Strategy Used to Avoid Design and Construction of Active Methane Mitigation Systems

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Background/Objectives. Once home to shipyards, canneries, a sugar refinery, and warehouses from the mid-19th century well into the 20th century, the 300-acre master-planned "Mission Bay" development area within San Francisco is now bustling with mixed-use residential and commercial high-rise buildings, public open spaces, hotel, school, university, a police and fire station, and research and development facilities. As a result of organic material decomposing in the Bay fill as well as underlying organic-rich native peat and bay mud, methane is sometimes detected in soil gas around Mission Bay. Methane mitigation systems (MMS) are typically required on parcels where soil gas methane concentrations exceed the regulatory threshold criterion of 1.25 percent by volume in air (12,500 ppmv) established by the San Francisco Bay Regional Water Quality Control Board (Water Board) for the Mission Bay development area. This presentation will summarize the strategy used to avoid design and construction of active MMS for several developments in the Mission Bay area, thereby saving time and money for clients while still ensuring the safety of future occupants.

Approach/Activities. In 2010, based on detections of methane in soil gas up to 63%v at Block 13E, the Water Board required that an active MMS with sub-slab pressure sensors be designed and installed. Because the Mission Bay area is not on a landfill and does not have an active source of methane, Langan, with technical assistance from the San Francisco Department of Public Health (SFDPH), proposed to proceed with a passive MMS incorporating a contingency plan, which included requirements for post-construction testing for methane in indoor air and the MMS risers and, if the data indicated cause for concern, follow-up actions, up to and including converting the MMS to an active system. The Water Board agreed to this step-wise approach, and during post-construction monitoring, no detectable levels of methane were found in either the risers or indoor air. This contingency plan approach was eventually adopted for four parcels developed between 2012 through 2016, all with similar outcomes.

Results/Lessons Learned. Post-construction testing performed at the Block 13E and additional three new buildings indicated that the threshold criteria for converting passive systems to active mode was not exceeded at any of the buildings. A complete comparison of pre-construction soil gas methane concentrations versus post-construction methane concentration in the MMS risers and in indoor air will be provided in the presentation.

The data obtained at these four parcels have since been applied to other parcels in Mission Bay that had similar, elevated methane concentrations in soil gas, thereby eliminating the need for post-construction methane monitoring, not to mention design, construction and operation of active systems. While other consultants designed active systems that were subsequently determined to be unnecessary, Langan, owing to strong working relationships with the regulatory agencies, was able to successfully negotiate for and demonstrate the success of passive systems, thereby saving considerable expense not only for the clients of the four initial buildings examined in the presentation, but also a number of subsequent clients.