California
Department of Conservation
California Geological Survey

Gavin Newsom, Governor
David Shabazian, Director

January 12, 2021

Mr. Ron Dragoo
City Engineer
Public Works Department
City of Rancho Palos Verdes
30940 Hawthorne Boulevard
Rancho Palos Verdes, CA 90275-5391

Subject: **Comments on the scope and content of the NOP for the Portuguese Bend Landslide Mitigation Project, City of Rancho Palos Verdes, California SCH# 2020110212**

Dear Mr. Dragoo:

The California Geological Survey (CGS) received a Notice of Preparation (NOP) of an Environmental Impact Report (EIR) for the Portuguese Bend Landslide Mitigation Project (PBLMP) in the City of Rancho Palos Verdes, California. This letter conveys suggestions and recommendations from CGS concerning the geologic and seismic issues for the PBLMP from our review of the NOP and the project summary report prepared by Chambers Group, Inc., dated November 2020.

CGS recommends the EIR address the following items and issues relating to the PBLMP project:

1) Regional and Site-Specific Geology

The Chambers report does not provide a discussion of the regional or site-specific geology, nor does it discuss how the geology influences the landslide hazard identified at this site. The EIR should include a discussion of the geology and geologic structure underlying the PBLMP, including a description of rock types and a thorough characterization of the Portuguese Bend Landslide Complex. This characterization should include an accurate determination of the landslide limits and failure surface geometry, identification of the rupture surface, and strength of the basal failure material and internal landslide mass. With respect to groundwater, the EIR should discuss current levels, historic fluctuations, and sources of surface water infiltration and subsurface recharge. Additionally, the EIR should include geologic cross sections depicting the geology, bedrock structure, landslide geometry, groundwater level(s), failure plane(s), surface fractures, and proposed hydrauger locations and depths. Lastly, the Chambers report states the hydraugers will be installed beneath "the active movement zone of the landslide." Therefore, the EIR should discuss how the "active movement zone" is defined.

At a minimum, the following geologic maps and reports should be considered:

Dibblee, T.W., Ehrenspeck, H.E., Ehlig, P.L., and Bartlett, W.L., 1999, Geologic map of the Palos Verdes Peninsula and vicinity, Redondo Beach, Torrance, and San Pedro quadrangles, Los Angeles County, California: Dibblee Geological Foundation, Dibblee Foundation Map DF-70, scale 1:24,000.

Haydon, W.D., 2007, Landslide Inventory Map of the Palos Verde Peninsula, Los Angeles County, California: California Geological Survey, scale 1:24,000.

Vonder Linden, K., 1989, "The Portuguese Bend Landslide", Engineering Geology, Volume 27, Issues 1–4, Pages 301-373.

Woodring, W.P., Bramlette, M.N., and Kew, W.S.W., 1946, Geology and paleontology of Palos Verdes Hills, California: U.S. Geological Survey, Professional Paper 207, scale 1:24,000.

2) Geologic and Seismic Hazards
Numerous potential geologic hazards exist within the PBLMP project area. Each of the hazards listed below should be addressed in the EIR.

   a. *Landslide Hazards*
   Gravitational landsliding is obviously identified at this site; however, the project is located in a Zone of Required Investigation for "earthquake-induced landslides" established by CGS. This additional landslide triggering mechanism should be discussed in the EIR with respect to the effectiveness of the proposed mitigation measures. At a minimum, the following reports should be reviewed for this specific evaluation:

   California Geological Survey, 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California, CGS Special Publication 117A, 81 p.

   Blake, T.F., 2002, Recommended Procedures for Implementation of DMG Special Publication 117 Guidelines for Evaluating and Mitigating Seismic Hazards in California, Southern California Earthquake Center, 132 p.

   b. *Ground Shaking Hazards*
   The Chambers report states there is "No Impact" from strong seismic ground shaking because no structures are planned. While no new structures are planned for the PBLMP, earthquake shaking is still a concern as a driving force that can trigger landslides, which are otherwise stable under static conditions. The EIR should discuss the ground motion hazard analysis used to derive appropriate seismic input parameters for dynamic (i.e., pseudostatic) slope stability analysis.

3) Mitigation Effectiveness
The PBLMP involves a proposed three-phased approach with a stated goal to "control the existing landslide area." The anticipated phases are (in order): surface fracture in-filling, surface water improvements, and groundwater mitigation improvements. While CGS cannot comment of the adequacy of these mitigation measures, the EIR should discuss how the effectiveness of this mitigation design will be determined and how the mitigation efficacy will be verified after construction.

Please let me know if you have any questions or concerns with the comments in this letter.

Sincerely,

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