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March 31, 2017
Project No. RD5911

craig.suchy@wspgroup.com
Original will remain on file

WSP Canada Inc.
7710 Edgar Industrial Court
Red Deer, Alberta
T4P 4E2

ATTN: Craig Suchy, P.Eng.

Re: Geotechnical Investigation – Addendum #1
Proposed Nursery Golf Course RV Development
Portion of SW 7-41-26-W4M, Lacombe County, Alberta

Dear Mr. Suchy:

The Nursery Golf and Country Club Inc. (NGCC) is proposing new RV site in Lacombe County, Alberta. Parkland Geotechnical Consulting Ltd. (ParklandGEO) was commissioned by WSP Canada Inc. (WSP) to conduct a geotechnical assessment for the development. ParklandGEO previously submitted a geotechnical report for the proposed development;

- *"Geotechnical Investigation – Proposed Nursery Golf Course RV Development – Portion of SW 7-41-26-W4M, Lacombe County, Alberta.",* prepared for WSP Canada Inc., by Parkland Geotechnical Consulting Ltd., dated March 2016 (File # RD5911).

Subsequent to the release of the above mentioned report, WSP has requested preliminary suitability of private sewage system for the site. It is understood that an existing private sewage system is located at southeast of the development. It is understood that expansion of the existing private sewage treatment system (PSTS) was considered in the development. This letter addendum has been prepared to provide an overview of suitability for PSTS based on the soil encountered in the boreholes for the proposed development.

1.0 PRIVATE SEWAGE TREATMENT SYSTEM

The following comments are intended to provide an overview of PSTS suitability for the general area, and soil design parameters for preliminary sizing only. A detailed assessment for each individual PSDS is not within the scope of this assessment.

1.1 SITE DESCRIPTION

The property area has gentle rolling topography elevated in the west and sloped to the east. The proposed development will have slopes of less than 10 percent in the general area proposed for PSTS at the site. Rock outcrops were not observed within the vicinity of the site. A water detention pond is located 100 m east of development area. No other natural features were identified that could impact the application and/or design of a treatment system. Clearing of trees and vegetation may be required for the installation of on-site wastewater treatment systems.

1.2 SITE CLASSIFICATION

To make effective use of the Standard, the description of the soil must use terms that are set out in the Canadian System of Soil Classification as effluent loading rates and available vertical separations is determined by these characteristics. The soils encountered were categorized by the Safety Codes Council (SCC) soil texture classification system, in accordance with the standard. The SCC soil texture classification system is summarized on the attached Soil Triangle. The following table summarizes the classification of the site soils based on the laboratory testing.

TABLE 1
SOIL CLASSIFCATION FOR PSDS

Sample ID	Depth (m)	Sand Content (% by wt.)	Clay Content (% by wt.)	SSC Soil Texture Classification	Structure Shape*	Structure Grade*
1D1	1.5	3.8	78.8	Heavy Clay (HC)	Massive (M)	Weak (1) to Moderate (2)
2D1	3.0	7.8	67.9	Heavy Clay (HC)	Massive (M)	Weak (1) to Moderate (2)

*The structure of the soil is assumed and should be verified prior to construction of the PSDS.

Additional testing will be required once the proposed PSDS sites.

1.3 SOIL SUITABILITY

As discussed in the Section 3.0 of the geotechnical report, six boreholes were drilled at the site to depths from 6 to 6.5 m below grade. The subsoil profile for the majority of the site consisted of Heavy Clay with an assumed massive, weak to moderate structure. These silty clay soil deposits having massive structure are not generally considered suitable for treatment fields. A treatment mound will likely be required for economic Material for mounds would need to be imported to site.

1.4 PRELIMINARY PSDS REQUIREMENTS

Any soil-based treatment requires a minimum vertical separation of 0.9 m between the groundwater table and any limiting soils conditions and the point at which the effluent infiltrates into the soil. The Standard of Practices sets an effluent loading rate of 19.6 L/day/m^2 when using soil-based treatment in fine sand and 8.8 L/day/m^2 in fine sand loam, with a specified effluent quality of 30 – 150 mg/L. Silty Clay soils of massive and strong structure is considered a limiting layer and therefore is set an effluent rate of 0.0 L/day/m^2. For a more detailed outline of all the effluent loading rates and separation distances required by each of the treatment systems mentioned in this report, please refer to the Alberta Private Sewage System Standards of Practice.

Additional requirements for private sewage disposal systems:

1. Septic tanks need to have adequate earth cover or other means to protect it from freezing while in operation and during periods of non-use. A septic tank that has less than 1.2 m of earth cover to protect it from freezing conditions need to be insulated to provide the equivalent of an R-8 insulation value over the top and sides of the tank to a minimum depth of 1.2 m below grade or insulated in some other acceptable manner to achieve a level of protection from freezing that equivalent to tank that has a minimum 1.2 m cover of the in situ soil.

2. The PSDS shall be designed to meet the separation requirements and to not exceed the effluent loading rate. The treatment system should be constructed in accordance with applicable regulations and should be properly sized and installed by a licensed contractor based on normal testing and verification of actual field conditions.

1.5 TREATMENT MOUND

For the proposed PSDS areas investigated, a septic tank and conventional treatment field system were not suitable for private sewage disposal due to limiting conditions imposed by the soil conditions. A more feasible option would be a treatment mound receiving secondary treated effluent. Mounds will need to be constructed with imported materials that meet the required infiltration rate requirements. In addition, treatment mounds are required to meet the following setback requirements:

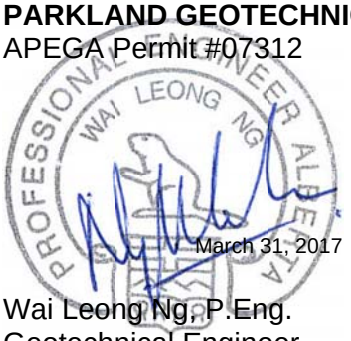
- 15 from a water source;
- 15 m from a water course;
- 3 m from a property line;
- 3 m from septic tank;
- 10 m from a building without a basement, cellar or crawl space; and
- 10 m from a basement, cellar or crawl space.

Additional details and recommendations can be provided when the detail PSDS assessment is undertaken.

3.0 CLOSURE

The recommendations provided above are based on available file information, and should be used together with ParklandGEO's geotechnical report (File #RD5911). This addendum has been prepared for the exclusive use of **Nursery Golf and Country Club Inc**., **WSP Canada Inc.**, and their approved agents for the specified application to Proposed Nursery Golf Course RV Development, in Lacombe County, Alberta. This letter has been prepared in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made. We trust that the comments and recommendations provided above meet with your present requirements. If you have any questions or comments, please do not hesitate to contact our office.

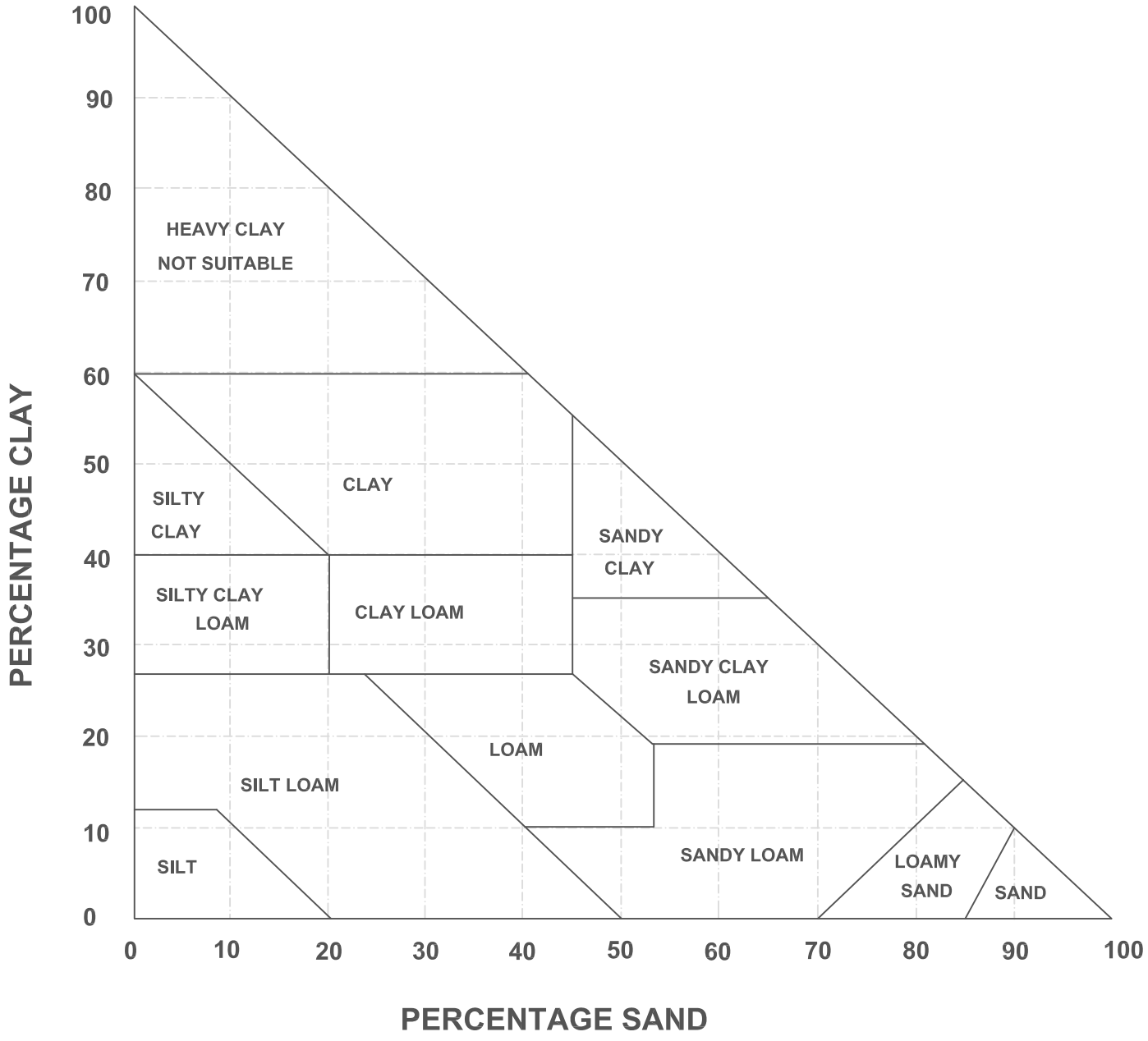
Respectfully submitted,
PARKLAND GEOTECHNICAL CONSULTING LTD.
APEGA Permit #07312



Wai Leong Ng, P.Eng.
Geotechnical Engineer

Reviewed by:
Mark Brotherton, P.Eng.

Attach/ Figure 5: Soil Texture Classification



Parkland GEO	CLIENT: WSP	**SOIL TEXTURE CLASSIFICATION**	
		PROPOSED NURSERY GOLF COURSE RV DEVELOPMENT PORTION OF SW 7-41-26 W4M, LACOMBE COUNTY, AB	
		DRAWN: NN / CHK'D.: MDB / REV #: 0	DATE: MARCH 2017
		SCALE: NTS / JOB NO. RD5911	DRAWING NO. FIGURE 5