

September 26, 2024  
File No. 04223059.00

Ms. Danielle Gibson  
Toxics Cleanup Manager  
Washington State Department of Ecology  
Southwest Regional Office  
Toxics Cleanup Program  
300 Desmond Drive  
Lacey, Washington 98503

**Subject:** Installation of Replacement Landfill Gas Probes GP-03R, GP-04R and GP-05R following Construction at WCI Vancouver Operations Center 9411 NE 94<sup>th</sup> Avenue, Vancouver, Washington

Dear Danielle,

This report, prepared by SCS Engineers (SCS) on behalf of Waste Connections Inc. (WCI), describes the installation of replacement landfill gas (LFG) probes GP-03R, GP-04R and GP-05R, located on the WCI property at 9411 NE 94<sup>th</sup> Avenue in Vancouver, Washington (Figure 1). The WCI facility is adjacent to the Closed Leichner Landfill and the gas probes (GP) are part of the landfill gas monitoring network. The work was performed consistent with the approved installation work plan and follow-up communications with the Washington Department of Ecology (Ecology).<sup>1 2</sup> The work plan was developed in coordination with Clark County Public Health (CCPH) and scheduled within the construction activities to be completed prior to building occupation.

## **DRILLING AND GAS PROBE INSTALLATION**

Gas probes GP-03R, GP-04R, and GP-05R are located in the northwest portion of the WCI facility within the new parking lot (Figure 2). The probes have been installed to monitor the potential for LFG to migrate off-site from the closed Leichner Landfill. This section describes the drilling and construction methods used to install the replacement LFG probes.

### **Drilling and Logging**

Field activities were performed in accordance with Ecology regulations. The drilling and well construction activities were performed by a Washington-licensed drilling contractor, Holt Services Inc, based in Vancouver, Washington, under the direct supervision of an SCS representative. Drilling was completed using a track mounted mobile B-58 drilling rig. The borings were drilled using an 8-inch

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<sup>1</sup> SCS Engineers, 2024. Letter Re: Work Plan for Groundwater and Landfill Gas Monitoring Probe Modifications, WCI Operations Center/Closed Leichner Landfill, Clark County, Washington, to Andrew Smith, Washington Department of Ecology, Southeast Regional Office Toxics Cleanup Program. March 12.

<sup>2</sup> Washington Department of Ecology, 2024. Email from A. Smith to B. Lary (SCS), M. Sutton (CCPH), D. Gibson (ECY) Re: WCI-Workplan for LFG probe replacements at 9411 NE 94<sup>th</sup> Avenue, Vancouver, WA. March 14.



outer diameter hollow stem auger. Lithologic descriptions were made based on drilling characteristics, materials observed on the auger flights during drilling, and lithologic logs of well and LFG probe boring previously drilled in the general vicinity of the new replacement probes. Subsurface materials included silts, sands, gravels, and mixes of the three. This site sits upon Missoula Flood Alluvium classified by Pleistocene sand, silt and gravels. The area had been recently paved, so some of the subsurface materials included gravel-fill from construction of the parking lot.

Logs for the gas probe borings showing the general lithologic units encountered during drilling are provided in Attachment 1.

## Gas Probe Design and Construction

Gas Probes GP-03R and GP-4R are located within the landscaped islands in the parking area (Figure 2), just inside the curbing and incorporated into the landscaping and irrigation system. GP-05R is located near the new maintenance building, in the area between bay doors, out of the line of traffic. Since the pavement was already installed, a portion of the asphalt was cut out using a special bit and clean tap water to core out a 12" asphalt circle. Then the boring was advanced and the gas probe installed.

Gas probes GP-03R, GP-04R and GP-05R were constructed with 1.0-inch-diameter, Schedule 40, polyvinyl chloride (PVC), flush threaded solid and slotted (screened) casing. The screened casings (0.020-inch machine-cut slots) were installed from approximately 5 to 15 feet bgs. The bottom of the screened section was fitted with a threaded flat end cap. The top of each well casing was fitted with a labcock and barbed fitting, to allow for methane readings.

The sand pack and bentonite seal materials were poured in the annular space around the PVC well casing. The 6-9 silica sand pack was placed from the bottom of the boring (1 foot below the well casing) to 1-foot above the top of the well screen. Above the sand pack, bentonite chips were poured into the annular space to within 2- feet of the surface. The gas probes were completed at the ground surface with an 8-inch, traffic-rated monument, installed flush with the pavement or the ground surface in the landscaped areas. All subsurface materials from GP-05R were collected and placed in a 55-gallon drum and WCI will manage the disposal of these soil cuttings.

Probe construction information for gas probes GP-03R, GP-04R, and GP-05R is included in the boring logs provided in Attachment 1 and summarized in Table 1.

Table 1. Landfill Gas Probe Construction Information

Probe ID	Total Depth	Screen Interval	Monument	Tag ID
GP-03R	16.8	5 – 15	Flush	BPL 292
GP-04R	16.8	5 – 15	Flush	BPL 291
GP-05R	16.9	5 – 15	Flush	BPL 293

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## Methane Monitoring



After the replacement LFG probes at GP-03R, GP-04R and GP-05R were installed, methane concentrations were measured in the probes on September 13, 2024, using a calibrated Landtec GEM 5000. All three gas probes showed 0% methane. This information will be included with the normal quarterly LFG probe monitoring results in the annual reporting for the Closed Lechner Landfill.

If you have any questions or comments regarding this letter-report, please contact Ms. Barbara Lary at (971) 284-1297 or by email at blary@scsengineers.com.

Sincerely,



Louis Caruso, LG, LHG  
Project Director/Vice President  
SCS Engineers



Barbara E. Lary, L.G.  
Senior Project Professional  
SCS Engineers

BARBARA E. LARY

cc: Derek Ranta and Yuta Naganuma, WCI  
Mike Davis and Tina Kendall, CCPH  
Alan Melnick, Joelle Loescher, J Kimberly Walker-Norton, CCPH

Encl: Figure 1 - Site Location Map  
Figure 2 - Landfill Gas Probe and Extraction Well Map  
Attachment 1 - Boring Logs  
Attachment 2 - Resource Protection Well Report Submitted to Ecology WRD

## FIGURES

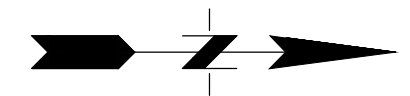


**LEGEND:**

- LB-22S ~~⊕~~ Decommissioned Monitoring Well Location
- LB-5S ⊕ Monitoring Well Location, Alluvial Water-Bearing Zone
- LB-5D ⊗ Monitoring Well Location, Troutdale Aquifer
- LB-17I □ Monitoring Well Location, Middle of Alluvial Water-Bearing Zone
- LB-9SR ~~⊕~~ Well in gray (former location decommissioned)
- Property Boundary
- - - - - Limit of Landfill Cover and Approximate Edge of Waste
- Proposed Site Developments
- █ Proposed Site Asphalt Area

**NOTES:**

1. Topography taken from Clark County GIS, December 2023.



**SCS ENGINEERS**  
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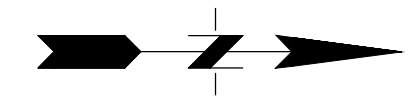
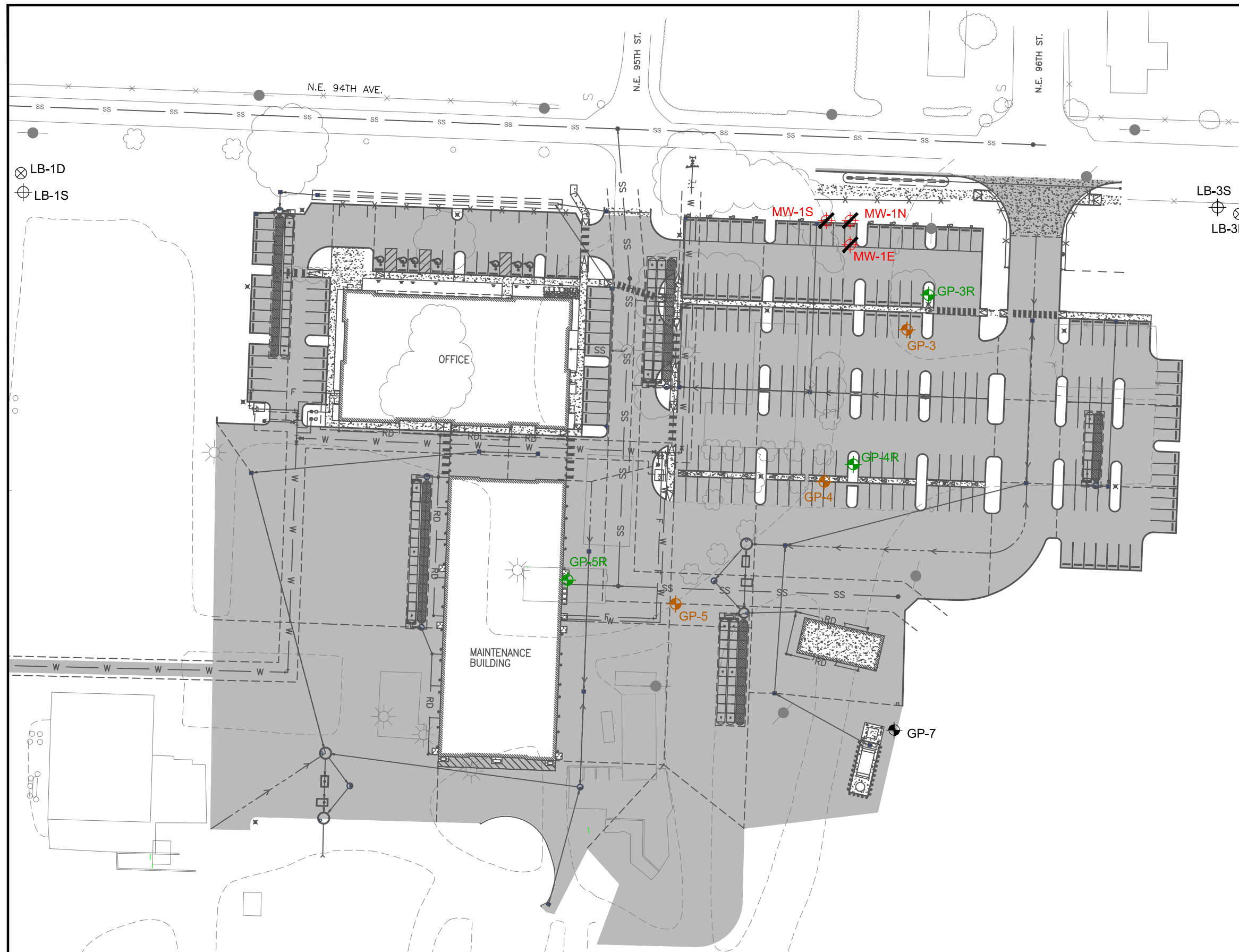


PROJECT NO.	04223059.00	DES BY	B.L.
SCALE	AS SHOWN	CHK BY	B.L.
CAD FILE	FIGURE 2	APP BY	L.C.

**GROUNDWATER MONITORING WELL LOCATIONS**  
 WASTE CONNECTION INC. PROPERTY  
 VANCOUVER, WASHINGTON

DATE MARCH 2024  
 FIGURE 1

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 DWG TO PDF.plt



**LEGEND:**

- + GP-4R New Compliance Landfill Gas Monitoring Probe Location
- + GP-5 Decommissioned Landfill Gas Monitoring Probe Location
- + GP-7 Landfill Gas Monitoring Probe Location
- / MW-1S Decommissioned Monitoring Well Location
- + LB-3S Monitoring Well Location, Alluvial Water-Bearing Zone
- + LB-3D Monitoring Well Location, Troutdale Aquifer
- Proposed Site Developments
- Proposed Site Asphalt Area

**NOTE:**

Topography taken from Clark County GIS, December 2023.

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PROJECT NO.	04223059.00	DES BY	B.L.
SCALE	AS SHOWN	CHK BY	B.L.
CAD FILE	FIGURE 1	APP BY	L.C.

**LANDFILL GAS PROBE LOCATIONS**  
 WASTE CONNECTION INC. PROPERTY  
 VANCOUVER, WASHINGTON

DATE MARCH 2024  
 FIGURE 2

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# **ATTACHMENT 1**

## **Boring Logs**

14945 SW Sequoia Parkway, Suite 180  
Portland, OR 97224

**BORING NUMBER: GP-03R**

Page 1 of 1

**WCI. Gas Probe Installation 2024**  
**9411 NE 94th St**  
**Vancouver, WA 98662**

**JOB NUMBER: 04223059.00**

REMARKS: Well Tag ID: BPL-292

Depth		Graphical Log	Description	Comments	Completion Detail
meters	feet				
0	0		SILTY SAND with some GRAVEL (SP), brown, loose, dry.		
1	5		SAND with SILT and GRAVEL (GM), brown, loose, dry.		
2	10		SILTY SAND (SM), brown, loose, dry.		
3	15		SILTY SAND (SM), brown, loose, dry.	Encountered some GRAVEL.	
4	16.8		End of Boring at 16.8 feet. Installed LFG Probe.		
5	20				

LB\_LFG\_WELL\_LOG WCI\_GP3R\_4R\_5R.GPJ SCS\_LFG.GDT 9/16/24

Drilling Company: **Holt**  
 Drilling Method: **Hollow Stem Auger**  
 Logged By: **S. Campbell**  
 Sampling Method: **No Sampling**

Date Started: **8/26/24**  
 Date Ended: **8/26/24**  
 Boring Diameter: **8"**  
 Well Diameter: **1"**  
 Total Depth: **16.8 ft.**



14945 SW Sequoia Parkway, Suite 180  
Portland, OR 97224

**BORING NUMBER: GP-04R**

Page 1 of 1

**WCI. Gas Probe Installation 2024**  
**9411 NE 94th St**  
**Vancouver, WA 98662**

**JOB NUMBER: 04223059.00**

REMARKS: Well Tag ID: BPL-291

Depth	Graphical Log	Description	Comments	Completion Detail
0 0		SILTY SANDY GRAVEL (GM), brown, loose, moist. FILL.		<p>Flush-Mount, Traffic-Rated Well Box 1/4" Labcock Valve I.D. Tag Concrete Bentonite chips (1.5 x 50# bag, hydrated) 1-inch diameter PVC casing 6 X 9 Silica Sand (7.25 x 50# bags) 1-inch diameter, SCH 40 PVC slotted (0.020-inch) screen Threaded, flat PVC end cap</p>
5 5		SILTY SAND (SM), brown, loose, dry to moist.		
16.8 16.8		End of Boring at 16.8 feet. Installed LFG Probe.		
20 20				

LB\_LFG\_WELL\_LOG WCI\_GP3R\_4R\_5R.GPJ SCS\_LFG.GDT 9/16/24

Drilling Company: **Holt**  
Drilling Method: **Hollow Stem Auger**  
Logged By: **S. Campbell**  
Sampling Method: **No Sampling**

Date Started: **8/26/24**  
Date Ended: **8/26/24**  
Boring Diameter: **8"**  
Well Diameter: **1"**  
Total Depth: **16.8 ft.**

14945 SW Sequoia Parkway, Suite 180  
Portland, OR 97224

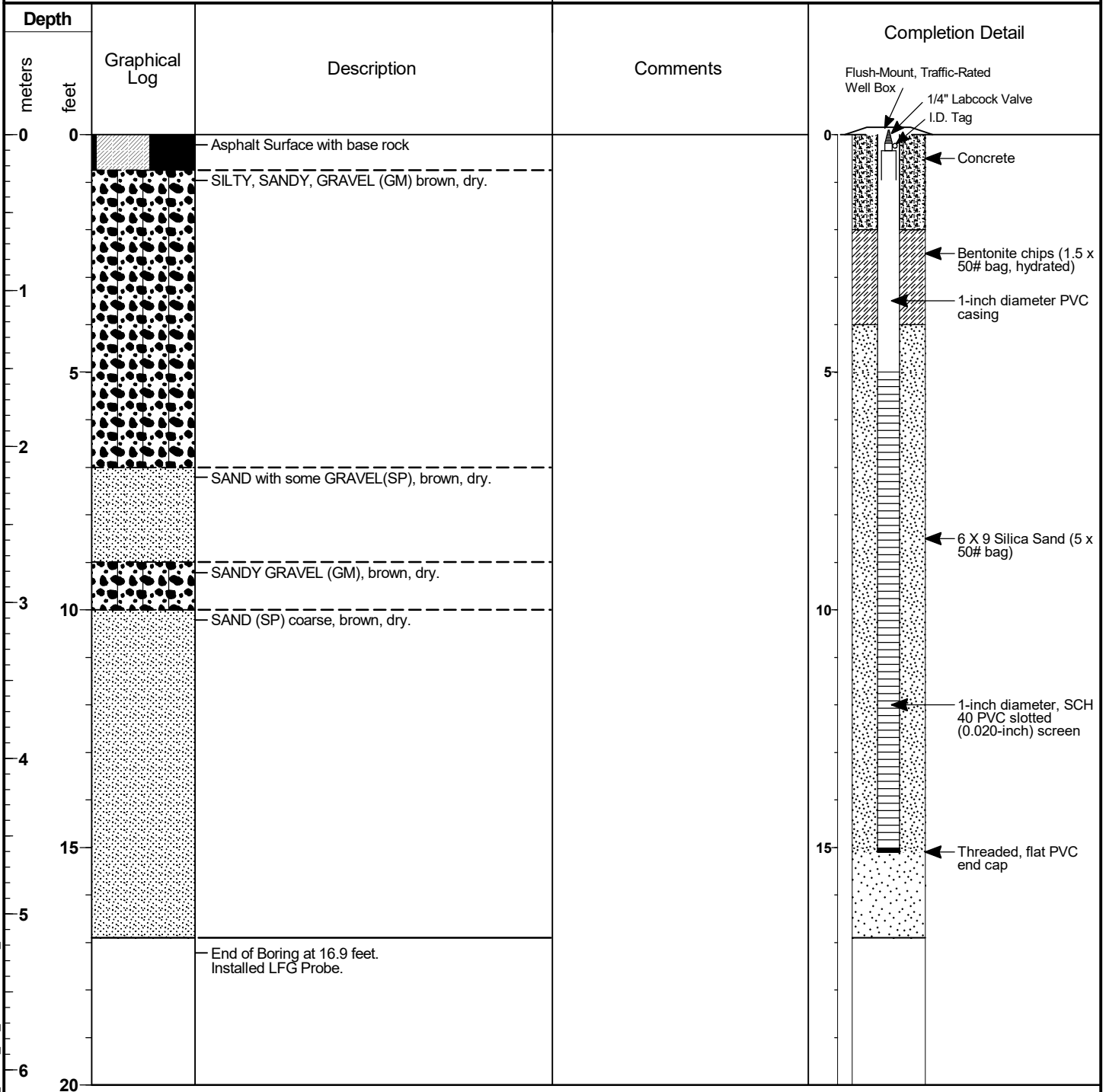
**BORING NUMBER: GP-05R**

Page 1 of 1

**WCI. Gas Probe Installation 2024**  
**9411 NE 94th St**  
**Vancouver, WA 98662**

**JOB NUMBER: 04223059.00**

REMARKS: Well Tag ID: BPL-293



LB\_LFG\_WELL\_LOG WCI\_GP3R\_4R\_5R.GPJ SCS\_LFG.GDT 9/16/24

Drilling Company: **Holt**  
 Drilling Method: **Hollow Stem Auger**  
 Logged By: **S. Campbell**  
 Sampling Method: **No Sampling**

Date Started: **8/26/24**  
 Date Ended: **8/26/24**  
 Boring Diameter: **8"**  
 Well Diameter: **1"**  
 Total Depth: **16.9 ft.**

## **ATTACHMENT 2**

**Resource Protection Well Report Submitted to Ecology WRD**

# Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

Type of Work:

- Construction
- Decommission  $\Rightarrow$  Original NOI No. \_\_\_\_\_

Ecology Well ID Tag No. BPL-291

Site Well Name GR-03R

Consulting Firm SCS

Was a variance approved for this well/boring?  Yes  No

If yes, what was the variance for? \_\_\_\_\_

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

Driller  Trainee  Engineer

Name (Print Last, First Name) SMITH DAN

Driller/Engineer/Trainee Signature [Signature]

License No. 2984

Company Name HOLT

If trainee box is checked, sponsor's license number: \_\_\_\_\_

Sponsor's signature \_\_\_\_\_

Notice of Intent No. REJ6640

Type of Well:

- Resource Protection Well  Injection Point
- Remediation Well  Grounding Well
- Geotechnical Soil Boring  Ground Source Heat Pump
- Environmental Boring  Other

$\hookrightarrow$   Soil-  Vapor-  Water-sampling

Property Owner WCI

Well Street Address 9411 NE 94th

City Vancouver County CLARK

Tax Parcel No. 199859000

Location (see instructions): WWM  or EWM

NW 1/4-2 NW 1/4, Section 4 Town 2N Range 2E

Latitude (Example: 47.12345) 45.6910361

Longitude (Example: -120.12345) 122.5753500

(WGS 84 Coordinate System)

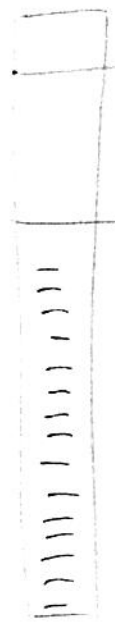
Borehole diameter 8 inches Casing diameter \_\_\_\_\_ inches

Static water level \_\_\_\_\_ ft below top of casing Date \_\_\_\_\_

Above-ground completion with bollards  Flush monument

$\hookrightarrow$  Stick-up of top of well casing \_\_\_\_\_ ft above ground surface

Start Date 8/26/24 Completed Date 8/26/24

Construction Design	Well Data	Driller's Log
	<p>WELL BOT &amp; CONCRETE 0-2</p> <p>CHIPS 2' 4"</p> <p>SAND 4-15</p> <p>SCREEN 5-15'</p> <p>1" PVC CASING 0-5'</p> <p>1" PVC SCREEN 5-15'</p>	<p>0-5' FILL</p> <p>5'-15'</p> <p>SILTY GRAVELS</p>

### Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

**Type of Work:**

- Construction
- Decommission  $\Rightarrow$  Original NOI No. \_\_\_\_\_

Ecology Well ID Tag No. BPL-292

Site Well Name GP-04R

Consulting Firm SCS

Was a variance approved for this well/boring?  Yes  No

If yes, what was the variance for? \_\_\_\_\_

Notice of Intent No. RE2664L

**Type of Well:**

- Resource Protection Well
  - Remediation Well
  - Geotechnical Soil Boring
  - Environmental Boring
  - Injection Point
  - Grounding Well
  - Ground Source Heat Pump
  - Other
- $\hookrightarrow$   Soil-  Vapor-  Water-sampling

Property Owner WCI

Well Street Address 9411 NE 94th

City Vancouver County CLARK

Tax Parcel No. 199859000

Location (see instructions): WWM  or EWM

NW 1/4 NW 1/4, Section 4 Town 2N Range 28

Latitude (Example: 47.12345) 45.6909314

Longitude (Example: -120.12345) 122.5748753

(WGS 84 Coordinate System)

Borehole diameter 0 inches Casing diameter \_\_\_\_\_ inches

Static water level \_\_\_\_\_ ft below top of casing Date \_\_\_\_\_

Above-ground completion with bollards  Flush monument

$\hookrightarrow$  Stick-up of top of well casing \_\_\_\_\_ ft above ground surface

Start Date 8/26/24 Completed Date 8/26/24

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

Driller  Trainee  Engineer

Name (Print Last, First Name) Simon Paul

Driller/Engineer/Trainee Signature [Signature]

License No. 2984

Company Name WCI

If trainee box is checked, sponsor's license number: \_\_\_\_\_

Sponsor's signature \_\_\_\_\_

Construction Design	Well Data	Driller's Log
	<p>WELL BOX IS CONCRETE                  0-2'                  CHIPS 2-4'                    SAND 4-15                  SCREEN 5-5                    1" PVC CASING                  0-5'                  1" PVC SCREEN                  5'-15'</p>	<p>NO SAMPLES TAKEN                    Fill 0-5'                  S. 1/4                  GRAVEL 5'-15'</p>

### Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

Type of Work:

- Construction
- Decommission  $\Rightarrow$  Original NOI No. \_\_\_\_\_

Ecology Well ID Tag No. BPL-293

Site Well Name GP-USE

Consulting Firm SCS

Was a variance approved for this well/boring?  Yes  No

If yes, what was the variance for? \_\_\_\_\_

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

Driller  Trainee  Engineer  
 Name (Print Last, First Name) Sydney Pave  
 Driller/Engineer/Trainee Signature [Signature]  
 License No. 2984  
 Company Name HOLT

If trainee box is checked, sponsor's license number: \_\_\_\_\_  
 Sponsor's signature \_\_\_\_\_

Notice of Intent No. RE26642

Type of Well:

- Resource Protection Well  Injection Point
- Remediation Well  Grounding Well
- Geotechnical Soil Boring  Ground Source Heat Pump
- Environmental Boring  Other \_\_\_\_\_
- Soil  Vapor  Water-sampling

Property Owner WCI

Well Street Address 9411 NE 94th

City Vancouver County CLARK

Tax Parcel No. 199859000

Location (see instructions): WWM  or EWM

NW 1/4 NW 1/4, Section 4 Town 2N Range 2E

Latitude (Example: 47.12345) 45.6903761

Longitude (Example: -120.12345) 122.5744364

(WGS 84 Coordinate System)

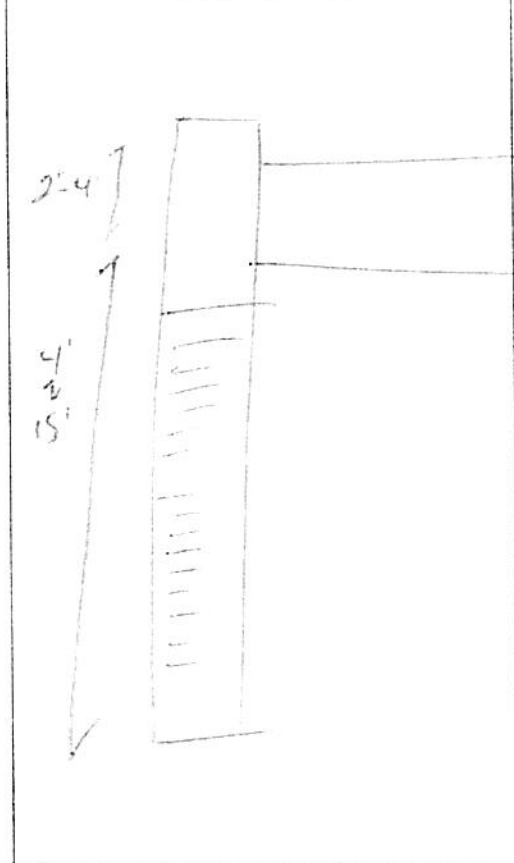
Borehole diameter 8" inches Casing diameter \_\_\_\_\_ inches

Static water level \_\_\_\_\_ ft below top of casing Date \_\_\_\_\_

Above-ground completion with bollards  Flush monument

$\hookrightarrow$  Stick-up of top of well casing \_\_\_\_\_ ft above ground surface

Start Date 5/26/24 Completed Date 5/26/24

Construction Design	Well Data	Driller's Log
	<p>WELL BOT FROM                  0-2' CONCRETE</p> <p>CHIPS FROM                  2' TO 4'</p> <p>SAND FROM                  4' TO 10'</p> <p>SCREEN 5'-15'</p> <p>1" PVC                  CASING                  0-5'</p> <p>1" PVC                  SCREEN                  5'-15'</p>	<p>FILL 0-5'</p> <p>SILT                  GRAVE 5'-15'</p>