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Company:	Washington Department of Ecology	Date:	July 8, 2020
Address:	300 Desmond Drive SE Lacey, WA 98503		
cc:	Ramsey Zawideh, Golden Corral (via email only) Bassel Ayoub (via email only)		
GDI Project:	GCVan-1-01		
RE:	Second Quarter 2020 Methane Monitoring Results Golden Corral 11801 NE Fourth Plain Boulevard Vancouver, Washington Cleanup Site Identification No.: 4677		

INTRODUCTION

On behalf of Golden Corral, GeoDesign, Inc. is pleased to provide this technical memorandum summarizing the results of the second quarter 2020 methane monitoring event at the Golden Corral restaurant located at 11801 NE Fourth Plain Boulevard in Vancouver, Washington (project site). GeoDesign performed the methane monitoring on June 25, 2020. Results from the second quarter 2020 methane monitoring event are presented below.

BACKGROUND

The project site is a former landfill and a listed cleanup site in the Washington State Department of Ecology (Ecology) cleanup site database. In 2000 Ecology determined the project site was eligible for a No Further Action determination, which included institutional controls in the form of a restrictive covenant. In general, the restrictive covenant prohibits the use of groundwater at the project site and requires approval from Ecology and local agencies with jurisdiction for all redevelopment plans on the property. The west portion of the former landfill was redeveloped with the construction of a Golden Corral restaurant. Under Ecology oversight, the redevelopment included a methane mitigation system consisting of the following elements:

- A sub-slab passive venting system
- A low permeable membrane installed underneath the floor slab
- Trench dams to prevent methane migration along utility trenches
- Conduit plugs and seals to prevent methane migration into the structure through utility conduits

In 2017 the methane mitigation system was installed in general accordance with the engineering design documents. With the completion of construction in 2018, Ecology has requested quarterly monitoring to evaluate the protectiveness of the methane mitigation system.

FIELD ACTIVITIES

GeoDesign conducted the second quarter 2020 methane monitoring event at the project site on June 25, 2020. During the quarterly monitoring, GeoDesign incorporated recommendations provided by Ecology in an email dated April 6, 2020. For each sub-slab probe, GeoDesign used the following sampling methodology:

- Purge at least one casing volume
- Collect a set of gas measurements
- Continue to purge the sub-slab probe and collect gas measurements at approximately 0.5 casing volumes until the difference between successive measurements is less than 10 percent.

Using a Landtec GEM 2000+ gas analyzer and a GAST diaphragm pump, GeoDesign monitored the three sub-slab monitoring probes (SSP-1 through SSP-3). Additionally, the Landtec GEM 2000+ gas analyzer was used to monitor the three vent risers (VR-1, VR-2, and VR-4). For each monitoring point, the percent by volume of methane, oxygen, and carbon dioxide was measured and recorded. Lastly, the date, time, atmospheric barometric pressure, and static pressures (sub-slab probes only) were recorded during the monitoring event.

METHANE MONITORING RESULTS

Methane monitoring results are summarized on Table 1. The sub-slab monitoring field form is presented in the Attachment. After approximately two casing volumes were purged, methane was not detected in sub-slab monitoring probes SSP-1, SSP-2, and SSP-3 and vent risers VR-1, VR-2, and VR-4. Additionally, measurable static pressure was not observed in the sub-slab monitoring probes. As noted in the construction completion report, vent riser VR-3 was combined with vent riser VR-4 and the vent pipe through the roof was designated VR-4.¹

DISCUSSION OF METHANE MONITORING RESULTS

Results from the second quarter 2020 methane monitoring event indicated methane is not accumulating under the slab and static pressures under the slab remain consistently at or near zero. The data indicate that methane mitigation system is functioning as intended by allowing methane to vent from underneath the structure.

During the first quarter 2020, methane concentrations measured in VR-4 were greater than the lower explosive limit (LEL). At the request of Ecology, GeoDesign conducted supplemental monitoring approximately one month after the first quarter 2020 monitoring. Results from the supplemental

¹ GeoDesign, Inc., 2019. *Construction Completion Report; Proposed Development - Former Turnbull Landfill; Southeast of SR 500 and NE Fourth Plain Boulevard; Vancouver, Washington*, dated July 3, 2019. GeoDesign Project: Orchard-1-01

monitoring indicated methane concentrations decreased to less than the LEL but still greater than previous monitoring events. Except for the first quarter 2020 monitoring event, monitoring data indicate that methane concentrations are generally stable and are not accumulating under the structure. Based on this, GeoDesign respectfully requests concurrence from Ecology to reduce the monitoring frequency from quarterly to semi-annually.

SUMMARY

During the second quarter 2020 methane monitoring event, methane was not detected in the sub-slab monitoring probes or vent risers. Additionally, static pressure was not observed in the sub-slab monitoring probes. The second quarter monitoring results indicate that methane is not accumulating beneath the building and the methane mitigation system is performing as intended. Pending concurrence from Ecology, the next monitoring event is scheduled for December 2020.

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We appreciate Ecology's continued support on this project. Please call if you have questions concerning the information provided.

SRV:MFC:JSO:sn

Attachments

One copy submitted (via email only)

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Signed 07/08/2020

TABLES

TABLE 1
Summary of Quarterly Methane Monitoring Results
Golden Corral
Vancouver, Washington

Location I.D.	Date	Barometric Pressure (mbars)	Pressure (inches water)	Concentration (pbv)			Comments
				Methane	Carbon Dioxide	Oxygen	
Sub-Slab Probes							
SSP-1	08/27/19	1,013	NM	0.0	0.0	19.8	Q3, 2019 monitoring event
SSP-2	08/27/19	1,013	NM	0.0	0.0	20.0	Q3, 2019 monitoring event
SSP-3	08/27/19	1,013	NM	0.0	0.0	20.1	Q3, 2019 monitoring event
SSP-1	12/12/19	1,008	0.0	0.0	0.0	20.5	Q4, 2019 monitoring event
SSP-2	12/12/19	1,008	0.0	0.0	0.1	20.4	Q4, 2019 monitoring event
SSP-3	12/12/19	1,008	0.0	0.0	0.1	20.4	Q4, 2019 monitoring event
SSP-1	02/28/20	1,012	0.0	0.0	0.0	20.9	Q1, 2020 monitoring event
SSP-2	02/28/20	1,012	0.0	0.0	0.1	20.8	Q1, 2020 monitoring event
SSP-3	02/28/20	1,012	0.0	0.0	0.0	20.7	Q1, 2020 monitoring event
SSP-1	03/26/20	1,013	-0.01	0.0	0.0	21.1	Q1, 2020 supplemental monitoring event
SSP-2	03/26/20	1,013	0.0	0.0	0.0	21.0	Q1, 2020 supplemental monitoring event
SSP-3	03/26/20	1,013	0.0	0.0	0.0	20.9	Q1, 2020 supplemental monitoring event
SSP-1	06/25/20	1,010	0.0	0.0	0.0	21.2	Q2, 2020 monitoring event
SSP-2	06/25/20	1,010	0.0	0.0	0.0	21.1	Q2, 2020 monitoring event
SSP-3	06/25/20	1,010	0.0	0.0	0.0	21.1	Q2, 2020 monitoring event
Vent Risers							
VR-1	08/27/19	1,013	--	0.1	0.0	20.4	Q3, 2019 monitoring event
VR-2	08/27/19	1,013	--	0.1	0.0	20.3	Q3, 2019 monitoring event
VR-4	08/27/19	1,013	--	0.1	7.1	10.4	Q3, 2019 monitoring event
VR-1	12/12/19	1,008	--	0.0	0.1	20.3	Q4, 2019 monitoring event
VR-2	12/12/19	1,008	--	0.0	0.1	20.3	Q4, 2019 monitoring event
VR-4	12/12/19	1,008	--	0.0	0.1	79.7	Q4, 2019 monitoring event
VR-1	02/28/20	1,012	--	0.0	0.1	21.0	Q1, 2020 monitoring event
VR-2	02/28/20	1,012	--	0.5	7.3	13.3	Q1, 2020 monitoring event

TABLE 1
Summary of Quarterly Methane Monitoring Results
Golden Corral
Vancouver, Washington

Location I.D.	Date	Barometric Pressure (mbars)	Pressure (inches water)	Concentration (pbv)			Comments
				Methane	Carbon Dioxide	Oxygen	
VR-4	02/28/20	1,012	--	6.8	16.6	1.8	Q1, 2020 monitoring event
VR-1	03/26/20	1,013	--	0.0	0.1	20.7	Q1, 2020 supplemental monitoring event
VR-2	03/26/20	1,013	--	0.0	6.5	14.1	Q1, 2020 supplemental monitoring event
VR-4	03/26/20	1,013	--	1.2	6.9	12.8	Q1, 2020 supplemental monitoring event
VR-1	06/25/20	1,010	--	0.0	0.1	21.0	Q2, 2020 monitoring event
VR-2	06/25/20	1,010	--	0.0	3.8	16.8	Q2, 2020 monitoring event
VR-4	06/25/20	1,010	--	0.0	5.3	13.7	Q2, 2020 monitoring event

Notes:

--: Pressure was not measured because vent risers are open to the atmosphere.

I.D.: identification

mbars: millibars

NM: Static pressure not measured during this monitoring event.

pbv: percent by volume

ATTACHMENT

