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 Coastal Planner  
 North Central Coast District  
 California Coastal Commission  
 45 Fremont Street – Suite 2000  
 San Francisco, CA 94105-2219

November 1, 2016

RE: Coastal Development Permit #2-15-1357  
 Special Condition #2 Annual Report, November 1, 2016

Dear Shannon,

On November 5, 2015, the California Coastal Commission (CCC) approved Coastal Development Permit (CDP) #2-15-1357 for the San Francisco Public Utilities Commission’s (SFPUC) South Ocean Beach Short Term Coastal Erosion Protection Measures project. The CDP authorized the SFPUC to carry out as-needed, short-term protection measures at South Ocean Beach (SOB) for six years (2015-2021). These measures were permitted to protect the coast to the extent possible while a long-term solution is being prepared for implementation by 2021.

Special Condition #2 of the CDP requires the SFPUC to submit an annual report on November 1<sup>st</sup> detailing progress on the long-term solution. The description below is the SFPUC’s first progress report for the period of November 2015 to October 2016.

**BACKGROUND:**

Chronic erosion problems at the south end of Ocean Beach threaten the SFPUC’s Lake Merced Tunnel (LMT). The LMT is one of the SFPUC’s critical wastewater conveyance and storage facilities located under the Great Highway south of Sloat Boulevard. In support of a comprehensive solution to the erosion problem, the SFPUC actively participated in the development of the 2012 Ocean Beach Master Plan (OBMP). The OBMP, led by SPUR, was an interagency effort to develop a sustainable long-term vision for Ocean Beach, addressing public access, environmental protection and infrastructure needs in the context of erosion and climate-related sea level rise. The OBMP presents a framework for understanding the wide range of issues and challenges at Ocean Beach and identifies a series of recommendations for balancing the many priorities and objectives identified by local agencies and stakeholders, including protecting critical wastewater infrastructure south of Sloat Boulevard (i.e. SOB) from erosion hazards.

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To carry out the OBMP recommendations, specifically related to erosion hazards and protection of the LMT, the SFPUC, in coordination with SPUR, the National Park Service (NPS) and other partner agencies, worked to develop short-term coastal protection measures (approved under CDP #2-15-1357) and continue to develop a long-term coastal protection strategy. As a condition of the CDP, the SFPUC is required to develop and begin implementation of a long-term coastal protection strategy by 2021. The strategy should adhere to the coastal management approach outlined in the OBMP and include managed retreat, beach nourishment, and structural protection through adaptive management.

#### **COMPLETED WORK:**

As an initial step in developing the long-term coastal protection strategy, the SFPUC hired SPUR and technical experts to develop a coastal vulnerability and engineering feasibility analyses of coastal protection and management measures (*Coastal Protection Measures & Management Strategy for South Ocean Beach*; ESA, 2015). The purpose of ESA's work was to develop a preferred project concept that would address coastal protection from chronic erosion of the beach and bluffs by wave action, episodic coastal storms and sea level rise. Concepts were developed with the help of a Technical Advisory Committee, which consisted of representatives from agencies such as the CCC, NPS, San Francisco Public Works, BCDC, USGS, NOAA, and US Army Corps of Engineers.

The work assessed the LMT vulnerability based on an analysis of subsurface conditions and projected bluff recession, including existing geotechnical conditions, existing structural condition of the LMT, lateral and vertical cover requirements over the LMT, and assumed wave conditions. The vulnerability assessment was based on two primary lines of analysis; 1) long-term geomorphic response modeling in response to sea level rise, sand supply and shore management actions, and 2) episodic erosion, along with geomorphic change, that violates minimum dimensions of burial for structural stability of the LMT.

Based on the results of the vulnerability and feasibility analyses, the ESA report outlined the preferred project concept for the long-term coastal protection strategy. The report proposes removal of existing coastal armoring, installation of a subsurface, low-profile structural protection for the LMT, periodic sand nourishment, surface restoration actions, and consideration for phasing of the proposed project concept. The structural protection measure under consideration is a pile wall, or similar, which would be constructed from the existing ground surface landward of the bluff face. Installation of the structural protection of the LMT would facilitate the removal of existing coastal armoring (e.g. rock revetments, rubble, and any interim protection devices installed at South Ocean Beach) and include managed retreat, beach nourishment, and adaptive management (e.g. phased approach).

After completion of the ESA report in 2015, the SFPUC Engineering Management Bureau (EMB) began work on the Alternative Analysis Report (AAR). The purpose of the alternatives analysis is to document the thought process that the SFPUC goes through in order to determine which alternative solution is best for addressing the project need and is reversible, minimally impactful and compatible with the OBMP recommendations. An “alternative” is one of several ways of addressing the same need.

The final AAR will analyze a wide range of alternatives, including the concepts developed in the ESA report, removal of the LMT, relocation of the LMT, and a no project concept. The AAR will include an analytical comparison of the alternatives evaluated against specific criteria (e.g. technical, operational, environmental, feasibility, cost, etc.) so that the SFPUC can select the most suitable alternative. The AAR process identifies and quantifies, where possible, preferences between the alternatives developed.

Over the past year, a comprehensive list of alternatives was developed to protect the LMT which includes implementation of various types of structural protection, coastal protection, and removal and/or relocation of existing structures as a means of addressing chronic erosion. Multiple meetings were held with the OBMP team to ensure that alternatives that were discussed during the development of the OBMP were incorporated into the analysis. These coastal engineering concepts are technically complicated, specialized work that is not normally performed by SFPUC staff and thus is requiring more time to complete than anticipated.

Structural protection involves the construction of new structures built to decrease coastal erosion and interfere with sand movement. Relocation of the LMT inland is a way to protect it and to allow for managed retreat. However, in order to remove the LMT from service, its two primary functions, transport and storage, must be replaced. A detailed description of each alternative was completed including alignment siting, operational feasibility and constructability. From the list of alternatives, a screening process is being developed to narrow down the list of alternatives and will be subject to high level cost estimating and scheduling ensuring that the impact of all identified issues is included in the overall project cost estimate and schedule.

On completion of the screening process, an evaluation of all alternatives will be completed in order to identify the alternative that most closely matches the objectives of the OBMP and SFPUC in developing the final project. Evaluation will be completed using criteria previously established in the OBMP and within the SFPUC, the results recorded and the logic behind the scoring described. The AAR is expected to be completed in early 2017 after consultation with the CA Coastal Commission.

**NEXT STEPS:**

Once the most suitable alternative is chosen, the project moves into development of the Conceptual Engineering Report (CER). The purpose of the CER is to define the basis for the design and construction phases of projects and it sets out the information required for environmental review. The CER is considered the 10% design level document. The purpose of a CER is to develop specific design criteria to confirm the concept of the project (e.g., capacity, size,

location, alignment, materials, mitigation measures, geotechnical data, etc.) so that the bid and contract documents can be prepared in a timely manner and to provide input into the environmental documentation process. The SFPUC will commence procurement of a specialized team of consultants to assist with the completion of the CER and design. The CER is expected to be completed in late 2017 at which point environmental review will begin.

If you have any questions regarding this report, please contact YinLan Zhang at [yzhang@sfgwater.org](mailto:yzhang@sfgwater.org) or 415-487-5201.

Regards,

A handwritten signature in black ink, appearing to read "Anna M. Roche", with a long horizontal flourish extending to the right.

Anna M. Roche  
Climate Change & Special Projects Manager  
SFPUC Wastewater Enterprise

Cc: YinLan Zhang, SFPUC, Bureau of Environmental Management  
Brian Carlomagno, SFPUC, Project Management Bureau  
Calvin Huey, SFPUC, Engineering Management Bureau