUPEVILLE, WASHINGTON

Client:	CH2M HILL, Inc., Corvallis, Oregon
SDG:	1700261
Laboratory:	Vista Analytical Laboratory, El Dorado Hills, California
Site:	Coupeville, CTO-0008, Washington
Date:	March 24, 2017

		PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-CV-GW10D-0217	1700261-01	Water
2	WI-CV-EB01-022017	1700261-02	Water
3	WI-CV-GW06S-0217	1700261-03	Water
4	WI-CV-GW06SP-0217	1700261-04	Water
5	WI-CV-GW10M-0217	1700261-05	Water
6	WI-CV-EB03-022217	1700261-06	Water
7	WI-CV-GW06M-0217	1700261-07	Water
7MS	WI-CV-GW06M-0217MS	1700261-07MS	Water
7MSD	WI-CV-GW06M-0217MSD	1700261-07MSD	Water
8	WI-CV-EB02-022117	1700261-08	Water
9	WI-CV-EB04-022317	1700261-09	Water
10	WI-CV-GW13M-0217	1700261-10	Water

A full data validation was performed on the analytical data for six water samples and four aqueous equipment blank samples collected on February 20-23, 2017 by CH2M HILL at the Coupeville site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

Analysis	Method References
PFCs	USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM), Version 5.0 (July 2013) and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," August 2014;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

## Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate recovery (%R)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Ongoing Precision and Recovery (OPR)
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

## Data Usability Assessment

There were no rejections of data.

Overall the data is acceptable for the intended purposes. There were no qualifications.

# Perfluorinated Compounds (PFCs)

# Data Completeness, Case Narrative & Custody Documentation

• The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

# Holding Times

• All samples were extracted within 14 days for water samples and analyzed within 28 days.

## Initial Calibration

• All percent difference (%D) and/or correlation coefficients criteria were met.

# Continuing Calibration

• All percent difference (%D) and RRF criteria were met.

## Method Blank

• The method blanks were free of contamination.

## Field QC Blank

• The field blank samples exhibited the following contamination.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-CV-EB01-022017	None - ND	1. Con		
WI-CV-EB03-022217	None - ND	35	(H)	
WI-CV-EB02-022117	None - ND	5. <del>0</del> 5	(#)	
WI-CV-EB04-022317	Perfluorobutanesulfonate	2.99	None	All associated ND
	Perfluorooctanoic Acid	2.55	None	All associated ND
WI-CV-FB01-030217	None - ND		1922	4
(SDG 1700293)				

## Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

## Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

• The MS/MSD sample exhibited acceptable %R and RPD values.

## Ongoing Precision and Recovery (OPR)

• The OPR samples exhibited acceptable percent recoveries (%R) values.

## **Target Compound Identification**

• All mass spectra and quantitation criteria were met.

## Compound Quantitation

• All criteria were met.

## Field Duplicate Sample Precision

• Field duplicate results are summarized below.

Compound	WI-CV-GW06S-0217 ng/L	WI-CV-GW06SP-0217 ng/L	RPD	Qualifier
None	ND	ND	1.00	5

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

<u>Manypleaver</u> Nancy Weaver

Dated: 3/24/17

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID:	WI-CV-GW10D-0217								Modifie	d EPA Met	thod 537
Client Data			Sample Data			Laborat	ory Data				
Name:	CH2M Hill		Matrix:	Groundwater		Lab Sa	mple: 170026	1-01 Dat	te Received:	24-Feb-2017	7:32
Project:	NavyClean OLF Coupeville		Sample Size:	0.130 L		QC Ba	tch: B7B01	18 Dat	te Extracted:	24-Feb-2017	10:58
Date Collected: Location:	20-Feb-2017 11:45 WI-CV-MW10D					Date A	nalyzed: 01-Mar	-17 18:30 Column: BI	EH C18		
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifi	iers	Labeled Stan	lard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.72	3.85	7.67		IS	13C3-PFBS		88.5	60 - 150	
PFOA	ND	0.624	1.92	7.67		IS	13C2-PFOA		97.0	60-150	
PFOS	ND	0.773	0.865	7.67		IS	13C8-PFOS		93.5	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID:	WI-CV-EB01-022017								Modifie	d EPA Me	thod 537
Client Data			Sample Data			Laborat	ory Data				
Name:	CH2M Hill		Matrix:	Groundwater		Lab Sa	mple:	1700261-02	Date Received:	24-Feb-2017	7 7:32
Project:	NavyClean OLF Coupeville		Sample Size:	0.118 L		QC Ba	ch:	B7B0118	Date Extracted:	24-Feb-2017	7 10:58
Date Collected:	20-Feb-2017 12:00					Date A	nalyzed:	01-Mar-17 18:43 Colu	mn: BEH C18		
Location:	Equipment Blank										
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Quali	fiers	Labe	eled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.89	4.24	8.46		IS	13C3	3-PFBS	107	60 - 150	
PFOA	ND	0.689	2.12	8.46		IS	13C2	2-PFOA	95.4	60-150	
PFOS	ND	0.854	0.953	8.46		IS	13C8	3-PFOS	107	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID:	WI-CV-GW06S-0217								Modifie	d EPA Me	thod 537
Client Data			Sample Data			Labor	atory D	ata			
Name:	CH2M Hill		Matrix:	Groundwater		Lab S	Sample:	1700261-03	Date Received:	24-Feb-2017	7:32
Project:	NavyClean OLF Coupeville		Sample Size:	0.1 <b>26 L</b>		QC E	Batch:	B7B0118	Date Extracted:	24-Feb-2017	10:58
Date Collected:	22-Feb-2017 12:05					Date	Analyz	ed: 01-Mar-17 18:55 Colu:	mn: BEH C18		
Location:	WI-CV-MW06S		1								
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qual	ifiers	I	abeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.77	3.97	7.93			IS 1	3C3-PFBS	114	60 - 150	
PFOA	ND	0.645	1.98	7.93			IS 1	3C2-PFOA	102	60 - 150	
PFOS	ND	0.800	0.893	7.93			IS 1	3C8-PFOS	99.0	60-150	

DL - Detection limit RL - Reporting limit LCL-UCL - Lower control limit - upper control limit Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID:	WI-CV-GW06SP-0217								Modifie	d EPA Me	thod 537
Client Data			Sample Data			Labo	ratory	Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab	Samp	le: 1700261-04	Date Received:	24-Feb-2017	7:32
Project:	NavyClean OLF Coupeville		Sample Size:	0.1 <b>27</b> L		QC	Batch	: B7B0118	Date Extracted:	24-Feb-2017	10:58
Date Collected:	22-Feb-2017 11:05					Date	Anal	yzed: 01-Mar-17 19:08 Colu	mn: BEH C18		
Location:	WI-CV-MW06S Spike										
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qual	ifiers		Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.77	3.94	7.90			IS	13C3-PFBS	102	60 - 150	
PFOA	ND	0.643	1.97	7.90			IS	13C2-PFOA	106	60 - 150	
PFOS	ND	0.797	0.886	7.90			IS	13C8-PFOS	104	60-150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID:	WI-CV-GW10M-0217							Modifie	d EPA Me	thod 537
Client Data			Sample Data			Laborat	ory Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Sa	mple: 1700261-05	Date Received:	24-Feb-2017	7:32
Project:	NavyClean OLF Coupeville		Sample Size:	0.120 L		QC Bat	tch: B7B0118	Date Extracted:	24-Feb-2017	10:58
Date Collected:	22-Feb-2017 10:00					Date Ar	nalyzed: 01-Mar-17 19:20 Colu	mn: BEH C18		
Location:	WI-CV-MW10S									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualif	iers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	3.07	1.87	4.17	8.35	J	IS	13C3-PFBS	95.9	60-150	
PFOA	ND	0.679	2.08	8.35		IS	13C2-PFOA	90.3	60 - 150	
PFOS	ND	0.842	0.938	8.35		IS	13C8-PFOS	100	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers Only the linear isomer is reported for all other analytes.

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Sample ID:	WI-CV-EB03-022217							Modifie	ed EPA Me	thod 537
Client Data			Sample Data			Laborato	ory Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Sar	nple: 1700261-06	Date Received:	24-Feb-2017	7 7:32
Project:	NavyClean OLF Coupeville		Sample Size:	0.119 L		QC Bat	ch: B7B0118	Date Extracted:	24-Feb-2017	7 10:58
Date Collected:	22-Feb-2017 11:15					Date Ar	alyzed: 01-Mar-17 19:33 Co	olumn: BEH C18		
Location:	Equipment Blank									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualif	iers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.88	4.20	8.38		IS	13C3-PFBS	110	60 - 150	
PFOA	ND	0.682	2.10	8.38		IS	13C2-PFOA	105	60 - 150	
PFOS	ND	0.845	0.945	8.38		IS	13C8-PFOS	97.3	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID:	WI-CV-GW06M-0217							Modifie	d EPA Met	thod 537
Client Data			Sample Data			Laborato	ry Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab San	nple: 1700261-07	Date Received:	24-Feb-2017	7:32
Project:	NavyClean OLF Coupeville		Sample Size:	0.128 L		QC Bate	bh: B7B0118	Date Extracted:	24-Feb-2017	10:58
Date Collected	21-Feb-2017 14:25					Date An	alyzed: 01-Mar-17 19:45 Col	umn: BEH C18		
Location:	WI-CV-MW06M									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualif	iers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.75	3.91	7.81		IS	13C3-PFBS	107	60 - 150	
PFOA	ND	0.635	1.95	7.81		IS	13C2-PFOA	106	60-150	
PFOS	ND	0.787	0.879	7.81		IS	13C8-PFOS	110	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers Only the linear isomer is reported for all other analytes.



Sample ID:	WI-CV-EB02-022117							Modifie	d EPA Me	thod 537
Client Data			Sample Data		La	aboratory	Data			
Name:	CH2M Hill		Matrix:	Groundwater	1	Lab Samp	le: 1700261-08	Date Received:	24-Feb-2017	7:32
Project:	NavyClean OLF Coupeville		Sample Size:	0.124 L		QC Batch	: B7B0118	Date Extracted:	24-Feb-2017	10:58
Date Collected: Location:	21-Feb-2017 16:10 Equipment Blank				I	Date Anal	yzed: 01-Mar-17 20:23 Colu	mn: BEH C18		
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifier	s	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.81	4.03	8.07		IS	13C3-PFBS	91.5	60-150	
PFOA	ND	0.657	2.02	8.07		IS	13C2-PFOA	96.8	60-150	
PFOS	ND	0.815	0.907	8.07		IS	13C8-PFOS	95.4	60-150	

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DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID:	WI-CV-EB04-022317							Modifie	d EPA Me	thod 537
Client Data			Sample Data		I	Laborator	y Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Sam	ple: 1700261-09	Date Received:	24-Feb-2017	7:32
Project:	NavyClean OLF Coupeville		Sample Size:	0.122 L		QC Batc	h: B7B0118	Date Extracted:	24-Feb-2017	10:58
Date Collected:	23-Feb-2017 12:05					Date Ana	alyzed: 01-Mar-17 21:51 Colu	ımn: BEH C18		
Location:	Equipment Blank									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifie	ers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	2.99	1.84	4.10	8.23	J	IS	13C3-PFBS	86.5	60 - 150	
PFOA	2.55	0.670	2.05	8.23	J	IS	13C2-PFOA	107	60 - 150	
PFOS	ND	0.830	0.922	8.23		IS	13C8-PFOS	105	60-150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.



Sample ID:	WI-CV-GW13M-0217								Modifie	d EPA Met	thod 537
Client Data			Sample Data			Laborat	ory Data				
Name:	CH2M Hill		Matrix:	Groundwater		Lab Sa	mple:	1700261-10	Date Received:	24-Feb-2017	7:32
Project:	NavyClean OLF Coupeville		Sample Size:	0.129 L		QC Ba	tch:	B7B0118	Date Extracted:	24-Feb-2017	10:58
Date Collected:	22-Feb-2017 16:25					Date A	nalyzed:	01-Mar-17 22:03 Colum	n: BEH C18		
Location:	WI-CV-MW13M										
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Quali	fiers	Lab	eled Standard	%R	LCL-UCL	Qualifiers
PFBS	139	1.74	3.88	7.78		IS	1303	3-PFBS	92.2	60 - 150	
PFOA	20.4	0.633	1.94	7.78		15	13C	2-PFOA	117	60 - 150	
PFOS	ND	0.785	0.872	7.78		IS	13C	3-PFOS	106	60-150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers,

Only the linear isomer is reported for all other analytes



#### DATA VALIDATION SUMMARY REPORT COUPEVILLE, WASHINGTON

Client:	CH2M HILL, Inc., Corvallis, Oregon
SDG:	1700268
Laboratory:	Vista Analytical Laboratory, El Dorado Hills, California
Site:	Coupeville, CTO-0008, Washington
Date:	March 24, 2017

PFCs								
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix					
1	WI-CV-GW09M-0217	1700268-01	Water					
2	WI-CV-GW05M-0217	1700268-02	Water					
3	WI-CV-GW05S-0217	1700268-03	Water					
4	WI-CV-GW11M-0217	1700268-04	Water					
5	WI-CV-GW11S-0217	1700268-05	Water					
6	WI-CV-EB06-022617	1700268-06	Water					
7	WI-CV-EB05-022417	1700268-07	Water					

A full data validation was performed on the analytical data for five water samples and two aqueous equipment blank samples collected on February 23-26, 2017 by CH2M HILL at the Coupeville site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

<u>Analysis</u>	Method References
PFCs	USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM), Version 5.0 (July 2013) and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," August 2014;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

## Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate recovery (%R)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Ongoing Precision and Recovery (OPR)
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

## Data Usability Assessment

There were no rejections of data.

Overall the data is acceptable for the intended purposes as qualified for the data quality indicator criteria as detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedences of QC criteria.

# Perfluorinated Compounds (PFCs)

## Data Completeness, Case Narrative & Custody Documentation

• The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

## Holding Times

• All samples were extracted within 14 days for water samples and analyzed within 28 days.

# **Initial Calibration**

• All percent difference (%D) and/or correlation coefficients criteria were met.

# Continuing Calibration

• All percent difference (%D) and RRF criteria were met.

# Method Blank

• The method blanks were free of contamination.

## Field QC Blank

• The field blank samples were free of contamination except for the following.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-CV-EB06-022617	Perfluorooctanesulfonate	1.12	U	5
WI-CV-EB05-022417	None - ND	121	Ξ.	-
WI-CV-FB01-031217	None - ND	-	8	
(SDG 1700293)				

## Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

# Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

• A MS/MSD sample was not collected.

# Ongoing Precision and Recovery (OPR)

• The OPR samples exhibited acceptable percent recoveries (%R) values.

## **Target Compound Identification**

• All mass spectra and quantitation criteria were met.

# Compound Quantitation

• Several samples were analyzed at various dilutions due to high concentrations of target compounds. The reporting limits were adjusted accordingly. No action was required.

## Field Duplicate Sample Precision

• Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Dated:

Nancy Weaver Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID:	WI-CV-GW09M-0217							Modifie	d EPA Me	thod 537
Client Data			Sample Data		1	Laborator	y Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Sam	ple: 1700268-01	Date Received:	28-Feb-2017	7:28
Project:	Navy Clean CTO-0008 OLF Cou	peville	Sample Size:	0.123 L		QC Batc	h: B7C0003	Date Extracted	01-Mar-2017	7 8:54
Date Collected:	23-Feb-2017 16:55					Date Ana	alyzed: 06-Mar-17 17:30 Colu	mn: BEH C18		
Location:	MW09M									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifi	ers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	11.2	1.82	4.07	8.12		IS	13C3-PFBS	95.8	60-150	
PFOA	ND	0.661	2.03	8.12		IS	13C2-PFOA	86.1	60 - 150	
PFOS	ND	0.819	0.915	8.12		IS	13C8-PFOS	93.9	60-150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL;

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

NW 3/24/17

1
Sample ID:	WI-CV-GW05M-0217							Modifie	d EPA Me	ethod 537
Client Data			Sample Data			Laborato	ry Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab San	nple: 1700268-02	Date Received:	28-Feb-201	7 7:28
Project:	Navy Clean CTO-0008 OLF Coup	eville	Sample Size:	0.0655 L		QC Bate	ch: B7C0012	Date Extracted:	01-Mar-201	7 8:54
Date Collected:	23-Feb-2017 15:45					Date An	alyzed: 05-Mar-17 16:07 Colu	ımn: BEH C18		
Location:	MW05M									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifi	ers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	473	3.42	7.63	15.3		IS	13C3-PFBS	103	60 - 150	
PFOA	1190	1.24	3.82	15.3		IS	13C2-PFOA	84.9	60-150	
PFOS	3.26	1.54	1.72	15.3	J	IS	13C8-PFOS	98.7	60-150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers

Only the linear isomer is reported for all other analytes

Sample ID:	WI-CV-GW05S-0217							Modifie	d EPA Me	thod 537
Client Data Name: Project: Date Collected:	CH2M Hill Navy Clean CTO-0008 OLF Coup 24-Feb-2017 17:30 MW05S	eville	Sample Data Matrix: Sample Size:	Groundwater 0.122 L		Laborator Lab Samp QC Batch Date Ana	y <b>Data</b> ple: 1700268-03 h: B7C0003 lyzed: 06-Mar-17 17:43 Co	Date Received: Date Extracted: lumn: BEH C18	28-Feb-2017 01-Mar-2017	7:28 7 8:54
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifi	iers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	12.9	1.83	4.10	8.17		IS	13C3-PFBS	75.3	60-150	
PFOA	9.87	0.665	2.05	8.17		IS	13C2-PFOA	75.9	60 - 150	
PFOS	ND	0.824	0.922	8.17		IS	13C8-PFOS	78.8	60-150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

Sample ID:	WI-CV-GW11M-0217							Modifie	d EPA Me	thod 537
Client Data			Sample Data			Laborator	ry Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Sam	ple: 1700268-04	Date Received:	28-Feb-2017	7:28
Project:	Navy Clean CTO-0008 OLF Coup	eville	Sample Size:	0.0653 L		QC Batc	h: B7C0012	Date Extracted:	01-Mar-2017	8:54
Date Collected:	26-Feb-2017 14:35					Date Ana	alyzed: 05-Mar-17 16:20 Colu	umn: BEH C18		
Location:	MWIIM									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Quali	liers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	3.43	7.66	15.3		IS	13C3-PFBS	90.6	60 - 150	
PFOA	ND	1.25	3.83	15.3		IS	13C2-PFOA	87.4	60 - 150	
PFOS	ND	1.55	1.72	15.3		IS	13C8-PFOS	86.1	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

Sample ID:	WI-CV-GW11S-0217							Modifie	d EPA M	ethod 537
Client Data Name: Project: Date Collected: Location:	CH2M Hill Navy Clean CTO-0008 OLF Cour 26-Feb-2017 16:30 MW11S	peville	Sample Data Matrix: Sample Size:	Groundwater 0.128 L		aborator Lab Sam QC Batcl Date Ana	y Data ple: 1700268-05 h: B7C0003 lyzed: 06-Mar-17 17:55	Date Received: Date Extracted: Column: BEH C18	28-Feb-201 01-Mar-203	7 7:28 17 8:54
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifier	"S	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.75	3.91	7.83		IS	13C3-PFBS	79.6	60-150	
PFOA	ND	0.637	1.95	7.83		IS	13C2-PFOA	93.0	60 - 150	
PFOS	1.00 🗸	0.790	0.879	7.83	1	IS	13C8-PFOS	89.8	60 - 150	
		DL - De	etection limit			LCL-UC	L - Lower control limit - upper c	ontrol limit		

RL - Reporting limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers,

Only the linear isomer is reported for all other analytes



Sample ID:	WI-CV-EB06-022617							Modifie	d EPA Me	ethod 537
Client Data			Sample Data		I	aborator	y Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Sam	ple: 1700268-07	Date Received:	28-Feb-201	7 7:28
Project:	Navy Clean CTO-0008 OLF Coup	peville	Sample Size:	0.106 L		QC Batcl	n: B7C0003	Date Extracted:	01-Mar-201	7 8:54
Date Collected: Location:	26-Feb-2017 17:45 Eq. Blank		-			Date Ana	lyzed: 06-Mar-17 18:08 Col	umn: BEH C18		
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifie	ers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	2.10	4.72	9.40		IS	13C3-PFBS	86.8	60-150	
PFOA	ND	0.765	2.36	9.40		IS	13C2-PFOA	84.2	60-150	
PFOS	1.12	0.948	1.06	9.40	J	IS	13C8-PFOS	91.9	60-150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.



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										7
Sample ID:	WI-CV-EB05-022417							Modifie	d EPA Me	thod 537
Client Data			Sample Data		La	aborator	y Data			
Name:	CH2M Hill		Matrix:	Groundwater	I	Lab Sam	ple: 1700268-08	Date Received:	28-Feb-2017	7:28
Project:	Navy Clean CTO-0008 OLF Couj	peville	Sample Size:	0.1 <b>27</b> L		QC Batcl	n: B7C0003	Date Extracted:	01-Mar-2017	8:54
Date Collected:	24-Feb-2017 11:35				I	Date Ana	lyzed: 06-Mar-17 18:20 0	Column: BEH C18		
Location:	Eq. Blank									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifier	s	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.77	3.94	7.90		IS	13C3-PFBS	97.9	60-150	
PFOA	ND	0.643	1.97	7.90		IS	13C2-PFOA	88.7	60 - 150	
PFOS	ND	0.797	0.886	7.90		IS	13C8-PFOS	99.8	60-150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL:

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes

NW3124/17



#### DATA VALIDATION SUMMARY REPORT COUPEVILLE, WASHINGTON

Client:	CH2M HILL, Inc., Corvallis, Oregon
SDG:	1700280
Laboratory:	Vista Analytical Laboratory, El Dorado Hills, California
Site:	Coupeville, CTO-0008, Washington
Date:	March 24, 2017

	F	PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-CV-GW03M-0217	1700280-01	Water
2	WI-CV-GW03D-0217	1700280-02	Water
3	WI-CV-EB07-022717	1700280-03	Water
4	WI-CV-GW04M-0217	1700280-04	Water
5	WI-CV-GW01M-0217	1700280-05	Water
6	WI-CV-EB08-022817	1700280-06	Water
7	WI-CV-GW01D-0217	1700280-07	Water

A full data validation was performed on the analytical data for five water samples and two aqueous equipment blank samples collected on February 27-28, 2017 by CH2M HILL at the Coupeville site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

<u>Analysis</u>	Method References
PFCs	USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM), Version 5.0 (July 2013) and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," August 2014;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

## Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate recovery (%R)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Ongoing Precision and Recovery (OPR)
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

## Data Usability Assessment

There were no rejections of data.

Overall the data is acceptable for the intended purposes. There were no qualifications.

## Perfluorinated Compounds (PFCs)

## Data Completeness, Case Narrative & Custody Documentation

• The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

## Holding Times

• All samples were extracted within 14 days for water samples and analyzed within 28 days.

## Initial Calibration

• All percent difference (%D) and/or correlation coefficients criteria were met.

# Continuing Calibration

• All percent difference (%D) and RRF criteria were met.

## Method Blank

• The method blanks were free of contamination.

## Field QC Blank

• The field blank samples were free of contamination except for the following.

Blank ID	Compound	Conc.	Qualifier	Affected Samples
		ng/L		
WI-CV-EB07-022717	None - ND			5
WI-CV-EB08-022817	Perfluorooctanesulfonate	1.16		None - All Associated ND
WI-CV-FB01-031217	None - ND	3 <del>4</del> 3	-	
(SDG 1700293)				

#### Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

## Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

• A MS/MSD sample was not collected.

## Ongoing Precision and Recovery (OPR)

• The OPR samples exhibited acceptable percent recoveries (%R) values.

## Target Compound Identification

• All mass spectra and quantitation criteria were met.

## **Compound Quantitation**

• All criteria were met.

## Field Duplicate Sample Precision

• Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver Dated: 3/24/17

Senior Chemist

Environmental Data Services, Inc. March 24, 2017

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID:	WI-CV-GW03M-0217								Modifie	d EPA Me	thod 537
Client Data			Sample Data			Labor	atory I	Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab	Sample	: 1700280-01	Date Received:	02-Mar-2017	10:14
Project:	Navy Clean CTO 8 OLF Coupeville		Sample Size:	0.1 <b>29</b> L		QC I	Batch:	B7C0012	Date Extracted:	03-Mar-2017	8:25
Date Collected:	27-Feb-2017 13:15					Date	Analy	zed: 05-Mar-17 16:32 Colu	ımn: BEH C18		
Location:	MW03M										
Алајуtе	Conc. (ng/L)	DL	LOD	LOQ	Quali	fiers		Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.74	3.88	7.76			IS	13C3-PFBS	92.1	60 - 150	
PFOA	ND	0.631	1.94	7.76			IS	13C2-PFOA	85.2	60 - 150	
PFOS	ND	0.782	0.872	7.76			IS	13C8-PFOS	95.0	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

Sample ID:	WI-CV-GW03D-0217							Modifie	d EPA M	ethod 537
Client Data			Sample Data		L	aboratory	/ Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Samp	lc: 1700280-02	Date Received:	02-Mar-20	17 10:14
Project:	Navy Clean CTO 8 OLF Coupevill	e	Sample Size:	0.128 L		QC Batch	: B7C0012	Date Extracted:	03-Mar-20	17 8:25
Date Collected: Location:	27-Feb-2017 17:05 MW03D					Date Anal	yzed: 05-Mar-17 16:45 Colu	ımn: BEH C18		
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifie	ers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.75	3.91	7.81		IS	13C3-PFBS	86.7	60-150	
PFOA	ND	0.635	1.95	7.81		IS	13C2-PFOA	83.5	60-150	
PFOS	0.914	0.788	0.879	7.81	J	IS	13C8-PFOS	101	60-150	
		DL - D	etection limit			LCL-UCI	L - Lower control limit - upper control li	imit		

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

Sample ID:	WI-CV-EB07-022717							Modifie	ed EPA M	ethod 537
Client Data			Sample Data		L	aborator	/ Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Samp	le: 1700280-03	Date Received:	02-Mar-201	7 10:14
Project:	Navy Clean CTO 8 OLF Coupevil	e	Sample Size:	0.115 L		QC Batch	: B7C0012	Date Extracted:	03-Mar-201	7 8:25
Date Collected:	27-Feb-2017 17:10				1	Date Anal	yzed: 05-Mar-17 16:57 Col	umn: BEH C18		
Location:	Eq. Blank									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifier	rs	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.95	4.35	8.69		IS	13C3-PFBS	88.9	60-150	
PFOA	ND	0.708	2.17	8.69		IS	13C2-PFOA	86,3	60-150	
PFOS	ND	0.877	0.978	8.69		IS	13C8-PFOS	88.0	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

Sample ID:	WI-CV-GW04M-0217							Modifie	ed EPA M	ethod 537
Client Data			Sample Data		L	aboratory	/ Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Samp	le: 1700280-04	Date Received:	02-Mar-20	17 10:14
Project:	Navy Clean CTO 8 OLF Coupeville	,	Sample Size:	0.124 L		QC Batch	: B7C0012	Date Extracted:	03-Mar-20	17 8:25
Date Collected	28-Feb-2017 10:00					Date Anal	yzed: 05-Mar-17 17:10 Colu	ımn: BEH C18		
Location:	MW04M									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifie	ers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.80	4.03	8.06		IS	13C3-PFBS	92.3	60 - 150	
PFOA	ND	0.656	2.02	8.06		IS	13C2-PFOA	95.1	60 - 150	
PFOS	ND	0.813	0.907	8.06		IS	13C8-PFOS	107	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID:	WI-CV-GW01M-0217							Modifie	ed EPA Mo	ethod 537
Client Data			Sample Data			Laborator	ry Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Sam	ple: 1700280-05	Date Received:	02-Mar-201	7 10:14
Project:	Navy Clean CTO 8 OLF Coupevill	e	Sample Size:	0.1 <b>27</b> L		QC Batc	h: B7C0012	Date Extracted:	03-Mar-201	7 8:25
Date Collected:	28-Feb-2017 11:00					Date Ana	alyzed: 05-Mar-17 17:22 Colu	umn: BEH C18		
Location:	MW01M									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Quali	fiers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.76	3.94	7.88		IS	13C3-PFBS	90.0	60 - 150	
PFOA	ND	0.641	1.97	7.88		IS	13C2-PFOA	93.2	60 - 150	
PFOS	ND	0.795	0.886	7.88		IS	13C8-PFOS	110	60-150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes

NW 3/24/17

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Y	

Sample ID:	WI-CV-EB08-022817							Modifie	d EPA Me	thod 537
Client Data			Sample Data		L	aborator	y Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Sam	ple: 1700280-06	Date Received:	0 <b>2-M</b> ar-2017	10:14
Project:	Navy Clean CTO 8 OLF Coupeville	e	Sample Size:	0.110 L		QC Batcl	1: B7C0012	Date Extracted:	03-Mar-2017	8:25
Date Collected:	28-Feb-2017 12:30					Date Ana	lyzed: 05-Mar-17 17:35 Colu	ımn: BEH C18		
Location:	Eq. Blank									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifie	rs	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	2.04	4.55	9.12		IS	13C3-PFBS	103	60 - 150	
PFOA	ND	0.742	2.27	9.12		IS	13C2-PFOA	93.8	60 - 150	
PFOS	1.16	0.920	1.02	9.12	J	IS	13C8-PFOS	85.8	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Mu 3/24/17

Sample ID:	WI-CV-GW01D-0217							Modifie	ed EPA Me	thod 537
Client Data Name: Project: Date Collected:	CH2M Hill Navy Clean CTO 8 OLF Coupevill 28-Feb-2017 14:00	e	Sample Data Matrix: Sample Size:	Groundwater 0.125 L		Laborate Lab Sa QC Ba Date A	<b>bry Data</b> mple: 1700280-07 ch: B7C0012 nalyzed: 05-Mar-17 17:47 C	Date Received: Date Extracted: olumn: BEH C18	02-Mar-201 03-Mar-201	7 10:14 7 8:25
Location: Analyte	MW01D Conc. (ng/L)	DL	LOD	LOQ	Qualif	iers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS PFOA PFOS	ND ND ND	1.79 0.651 0.807	4.00 2.00 0.900	8.00 8.00 8.00		IS IS IS	13C3-PFBS 13C2-PFOA 13C8-PFOS	98.2 93.2 82.8	60 - 150 60 - 150 60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.



#### DATA VALIDATION SUMMARY REPORT COUPEVILLE, WASHINGTON

Client:	CH2M HILL, Inc., Corvallis, Oregon
SDG:	1700293
Laboratory:	Vista Analytical Laboratory, El Dorado Hills, California
Site:	Coupeville, CTO-0008, Washington
Date:	March 24, 2017

		PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-CV-GW02S-0317	1700293-01	Water
2	WI-CV-GW02SP-0317	1700293-02	Water
3	WI-CV-GW04S-0317	1700293-03	Water
4	WI-CV-GW04SP-0317	1700293-04	Water
5	WI-CV-GW02M-0317	1700293-05	Water
6	WI-CV-GW12D-0317	1700293-06	Water
6MS	WI-CV-GW12D-0317MS	1700293-06MS	Water
6MSD	WI-CV-GW12D-0317MSD	1700293-06MSD	Water
7	WI-CV-EB09-030117	1700293-07	Water
8	WI-CV-GW08S-0317	1700293-08	Water
9	WI-CV-FB01-030217	1700293-09	Water
10	WI-CV-EB10-030217	1700293-10	Water
11	WI-CV-EB11-030217	1700293-11	Water

A full data validation was performed on the analytical data for seven water samples, three aqueous equipment blank samples, and one field blank sample collected on March 1-2, 2017 by CH2M HILL at the Coupeville site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

<u>Analysis</u>	Method References
PFCs	USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM), Version 5.0 (July 2013) and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," August 2014;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

## Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate recovery (%R)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Ongoing Precision and Recovery (OPR)
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

## Data Usability Assessment

There were no rejections of data.

Overall the data is acceptable for the intended purposes. There were no qualifications.

# Perfluorinated Compounds (PFCs)

# Data Completeness, Case Narrative & Custody Documentation

• The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

# Holding Times

• All samples were extracted within 14 days for water samples and analyzed within 28 days.

# Initial Calibration

• All percent difference (%D) and/or correlation coefficients criteria were met.

# **Continuing Calibration**

• All percent difference (%D) and RRF criteria were met.

## Method Blank

• The method blanks were free of contamination.

## Field QC Blank

• The field blank samples were free of contamination except for the following.

Blank ID	Compound	Conc.	Qualifier	Affected Samples
		ng/L		
WI-CV-EB09-030117	None - ND		-	5
WI-CV-FB01-030217	None - ND	(m)	-	H
WI-CV-EB10-030217	None - ND	(		-
WI-CV-EB11-030217	None - ND			2

## Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

# Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

• The MS/MSD sample exhibited acceptable %R and RPD values.

## Ongoing Precision and Recovery (OPR)

• The OPR samples exhibited acceptable percent recoveries (%R) values.

# **Target Compound Identification**

• All mass spectra and quantitation criteria were met.

## **Compound Quantitation**

• Several samples were analyzed at various dilutions due to high concentrations of the target compounds. Reporting limits were adjusted accordingly. No action was required.

## Field Duplicate Sample Precision

• Field duplicate results are summarized below. The precision was acceptable.

Compound	WI-CV-GW02S-0317 ng/L	WI-CV-GW02SP-0317 ng/L	RPD	Qualifier
PFBS	332	357	7%	None
PFOA	571	564	1%	
PFOS	54.7	53.0	3%	

Compound	WI-CV-GW04S-0317 ng/L	WI-CV-GW04SP-0317 ug/L	RPD	Qualifier
None - ND		÷	5	a .

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

<u>Nancy Weaver</u> Dated: <u>3/24/17</u> Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID:	WI-CV-GW02S-0317								Modifie	d EPA Met	thod 537
Client Data			Sample Data			Labor	atory	7 Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab	Samp	le: 1700293-01	Date Received:	04-Mar-2017	9:49
Project:	Navy Clean CTO-08		Sample Size:	0.131 L		QC I	Batch:	: B7C0017	Date Extracted:	06-Mar-2017	8:15
Date Collected:	01-Mar-2017 11:00					Date	Anal	yzed: 06-Mar-17 18:45	Column: BEH C18		
Location:	MW-02S							07-Mar-17 09:51	Column: BEH C18		
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifi	iers		Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	332	17.1	38.2	76.3	D		IS	13C3-PFBS	112	60-150	$\mathbf{\mathcal{V}}$
PFOA	571	0.621	1.91	7.63	·		IS	13C2-PFOA	78.6	60-150	
PFOS	54.7	0.770	0.859	7.63			IS	13C8-PFOS	94.0	60-150	

RL Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes

Sample ID:	WI-CV-GW02SP-0317								Modifie	ed EPA Me	thod 537
Client Data			Sample Data			Labo	orator	y Data			
Name:	CH2M Hill		Matrix:	Groundwater	[	Lat	o Samp	ple: 1700293-02	Date Received:	04-Mar-2017	7 9:49
Project:	Navy Clean CTO-08		Sample Size:	0.129 L		QC	Batch	a: B7C0017	Date Extracted:	06-Mar-2017	8:15
Date Collected	01-Mar-2017 11:05					Dat	te Anal	lyzed: 06-Mar-17 18:58 Col	umn: BEH C18		
Location:	MW-02S							07-Mar-17 10:04 Col	umn: BEH C18		
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Quali	fiers		Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	357	17.3	38.8	77.4	Ø		IS	13C3-PFBS	112	60-150	D⁄
PFOA	564	0.630	1.94	7.74			IS	13C2-PFOA	86.4	60 - 150	
PFOS	53.0	0.781	0.872	7.74		J	IS	13C8-PFOS	90.4	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers

Only the linear isomer is reported for all other analytes.

Sample ID:	WI-CV-GW04S-0317							Modifie	ed EPA Me	thod 537
Client Data			Sample Data			Laborato	ry Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab San	nple: 1700293-03	Date Received:	04-Mar-201	7 9:49
Project:	Navy Clean CTO-08		Sample Size:	0.1 <b>28</b> L		QC Bate	ch: B7C0017	Date Extracted:	06-Mar-201	7 8:15
Date Collected	01-Mar-2017 13:25					Date An	alyzed: 06-Mar-17 19:10 Colu	ımn: BEH C18		
Location:	MW-04S									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Quali	fiers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.75	3.91	7.83		IS	13C3-PFBS	98.7	60 - 150	
PFOA	ND	0.637	1.95	7.83		IS	13C2-PFOA	83.2	60-150	
PFOS	ND	0.790	0.879	7.83		IS	13C8-PFOS	94.8	60-150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

Sample ID:	WI-CV-GW04SP-0317							Modifie	d EPA Me	thod 537
Client Data			Sample Data		L	aborator	y Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Samp	ple: 1700293-04	Date Received:	04 <b>-Mar-2</b> 017	9:49
Project:	Navy Clean CTO-08		Sample Size:	0.131 L		QC Batch	B7C0017	Date Extracted:	06-Mar-2017	8:15
Date Collected:	01-Mar-2017 13:35					Datc Ana	lyzed: 06-Mar-17 19:23 Col	umn: BEH C18		
Location:	MW-04S									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifie	ers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.71	3.82	7.64		IS	13C3-PFBS	93.1	60-150	
PFOA	ND	0.621	1.91	7.64		IS	13C2-PFOA	82.6	60-150	
PFOS	ND	0.770	0.859	7.64		IS	13C8-PFOS	89.8	60= 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID:	WI-CV-GW02M-0317							Modifie	ed EPA Me	ethod 537
Client Data			Sample Data			Laborator	ry Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Sam	ple: 1700293-05	Date Received:	04-Mar-201	7 9:49
Project:	Navy Clean CTO-08		Sample Size:	0.129 L		QC Bate	h: B7C0017	Date Extracted:	06-Mar-201	7 8:15
Date Collected:	01-Mar-2017 13:55					Date Ana	alyzed: 06-Mar-17 20:13 Colu	mn: BEH C18		
Location:	MW-02M									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Quali	fiers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.74	3.88	7.76		IS	13C3-PFBS	96.4	60 - 150	
PFOA	ND	0.631	1.94	7.76		IS	I3C2-PFOA	86.0	60 - 150	
PFOS	ND	0.783	0.872	7.76		IS	13C8-PFOS	96.0	60-150	

DL - Detection limit RL - Reporting limit LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

												6
Sample ID:	WI-CV-GW12D-0317									Modifi	ed EPA M	ethod 537
Client Data			Sample Data			Labo	rator	y Data				
Name:	CH2M Hill		Matrix:	Groundwater		Lab	Samp	ole:	1700293-06	Date Received	04 <b>-</b> Mar-201	7 9:49
Project:	Navy Clean CTO-08		Sample Size:	0.1 <b>2</b> 6 L		QC	Batch	:	B7C0017	Date Extracted	: 06-Mar-201	7 8:15
Date Collected;	01-Mar-2017 16:50					Dat	e Anal	yzed:	06-Mar-17 20:26	Column: BEH C18		
Location:	MW-12D											
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Quali	ifiers		Labe	ed Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.78	3.97	7.96			IS	13C3-	PFBS	88.9	60 - 150	
PFOA	ND	0.648	1.98	7.96			IS	13C2	PFOA	82.0	60-150	
PFOS	ND	0.803	0.893	7.96			IS	13C8	PFOS	84.0	60-150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID:	WI-CV-EB09-030117							Modifie	d EPA Met	thod 537
Client Data			Sample Data		1	Laborator	y Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Sam	ple: 1700293-07	Date Received:	04-Mar-2017	9:49
Project:	Navy Clean CTO-08		Sample Size:	0.115 L		QC Batc	h: B7C0017	Date Extracted:	06-Mar-2017	8:15
Date Collected:	01-Mar-2017 14:00					Date Ana	lyzed: 06-Mar-17 20:38 Colu	mn: BEH C18		
Location:	EB-09									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifi	ers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.94	4.35	8.69		IS	13C3-PFBS	90.8	60 - 150	
PFOA	ND	0.707	2.17	8.69		IS	13C2-PFOA	86.1	60 - 150	
PFOS	ND	0.877	0.978	8.69		IS	13C8-PFOS	95.5	60-150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

Sample ID:	WI-CV-GW08S-0317							Modifie	d EPA Met	thod 537
Client Data			Sample Data		L	aboratory	' Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Samp	le: 1700293-08	Date Received:	04-Mar-2017	9:49
Project:	Navy Clean CTO-08		Sample Size:	0.130 L	(	QC Batch	: B7C0017	Date Extracted:	06-Mar-2017	8:15
Date Collected:	02-Mar-2017 10:50					Date Anal	yzed: 06-Mar-17 20:51 Colu	ımn: BEH C18		
Location:	MW-08S									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifier	rs	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.72	3.85	7.71		IS	13C3-PFBS	101	60 - 150	
PFOA	ND	0.627	1.92	7.71		IS	13C2-PFOA	92.3	60-150	
PFOS	ND	0.777	0.865	7.71		IS	13C8-PFOS	76.9	60-150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL



Sample ID:	WI-CV-FB01-030217							Modifie	d EPA Me	thod 537
Client Data			Sample Data			Laborator	Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Samp	ole: 1700293-09	Date Received:	04-Mar-2017	9:49
Project:	Navy Clean CTO-08		Sample Size:	0.119 L		QC Batch	: B7C0017	Date Extracted:	06-Mar-2017	8:15
Date Collected:	02-Mar-2017 13:00					Date Ana	yzed: 06-Mar-17 21:03 Colu	mn: BEH C18		
Location:	FB01									
Алајуте	Conc. (ng/L)	DL	LOD	LOQ	Qualif	iers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.87	4.20	8.37		IS	13C3-PFBS	103	60 - 150	
PFOA	ND	0.681	2.10	8.37		IS	13C2-PFOA	85.9	60 - 150	
PFOS	ND	0.845	0.945	8.37		IS	13C8-PFOS	84.0	60-150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers

Only the linear isomer is reported for all other analytes

Sample ID:	WI-CV-EB10-030217							Modifie	d EPA M	ethod 537
Client Data			Sample Data			aboratory	Data			
Name:	CH2M Hill		Matrix:	Groundwater	1	Lab Samp	le: 1700293-10	Date Received:	04-Mar-201	7 9:49
Project:	Navy Clean CTO-08		Sample Size:	0.0930 L		QC Batch	B7C0017	Date Extracted:	06-Mar-201	7 8:15
Date Collected:	02-Mar-2017 13:15					Date Anal	yzed: 06-Mar-17 21:16 Colu	mn: BEH C18		
Location:	EB10									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifie	rs	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	2.41	5.38	10.8		IS	13C3-PFBS	105	60-150	
PFOA	ND	0.875	2.69	10.8		IS	13C2-PFOA	92.4	60 - 150	
PFOS	ND	1.08	1.21	10.8		IS	13C8-PFOS	97.0	60 - 150	

RL=Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

1~ 3/24/1+

Sample ID:	WI-CV-EB11-030217							Modifie	ed EPA Met	hod 537
Client Data			Sample Data		La	aborator	y Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Samp	ble: 1700293-11	Date Received:	04-Mar-2017	9:49
Project:	Navy Clean CTO-08		Sample Size:	0.118 L		QC Batch	: B7C0017	Date Extracted:	06-Mar-2017	8:15
Date Collected:	02-Mar-2017 13:30					Date Anal	lyzed: 06-Mar-17 21:28 Colum	nn: BEH C18		
Location:	EB11									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifier	rs	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.89	4.24	8.46		IS	13C3-PFBS	103	60 - 150	
PFOA	ND	0.689	2.12	8.46		IS	13C2-PFOA	85.0	60 - 150	
PFOS	ND	0.854	0.953	8.46		IS	13C8-PFOS	97.5	60-150	
2	DI - Detection limit					LCL UC	L Louver control limit upper control lin	uit		

DL - Detection limit

RL Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.


#### DATA VALIDATION SUMMARY REPORT COUPEVILLE, WASHINGTON

Client:	CH2M HILL, Inc., Corvallis, Oregon
SDG:	1700296
Laboratory:	Vista Analytical Laboratory, El Dorado Hills, California
Site:	Coupeville, CTO-0008, Washington
Date:	March 24, 2017

		PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-CV-GW08M-0317	1700296-01	Water
2	WI-CV-EB12-030317	1700296-02	Water
3	WI-CV-GW07S-0317	1700296-03	Water
4	WI-CV-EB13-030417	1700296-04	Water
5	WI-CV-GW14M-0317	1700296-05	Water
6	WI-CV-GW13S-0317	1700296-06	Water
7	WI-CV-GW07M-0317	1700296-07	Water
8	WI-CV-EB14-030417	1700296-08	Water

A full data validation was performed on the analytical data for five water samples and three aqueous equipment blank samples collected on March 3-4, 2017 by CH2M HILL at the Coupeville site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

<u>Analysis</u>	Method References
PFCs	USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM), Version 5.0 (July 2013) and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," August 2014;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

# Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate recovery (%R)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Ongoing Precision and Recovery (OPR)
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

## Data Usability Assessment

There were no rejections of data.

Overall the data is acceptable for the intended purposes. There were no qualifications.

# Perfluorinated Compounds (PFCs)

### Data Completeness, Case Narrative & Custody Documentation

• The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

# Holding Times

• All samples were extracted within 14 days for water samples and analyzed within 28 days.

### Initial Calibration

• All percent difference (%D) and/or correlation coefficients criteria were met.

# Continuing Calibration

• All percent difference (%D) and RRF criteria were met.

### Method Blank

• The method blanks were free of contamination.

# Field QC Blank

• The equipment blank samples were free of contamination.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-CV-EB12-030317	None - ND	1.00	100	=
WI-CV-EB13-030417	None - ND	1 <del>-</del> -	(m);	-
WI-CV-EB14-030417	None - ND	( <del>e</del> )	(-):	-
WI-CV-FB01-030217	None - ND	(m)		-
(SDG 1700293)		-		

### Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

## Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

• A MS/MSD sample was not collected.

### Ongoing Precision and Recovery (OPR)

• The OPR samples exhibited acceptable percent recoveries (%R) values.

# Target Compound Identification

• All mass spectra and quantitation criteria were met.

### **Compound Quantitation**

• All criteria were met.

### Field Duplicate Sample Precision

• Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Many Weaver Dated: 3/24/17

Senior Chemist

Data Qualifiet	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Sample ID:	WI-CV-GW08M-0317								Modifie	d EPA Me	thod 537
Client Data			Sample Data			Labor	ratory	Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab	Samp	le: 1700296-01	Date Received:	07-Mar-2017	/ 10:32
Project:	Navy Clean CTO-08		Sample Size:	0.1 <b>2</b> 8 L		QC I	Batch	B7C0034	Date Extracted:	08-Mar-2017	/ 8:40
Date Collected:	04-Mar-2017 12:00					Date	Anal	yzed: 09-Mar-17 16:51 Co	lumn: BEH C18		
Location:	MW-08M										
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualif	fiers		Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.74	3.91	7.79			IS	13C3-PFBS	117	60 - 150	
PFOA	ND	0.634	1.95	7.79			IS	13C2-PFOA	91.9	60 - 150	
PFOS	ND	0.786	0.879	7.79			IS	13C8-PFOS	110	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID:	WI-CV-EB12-030317							Modifie	d EPA Me	thod 537
Client Data			Sample Data			Laborator	y Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Sam	ple: 1700296-02	Date Received:	07 <b>-M</b> ar-2017	7 10:32
Project:	Navy Clean CTO-08		Sample Size:	0.121 L		QC Batcl	h: B7C0034	Date Extracted:	08-Mar-2017	7 8:40
Date Collected:	03-Mar-2017 17:15					Date Ana	lyzed: 09-Mar-17 17:03 Colu	mn: BEH C18		
Location:	EB12									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifi	iers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.85	4.13	8.28		IS	13C3-PFBS	105	60 - 150	
PFOA	ND	0.674	2.07	8.28		IS	13C2-PFOA	81.9	60-150	
PFOS	ND	0.836	0.930	8.28		IS	13C8-PFOS	101	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes

Work Order 1700296

Sample ID:	WI-CV-GW07S-0317							Modifie	ed EPA Me	thod 537
Client Data			Sample Data			Laborator	y Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Samp	ble: 1700296-03	Date Received:	07-Mar-2017	7 10:32
Project:	Navy Clean CTO-08		Sample Size:	0.114 L		QC Batch	B7C0034	Date Extracted	08-Mar-2017	7 8:40
Date Collected:	04-Mar-2017 13:25					Date Ana	lyzed: 09-Mar-17 17:16 Colu	mn: BEH C18		
Location:	MW-07S									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifi	iers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.97	4.39	8.81		IS	13C3-PFBS	112	60-150	
PFOA	ND	0.717	2.19	8.81		IS	13C2-PFOA	91.0	60-150	
PFOS	ND	0.889	0.987	8.81		IS	13C8-PFOS	123	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID:	WI-CV-EB13-030417							Modifie	ed EPA M	ethod 537
Client Data			Sample Data			Laborator	y Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Sam	ple: 1700296-04	Date Received	07-Mar-201	7 10:32
Project:	Navy Clean CTO-08		Sample Size:	0.124 L		QC Batcl	n: B7C0034	Date Extracted	08-Mar-201	7 8:40
Date Collected:	04-Mar-2017 14:30				1	Date Ana	lyzed: 09-Mar-17 17:28 Colu	umn: BEH C18		
Location:	EB-13									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualif	iers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.81	4.03	8.08		IS	13C3-PFBS	101	60 - 150	
PFOA	ND	0.657	2.02	8.08		IS	13C2-PFOA	89.1	60-150	0
PFOS	ND	0.815	0.907	8.08		IS	13C8-PFOS	107	60-150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID:	WI-CV-GW14M-0317							Modifie	ed EPA M	ethod 537
Client Data			Sample Data		L	aborator	y Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Samp	ble: 1700296-05	Date Received:	07-Mar-20	10:32
Project:	Navy Clean CTO-08		Sample Size:	0.123 L		QC Batch	: B7C0034	Date Extracted:	08-Mar-20	17 8:40
Date Collected:	04-Mar-2017 17:00					Date Anal	yzed: 09-Mar-17 17:41 Colu	mn: BEH C18		
Location:	MW-14M					-				
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifie	ers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	111	1.82	4.07	8.14		IS	13C3-PFBS	95.5	60 - 150	
PFOA	166	0.662	2.03	8.14		IS	13C2-PFOA	95.4	60-150	
PFOS	0.898	0.821	0.915	8.14	J	IS	13C8-PFOS	122	60-150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers

Only the linear isomer is reported for all other analytes.

Sample ID:	WI-CV-GW13S-0317							Modifie	ed EPA Me	ethod 537
Client Data			Sample Data			Laborator	y Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Sam	ple: 1700296-06	Date Received:	07-Mar-201	7 10:32
Project:	Navy Clean CTO-08		Sample Size:	0.123 L		QC Batc	h: B7C0034	Date Extracted:	08-Mar-201	7 8:40
Date Collected:	03-Mar-2017 17:05					Date Ana	alyzed: 09-Mar-17 17:53 Colu	mn: BEH C18		
Location:	MW-13S									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Quali	fiers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.81	4.07	8.11		IS	13C3-PFBS	101	60 - 150	
PFOA	ND	0.660	2.03	8.11		IS	13C2-PFOA	89.4	60-150	
PFOS	ND	0.818	0.915	8.11		IS	13C8-PFOS	119	60-150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID:	WI-CV-GW07M-0317								Modifie	d EPA Me	thod 537
Client Data			Sample Data			Labo	ratory	Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab	Sampl	le: 1700296-07	Date Received:	07-Mar-2017	10:32
Project:	Navy Clean CTO-08		Sample Size:	0.1 <b>2</b> 8 L		QC	Batch:	B7C0034	Date Extracted:	08-Mar-2017	8:40
Date Collected:	04-Mar-2017 17:15					Date	e Analy	yzed: 09-Mar-17 18:06 Colu	mn: BEH C18		
Location:	MW-07M										
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Quali	fiers		Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.75	3.91	7.80			IS	13C3-PFBS	112	60 - 150	
PFOA	ND	0.635	1.95	7.80			IS	13C2-PFOA	90.0	60 - 150	
PFOS	0.844	0.787	0.879	7.80	J		IS	13C8-PFOS	124	60 - 150	

NW 3/24/17

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes

Sample ID:	WI-CV-EB14-030417							Modifie	d EPA M	ethod 537
Client Data			Sample Data			Laborator	y Data			
Name:	CH2M Hill		Matrix:	Groundwater		Lab Samp	ble: 1700296-08	Date Received:	07-Mar-201	7 10:32
Project:	Navy Clean CTO-08		Sample Size:	0.1 <b>28</b> L	- 1	QC Batch	B7C0034	Date Extracted:	08-Mar-201	7 8:40
Date Collected:	04-Mar-2017 17:45					Date Ana	lyzed: 09-Mar-17 18:18 Colu	ımn: BEH C18		
Location:	EB-14									
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Quali	fiers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.75	3.91	7.82		IS	13C3-PFBS	110	60 - 150	
PFOA	ND	0.636	1.95	7.82		IS	13C2-PFOA	102	60 - 150	
PFOS	ND	0.789	0.879	7.82		IS	13C8-PFOS	114	60-150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.