Compliance Monitoring Plan Addendum

Former Shell Oil Tank Farm Site
Anacortes, Washington
Ecology Consent Decree No. 14-2-01249-0

for

Washington State Department of Ecology
on Behalf of Port of Anacortes

July 14, 2015

GeoEngineers
Earth Science + Technology

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GeoEngineers
Plaza 600 Building
600 Stewart Street, Suite 1700
Seattle, Washington 98101
206.728.2674

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Former Shell Oil Tank Farm Site
Anacortes, Washington
Ecology Consent Decree No. 14-2-01249-0

File No. 5147-012-07

July 14, 2015

Prepared for:

Washington State Department of Ecology
PO Box 47600
Olympia, Washington 98504-7600

Attention: Arianne Fernandez

Prepared by:

GeoEngineers, Inc.
Plaza 600 Building
600 Stewart Street, Suite 1700
Seattle, Washington 98101
206.728.2674

Robert Trahan
Environmental Geologist

John M. Herzog, PhD, LG
Principal

RST:JMH:leh

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INTRODUCTION

This document is being presented as an addendum to the Washington State Department of Ecology (Ecology) approved Compliance Monitoring Plan (CMP; GeoEngineers, 2014a) for post-construction groundwater monitoring at the Former Shell Oil Tank Farm Site (Site). The Site is formally referenced in the Ecology databases as the Former Shell Oil Tank Farm Site (Ecology Facility Site Identification No. 4781157) and is generally located between 13th and 14th Streets west of Q Avenue in Anacortes, Washington (Figure 1). The Site is being managed by Ecology as part of the Fidalgo and Padilla Bay component of the Puget Sound Initiative program.

Pursuant to the Cleanup Action Plan (CAP; Ecology, 2014), Engineering Design Report (EDR; GeoEngineers, 2014b) and Consent Decree No. 14-2-01249-0 filed with the Skagit County Superior Court on July 14, 2014, post-construction groundwater monitoring will be performed by the Port of Anacortes (Port) to verify the effectiveness of the cleanup action implemented for the Site. The primary purpose of this document is to describe the post-construction groundwater monitoring activities that will be performed at the Site and is to be used in conjunction with the Quality Assurance Project Plan (QAPP) and Health and Safety Plan (HASP) included as appendices to the CMP. Specific details of the implemented cleanup action are presented in the Construction Completion (As-Built) Report (GeoEngineers, 2015). Post-construction groundwater monitoring activities are presented below.

POST-CONSTRUCTION GROUNDWATER MONITORING

Post-construction groundwater monitoring will be performed at the Site to monitor groundwater conditions to evaluate the effectiveness of the cleanup action. Groundwater samples will be analyzed for indicator hazardous substances listed in Table 1 to ensure that groundwater downgradient of Site, specifically the area in which residual soil contamination remains in place following implementation of the cleanup action, meet the performance criteria established for the Site. In accordance with the CAP and EDR, existing monitoring wells at the Site will be sampled on a quarterly basis for at least one year. Further monitoring requirements will be evaluated by Ecology following completion of the initial year of monitoring.

The following sections describe the performance criteria, monitoring well locations, and sampling procedures for the post-construction groundwater monitoring program.

Performance Criteria

In accordance with the CMP, the Site is considered to be in compliance when contaminant concentrations for indicator hazardous substances in groundwater including, gasoline-, diesel- and heavy oil-range petroleum hydrocarbons, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), benzene and cadmium are less than site-specific cleanup levels (Table 1) at the point of compliance for four consecutive monitoring events. If one or more of the indicator hazardous substances are detected at concentrations exceeding the site-specific cleanup levels presented in Table 1, the Port and Ecology, based on discussions between the Port and Ecology and implemented at the approval of Ecology, will determine the approach and necessary measures to address exceedances and meet cleanup objectives. At the least, additional compliance groundwater monitoring may be necessary to further evaluate post-construction groundwater conditions. If additional groundwater monitoring becomes necessary based on the results of the four initial monitoring events, the sampling location, frequency and indicator hazardous substance will be determined based on discussions between the Port and Ecology and implemented at the approval of Ecology.

Monitoring Well Network

Existing groundwater monitoring wells GEI-MW-2, GEI-MW-4, GEI-MW-5 and GEI-MW-7 will be used to evaluate groundwater conditions within and/or downgradient of residual soil contamination. Monitoring wells GEI-MW-2, GEI-MW-4 and GEI-MW-5 are positioned downgradient of the remaining soil contamination between the Site and Fidalgo Bay. Monitoring well GEI-MW-7 is positioned at the conditional point of compliance along the Fidalgo Bay shoreline groundwater/surface water interface.

The final limits of excavation completed to remove contaminated soil, approximate area of residual soil contamination remaining in place following implementation of the cleanup action and monitoring wells being utilized to evaluate post-construction groundwater conditions are shown on Figure 2. Monitoring well coordinates are presented in Table 2. Well construction details are summarized in Table 3. Well Construction logs for monitoring wells GEI-MW-2, GEI-MW-4, GEI-MW-5 and GEI-MW-7 are presented in Appendix A.

Groundwater Sampling and Analysis

Groundwater samples will be collected from each monitoring well and analyzed for indicator hazardous substances presented in Table 1 to evaluate whether residual soil contamination is adversely impacting groundwater at the Site. Groundwater sampling procedures are summarized below.

Groundwater Sampling Procedure

Groundwater levels will be measured at each monitoring well location prior to purging and sample collection during each monitoring event to the nearest 0.01 foot prior to sampling using an electric water level indicator (e-tape). The water levels will be recorded relative to the surveyed casing rim elevations. Monitoring well casing rim elevations are summarized in Table 3.

Monitoring well GEI-MW-7 located within the zone of tidal influence (i.e., 200 feet from the shoreline based on previous tidal studies) will be sampled within one hour of the lowest day-time tide level for each sampling event to the extent practicable. Groundwater samples will be obtained using low-flow/low-turbidity sampling techniques to minimize the suspension of sediment in groundwater samples. Using a peristaltic pump and dedicated polyethylene tubing, groundwater will be pumped from the well at a rate not to exceed 0.5 liter per minute to minimize drawdown. The base of the tubing (i.e., intake) will be positioned at the approximate midpoint of the observed water column. A Horiba U-50 series water quality measuring unit (or equivalent) with flow-through-cell will be used to monitor the following water quality parameters during purging:

- Electrical conductivity (EC),
- Dissolved oxygen (DO),
- Acidity (pH),
- Total dissolved solids (TDS),
- Oxygen reduction potential (ORP),
- Turbidity,
- Salinity, and
- Temperature.

Water samples will be obtained after these parameters vary by less than 10 percent on three consecutive measurements (i.e., ambient groundwater conditions). The stabilized field measurements will be documented in the field log. Following well purging, the flow-through cell will be disconnected and groundwater samples will be collected in laboratory-prepared containers. Groundwater will be collected from the new and existing monitoring wells and submitted to an Ecology-certified laboratory for analyses of indicator hazardous substances listed above. Both field-filtered and unfiltered samples for metals (cadmium) analysis will be collected. Reusable sampling equipment that comes in contact with groundwater will be decontaminated before each use. Decontamination procedures for this equipment are described in the QAPP (Appendix A of the CMP).

The samples will be placed into a cooler with ice and logged on chain-of-custody forms following the procedures described in the QAPP. Purge water removed from the monitoring wells and decontamination water generated during all sampling activities will be stored on Site in labeled and sealed 55-gallon drums. The drums will be stored temporarily at a secure location on Port property pending receipt of analytical results and off-site disposal at a permitted facility. Incidental waste generated during sampling activities includes items such as gloves, plastic sheeting, sample tubing, paper towels and similar expended and discarded field supplies. These materials are considered *de minimis* (Ecology, 2006) and will be disposed of in a local trash receptacle or county disposal facility.

Chemical Analysis

Water samples collected from monitoring wells GEI-MW-2, GEI-MW-4, GEI-MW-5 and GEI-MW-7 will be submitted to an Ecology accredited laboratory for one or more of the following:

- Gasoline-range petroleum hydrocarbons by NWTPH-Gx;
- Diesel- and heavy oil-range petroleum hydrocarbons by NWTPH-Dx;
- Benzene by EPA Method 8260;
- Total and dissolved cadmium by EPA Method 6010; and
- cPAHs by EPA Method 8270SIM.

Table 4 presents the sampling and analysis plan for post-construction groundwater monitoring. Sample handling procedures, including labeling, container and preservation are described in the QAPP (Appendix A of the CMP). To measure the precision and consistency of laboratory analytical procedures and methods, as well as the consistency of the sampling techniques used by field personnel, a minimum of one duplicate sample will be collected during each monitoring event. In addition, a trip blank prepared by the testing laboratory will be analyzed for gasoline and benzene at a rate of one trip blank per cooler containing samples for gasoline and benzene analysis.

Monitoring Well Decommissioning

Upon receipt of approval from Ecology that the compliance monitoring is complete and the monitoring wells will no longer be used, monitoring wells will be decommissioned by a well driller licensed in the State of Washington in accordance with Ecology requirements (WAC 173-160-460).

QUALITY ASSURANCE AND CONTROL

Quality assurance/quality control (QA/QC) procedures and standards that will be implemented during post-construction groundwater monitoring activities are presented in the QAPP (Appendix A of the CMP). The purpose of this document is to describe the objectives, field sampling procedures, organization, and specific quality assurance and quality control activities designed to achieve data quality goals established for the project.

HEALTH AND SAFETY

Groundwater monitoring and sampling activities will be performed in accordance with the requirements of the Washington Industrial Safety and Health Act (Revised Code of Washington [RCW] 49.17) and the Federal Occupational Safety and Health Act (29 CFR 1910, 1926). These regulations include requirements that workers are to be protected from exposure to contaminants. A Site HASP describing actions that will be taken to protect the health and safety of GeoEngineers, Inc.'s (GeoEngineers) personnel is provided in Appendix B of the CMP.

REPORTING

The results of the post-construction groundwater monitoring will be provided to Ecology following each monitoring event as part of the project progress reporting. After completion of the four initial quarterly groundwater monitoring events, a Post-Construction Groundwater Monitoring Report summarizing the results of each quarterly groundwater monitoring event will be submitted to Ecology for review. Data generated as part of the groundwater monitoring program will be submitted to Ecology in the format required by Environmental Information Management (EIM) Policy 840 following completion of data review and validation.

LIMITATIONS

This report has been prepared for the exclusive use of the Port of Anacortes, their authorized agents and regulatory agencies in their evaluation of the Former Shell Oil Tank Farm Site in Anacortes, Washington. No other party may rely on the product of our services unless we agree in advance and in writing to such reliance.

Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

REFERENCES

GeoEngineers, Inc. (GeoEngineers, 2014a), "Engineering Design Report, Former Shell Oil Tank Farm, Anacortes, Washington," GEI File No. 5147 012-04, prepared for the Washington State Department of Ecology on behalf of Port of Anacortes, July 29, 2014.

GeoEngineers, Inc. (GeoEngineers, 2014b), "Compliance Monitoring Plan, Former Shell Oil Tank Farm, Anacortes, Washington," GEI File No. 5147 012-04, prepared for the Washington State Department of Ecology on behalf of Port of Anacortes, July 29, 2014.

GeoEngineers, Inc. (GeoEngineers, 2015), "Construction Completion (As-Built) Report, Former Shell Oil Tank Farm, Anacortes, Washington, Ecology Consent Decree No. 14-2-01249-0," GEI File No. 5147 012-07, prepared for the Washington State Department of Ecology on behalf of Port of Anacortes, June 25, 2015.

Washington State Department of Ecology (Ecology, 2014b). "Cleanup Action Plan (CAP), Former Shell Oil Tank Farm Site, Anacortes, Washington," dated February 3, 2014.

TABLES

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Table 1

Cleanup Levels for Indicator Hazardous Substances

Former Shell Oil Tank Farm Site

Anacortes, Washington

Indicator Hazardous Substances	Groundwater Cleanup Level (µg/L)
Petroleum Hydrocarbons	
Gasoline-Range	800/1,000[2]
Diesel-Range	500
Heavy Oil-Range	500
Volatile Organic Compound (VOC)	
Benzene	23
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)	
Benzo(a)anthracene	0.02
Chrysene	0.02
Benzo(b)fluoranthene	0.02
Benzo(k)fluoranthene	0.018
Benzo(a)pyrene	0.018
Indeno(1,2,3-cd)pyrene	0.018
Dibenz(a,h)anthracene	0.018
Total cPAHs (TEC)	0.1
Metals	
Cadmium	8.0

Notes:

[1]Cleanup level is 30 mg/kg when benzene is present.

[2]Cleanup level is 800 µg/L when benzene is present.

µg/L = micrograms per liter

TEC = toxicity equivalency concentration

Table 2

Groundwater Monitoring Well Coordinates

Former Shell Oil Tank Farm

Anacortes, Washington

Monitoring Well[1]	Date Installed	Installed By	Ecology Well Identification	Latitude and Longitude Coodinates		Washington State Planes North Coordinates (NAD83)	
				Latitude (DMS)	Longitude (DMS)	Northing (feet)	Easting (feet)
GEI-MW-2	2/9/2012	GeoEngineers	BHM-141	48°30'39.8984"	-122°36'40.3647"	556187.51	1209502.34
GEI-MW-4	2/9/2012	GeoEngineers	BHM-144	48°30'41.7669"	-122°36'40.3141"	556376.73	1209510.12
GEI-MW-5	2/10/2012	GeoEngineers	BHM-146	48°30'41.3563"	-122°36'39.0529"	556333.16	1209594.05
GEI-MW-7	2/10/2012	GeoEngineers	BHM-147	48°30'42.4281"	-122°36'35.3598"	556436.01	1209845.16

Notes:

[1]Monitoring well locations are shown on Figure 2.

NAD83 = 1983 North American Datum

Table 3

Groundwater Monitoring Well Completion Data

Former Shell Oil Tank Farm

Anacortes, Washington

Monitoring Well[1]	Date Installed	Installed By	Ecology Well Identification	Ground Elevation (feet)	Top of Casing Elevation (feet)	Bottom of Casing Elevation (feet)	Total Well Depth (feet bgs)	Casing Diameter (inches)	Screen Interval (feet bgs)	Screen Specifications
GEI-MW-2	2/9/2012	GeoEngineers	BHM-141	13.4	12.98	-2.02	15	2	5 to 15	2-inch Schedule 40 PVC 0.010-inch slot
GEI-MW-4	2/9/2012	GeoEngineers	BHM-144	13.36	12.98	-2.02	15	2	5 to 15	2-inch Schedule 40 PVC 0.010-inch slot
GEI-MW-5	2/10/2012	GeoEngineers	BHM-146	13.05	12.67	-0.33	13	2	5 to 15	2-inch Schedule 40 PVC 0.010-inch slot
GEI-MW-7	2/10/2012	GeoEngineers	BHM-147	11.99	11.65	-8.35	20	2	5 to 20	2-inch Schedule 40 PVC 0.010-inch slot

Notes:

[1]Monitoring well locations are shown on Figure 2.

All borings were installed using hollow-stem auger (HAS) drilling methods.

All elevations referenced to Mean Lower Low Water (MLLW).

bgs = below ground surface

PVC = polyvinyl chloride

Table 4

Post-Construction Groundwater Sampling and Analysis Plan

Former Shell Oil Tank Farm

Anacortes, Washington

Monitoring Well[1]	Gasoline-Range Hydrocarbons (NWTPH-G)	Diesel-Range Hydrocarbons (NWTPH-Dx)	Heavy Oil-Range Hydrocarbons (NWTPH-Dx)	Benzene (EPA 8260)	Total Cadmium (EPA 6010)	Dissolved Cadmium (EPA 6010)
GEI-MW-2	X	X	X	X		
GEI-MW-4	X	X	X	X		
GEI-MW-5[2]	X	X	X	X	X	X
GEI-MW-7	X	X	X	X		

Notes:

[1]Monitoring well locations are shown on Figure 2.

[2]A field duplicate sample will be obtained from this location during each monitoring event.

EPA = Environmental Protection Agency

FIGURES

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N
W E
S

2,000 0 2,000

Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps

Projection: NAD 1983 UTM Zone 10N

Vicinity Map

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

Figure 1

Path: \\sea\projects\5\5147012\GIS\5147012_VicinityMap.mxd Map Revised: 09 January 2013 amanza

\\sea\projects\5\5147012\GIS\514701207_Compliance_Monitoring_Plan.mxd Date Exported: 06/30/15 by maugust

Legend

- Former Shell Oil Tank Farm Area (Approximate)
- Post Construction Groundwater Monitoring Well
- Cleanup Action Remedial Excavation Limit
- Approximate area of Residual TPH, Benzene and/or Cadmium Contaminated Soil

TPH = Petroleum Hydrocarbons (Gasoline, Diesel, and/or Heavy Oil)

N E S W

60 0 60

Feet

Site Plan

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

Figure 2

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial imagery provided by the Port of Anacortes. Imagery date:2014.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

APPENDICES

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APPENDIX A
Well Completion Logs

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% RETAINED ON NO. 200 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	CC	Cement Concrete
	AC	Asphalt Concrete
	CR	Crushed Rock/ Quarry Spalls
	TS	Topsoil/ Forest Duff/Sod

Measured groundwater level in exploration, well, or piezometer

Groundwater observed at time of exploration

Perched water observed at time of exploration

Measured free product in well or piezometer

Graphic Log Contact

Distinct contact between soil strata or geologic units

Approximate location of soil strata change within a geologic soil unit

Material Description Contact

Distinct contact between soil strata or geologic units

Approximate location of soil strata change within a geologic soil unit

Sampler Symbol Descriptions

2.4-inch I.D. split barrel

Standard Penetration Test (SPT)

Shelby tube

Piston

Direct-Push

Bulk or grab

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

A "P" indicates sampler pushed using the weight of the drill rig.

Laboratory / Field Tests

%F	Percent fines
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
OC	Organic content
PM	Permeability or hydraulic conductivity
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen
NT	Not Tested

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

KEY TO EXPLORATION LOGS

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FIGURE B-1

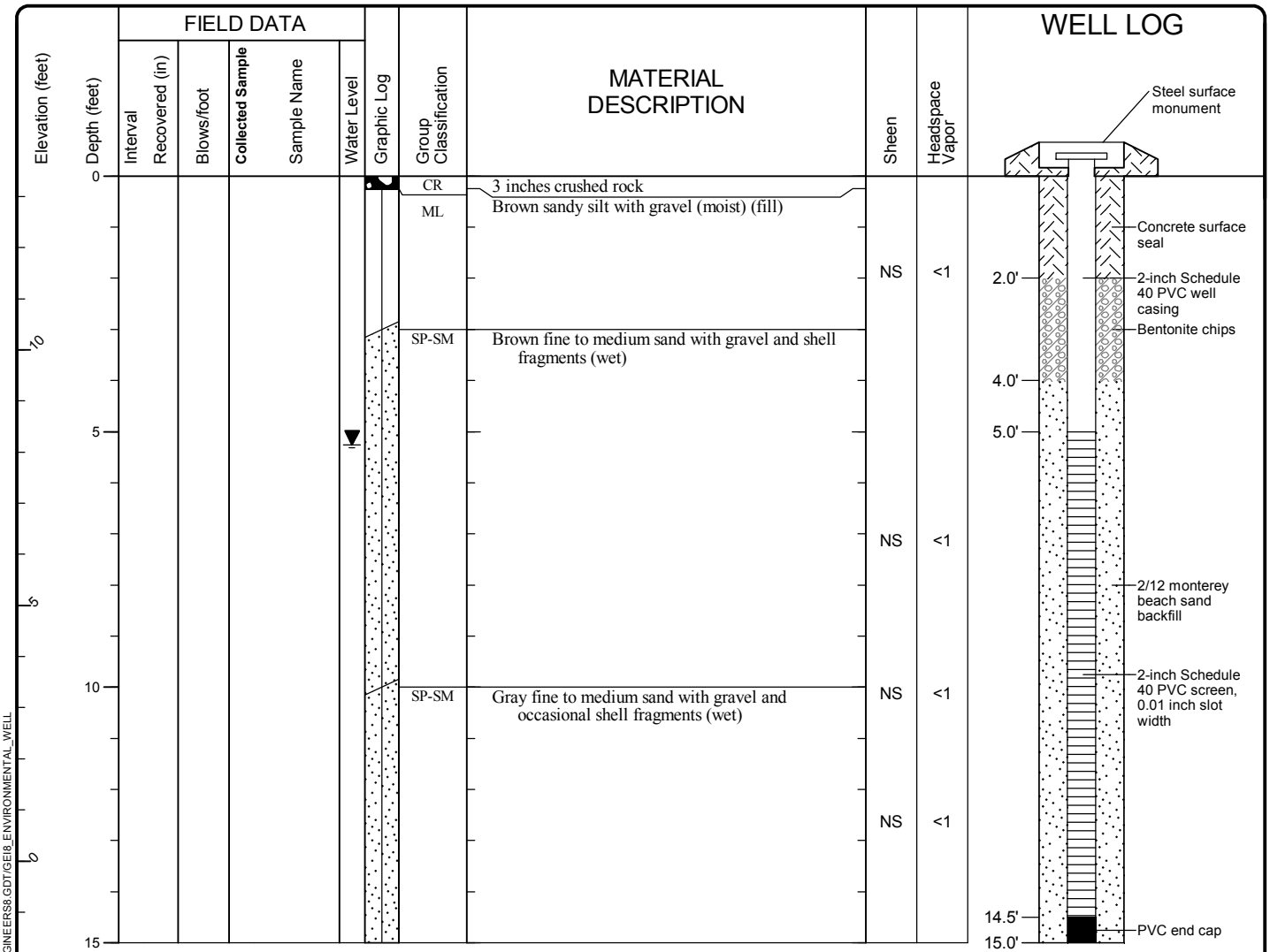
Drilled	Start	End	Total Depth (ft)	Logged By	Checked By	Driller	Drilling Method
	2/9/2012	2/9/2012	15	AJ	RST	Cascade Drilling, LP	Hollow Stem Auger

Hammer Data	N/A	Drilling Equipment	CME 75
Surface Elevation (ft) Vertical Datum	13.4 MLLW	Top of Casing Elevation (ft)	13.0
Easting (X) Northing (Y)	1209502.343 556187.508	Horizontal Datum	NAD83

Licensing agency well number: **BHM141**
A 2 (in) well was installed on 2/9/2012 to a depth of 15 (ft).

Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
3/6/2012	5.3	7.72

Notes: Air knife from 0 to 5 feet. No samples obtained, soil descriptions based on drill cuttings. PID malfunction - No head space vapor readings.



Note: See Figure B-1 for explanation of symbols.

Log of Monitoring Well GEI-MW-2

GeoEngineers

Project: Former Shell Oil Tank Farm
Project Location: Anacortes, Washington
Project Number: 5147-012-02

Figure B-3
Sheet 1 of 1

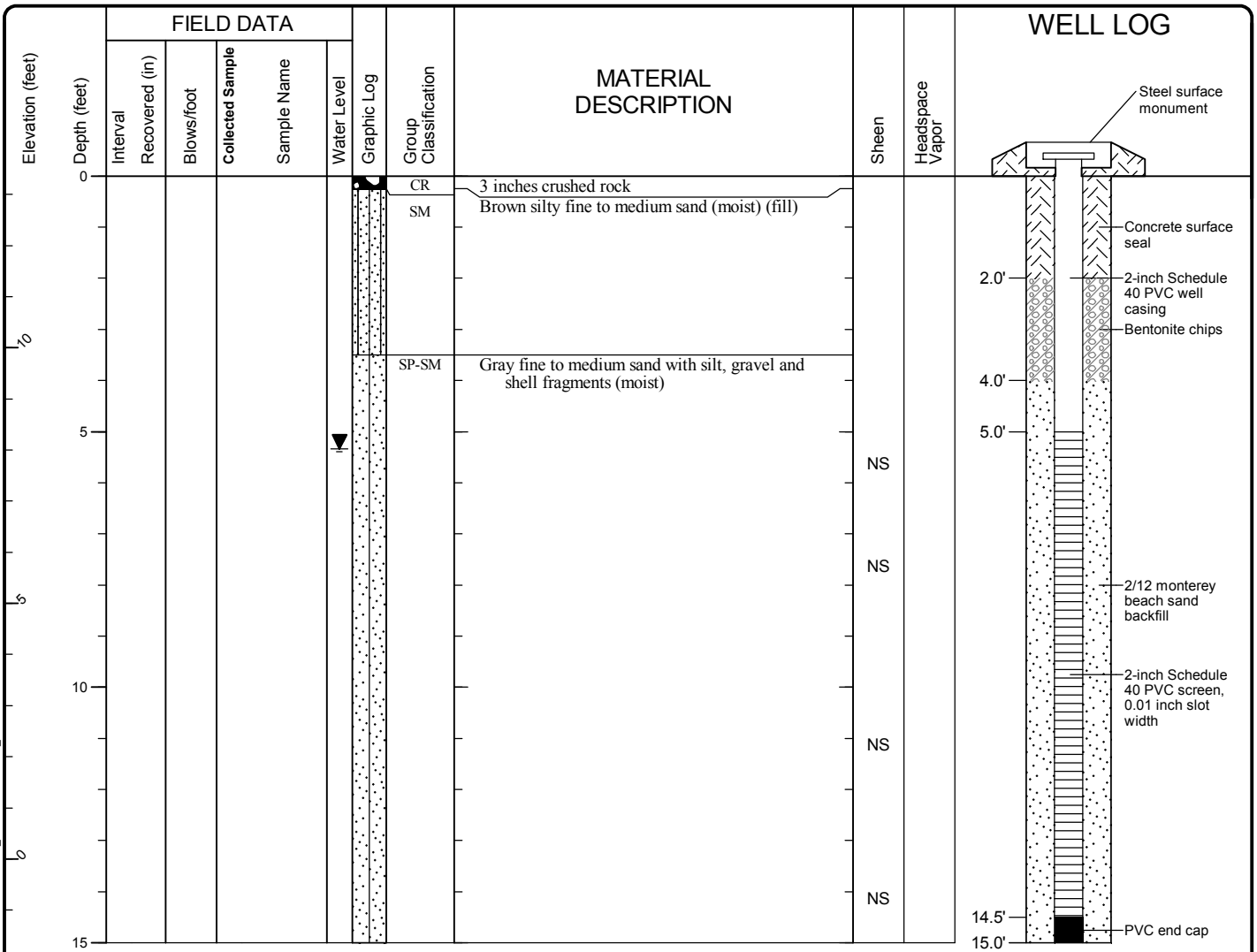
Drilled	Start	End	Total Depth (ft)	Logged By	Checked By	Driller	Drilling Method
	2/9/2012	2/9/2012	15	AJ	RST	Cascade Drilling, LP	Hollow Stem Auger

Hammer Data	N/A	Drilling Equipment	CME 75
Surface Elevation (ft) Vertical Datum	13.4 MLLW	Top of Casing Elevation (ft)	13.0
Easting (X) Northing (Y)	1209510.119 556376.7311	Horizontal Datum	NAD83

Licensing agency well number: **BHM144**
A 2 (in) well was installed on 2/9/2012 to a depth of 15 (ft).

Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
3/6/2012	5.3	7.64

Notes: Air knife from 0 to 5 feet. No samples obtained, soil descriptions based on drill cuttings. PID malfunction - No head space vapor readings.



Note: See Figure B-1 for explanation of symbols.

Log of Monitoring Well GEI-MW-4

GeoEngineers

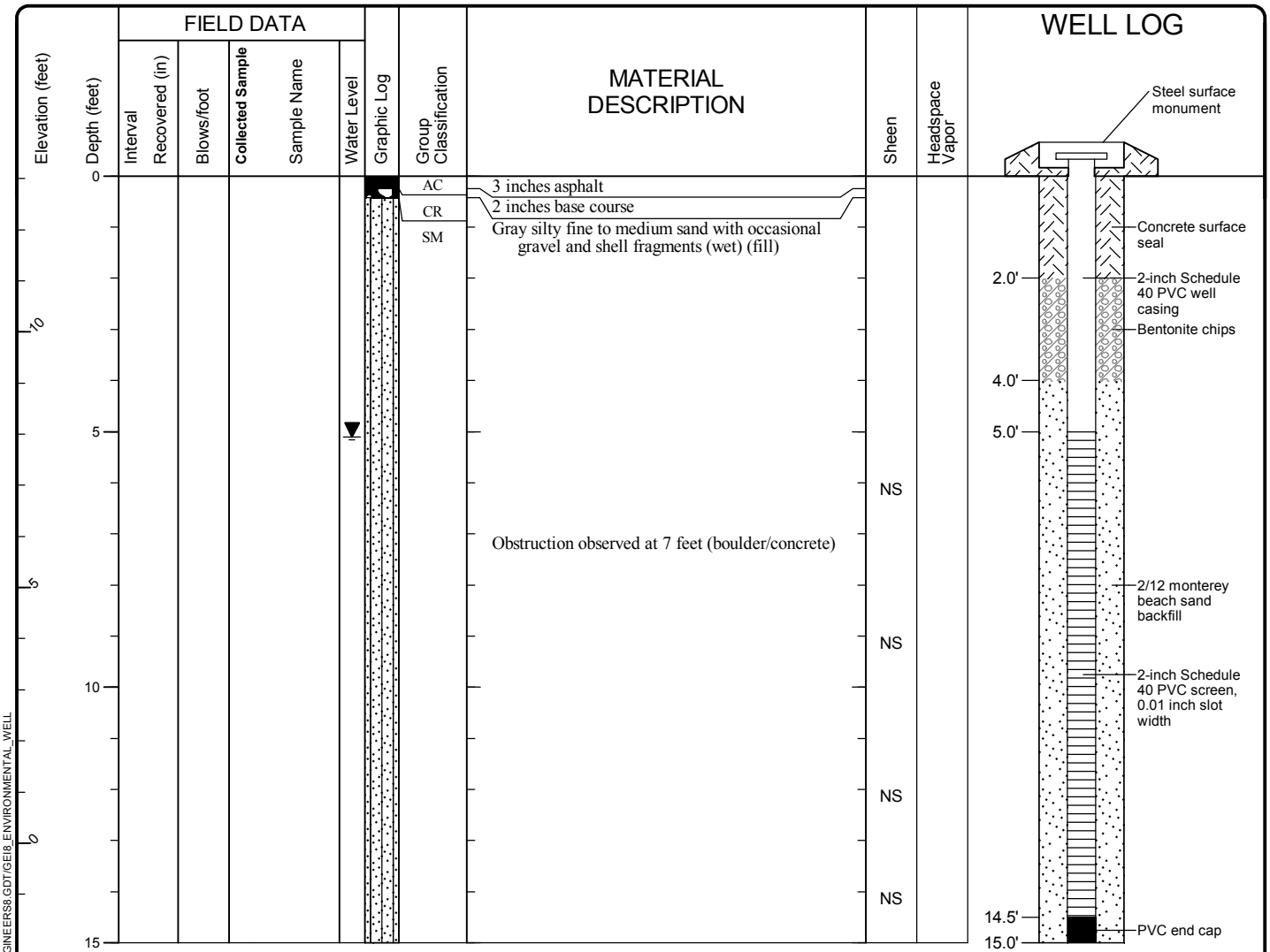
Project: Former Shell Oil Tank Farm
Project Location: Anacortes, Washington
Project Number: 5147-012-02

Figure B-5
Sheet 1 of 1

Drilled	Start	End	Total Depth (ft)	Logged By	Checked By	Driller	Drilling Method
	2/10/2012	2/10/2012	15	AJ	RST	Cascade Drilling, LP	Hollow Stem Auger

Hammer Data	N/A	Drilling Equipment	CME 75	Licensing agency well number: **BHM146** A 2 (in) well was installed on 2/10/2012 to a depth of 15 (ft).
Surface Elevation (ft) Vertical Datum	13.1 MLLW	Top of Casing Elevation (ft)	12.7	Groundwater Date Measured: 3/6/2012 Depth to Water (ft): 5.1 Elevation (ft): 7.57
Easting (X) Northing (Y)	1209594.048 556333.162	Horizontal Datum	NAD83	

Notes: Air knife from 0 to 5 feet. No samples obtained, soil descriptions based on drill cuttings. PID malfunction - No head space vapor readings.



Note: See Figure B-1 for explanation of symbols.

Log of Monitoring Well GEI-MW-5

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Project: Former Shell Oil Tank Farm
Project Location: Anacortes, Washington
Project Number: 5147-012-02

Figure B-6
Sheet 1 of 1

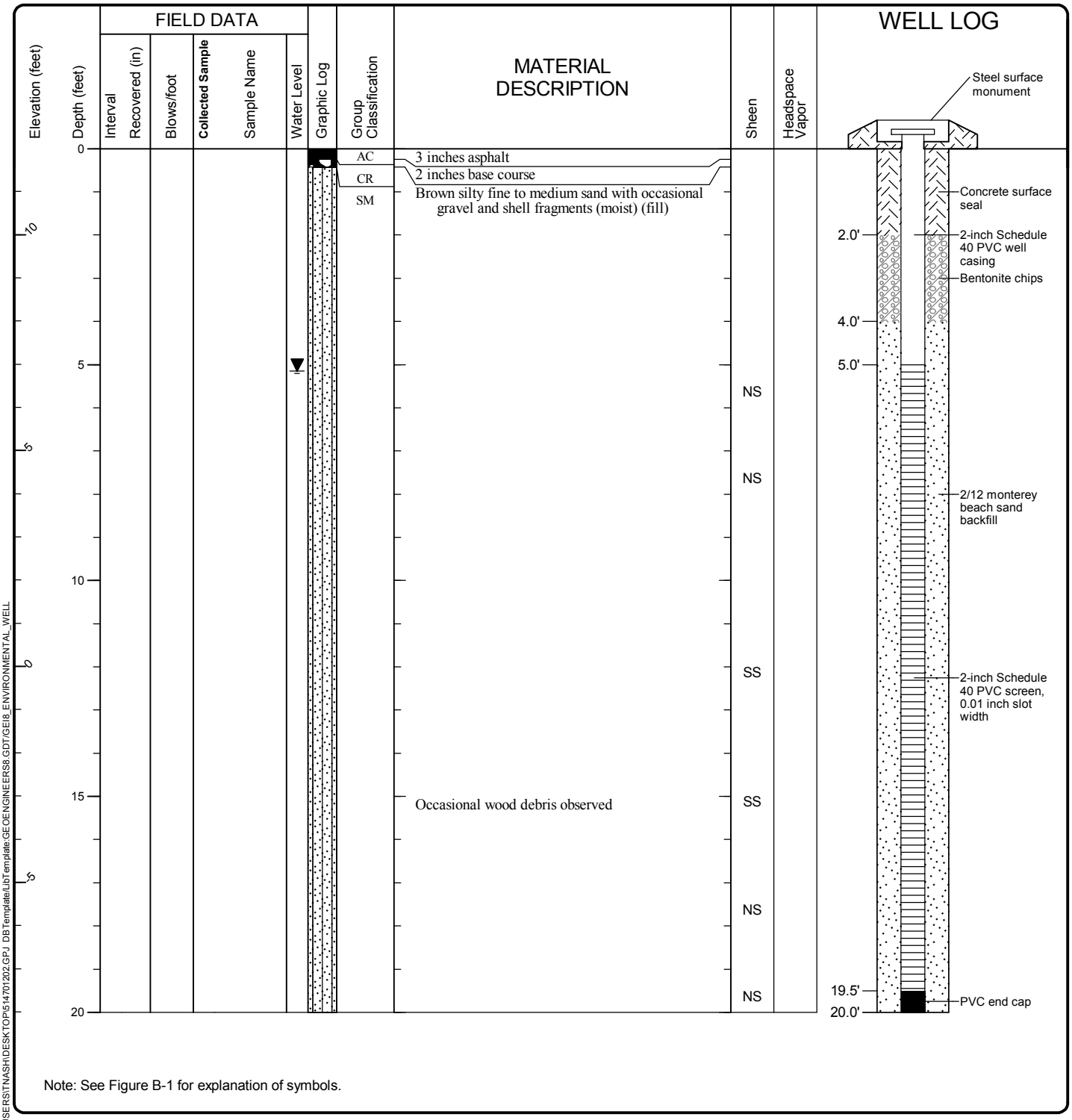
Drilled Start	End	Total Depth (ft)	Logged By / Checked By	Driller	Drilling Method
2/10/2012	2/10/2012	20	AJ / RST	Cascade Drilling, LP	Hollow Stem Auger

Hammer Data	N/A	Drilling Equipment	CME 75
Surface Elevation (ft) Vertical Datum	12.0 MLLW	Top of Casing Elevation (ft)	11.7
Easting (X) Northing (Y)	1209845.159 556436.0145	Horizontal Datum	NAD83

Licensing agency well number: **BHM147**
A 2 (in) well was installed on 2/10/2012 to a depth of 20 (ft).

Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
3/6/2012	5.2	6.50

Notes: Air knife from 0 to 5 feet. No samples obtained, soil descriptions based on drill cuttings. PID malfunction - No head space vapor readings.



Note: See Figure B-1 for explanation of symbols.

Log of Monitoring Well GEI-MW-7

GeoEngineers

Project: Former Shell Oil Tank Farm
Project Location: Anacortes, Washington
Project Number: 5147-012-02

Figure B-8
Sheet 1 of 1

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