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Draft Final Remedial Investigation/Feasibility Study Report for Parcel E-2, Hunters Point Shipyard prepared by Innovative Technical Solutions, Inc. dated February 2009

This letter contains comments from the City and Lennar.

General Comments

1. The project team and the regulatory agencies need to consider whether the tidal and seasonal freshwater wetland restoration proposed in the Panhandle Area of Parcel E-2 should proceed as long as the Yosemite Slough Bridge is being proposed. The proposed restoration sites are in the footprint of the bridge limit of work including bridge abutments, shoreline protection, and the bridge approaches. If the proposed development on and adjacent to the proposed wetland restoration area is approved, wetland mitigation might be difficult to implement and moving the mitigation to another area should be considered. Mitigation via contribution to the Yosemite Slough project would be appropriate, but mitigation via contribution to a larger restoration effort such as the South Bay Salt Ponds Restoration Project would be even more ecologically valuable by providing for wetland restoration outside such an urban context. In comments on the 2006 draft plan, the California Department of Fish and Game expressed similar sentiments, stating that the general vicinity of the mitigation site would be "highly prone to human disturbance." We request continued coordination with the City/Lennar team regarding the transportation design and to appropriately integrate it with the wetlands mitigation and remedial alternatives design.

Specific Comments

2. **Section ES.2.2. Landfill Gas.** Top of Page ES-6, States that the nature and extent of landfill gas at Parcel E-2 has been adequately defined, but a methane gas survey of the Parcel E-2 panhandle area is planned. Please refer to the additional upcoming investigation.

3. **Section ES.2.4. Groundwater.** Top of page ES-7, State that radium-226 was also detected and that radiological sampling results from the Groundwater Data Gaps investigation will be presented in a separate technical memorandum and evaluated in the radiological addendum to the FS.

4. **Section ES.3.1 Risk Assessment, Soil.** First paragraph Page ES-9, clarify that the Screening Level Ecological Risk Assessment also assessed sediment

5. **Section ES.3.2. Landfill Gas.** Bottom of page ES-9, State that "hazardous levels of landfill gas" is comprised of methane versus nonmethane organic compounds (NMOCs) as the paragraph above states that NMOCs do not pose an unacceptable risk to human health. Also clarify that migration of methane beyond the fence line and E-2 Landfill boundary must be controlled.

6. **Figure ES-1.** Delete TCRA from Notes, not used on figure.

7. **Sections 3.8.8, 4.2.1, 4.4.1, 8.2.3.1, and 8.4.1.** Once material potentially presenting an explosive hazard (MPPEH) has been assessed and documented as not presenting an explosive hazard, it should be referred to as "material documented as safe (MDAS)" rather than "MPPEH scrap." Please revise the referenced sections accordingly.

8. **Section 4.1.1.2 and Figure 4-1.** Why is the location, or locations, of the MDAS found within the PCB Hot Spot Area not presented on Figure 4-1? The prior location(s) of where MDAS has been found will be important when planning and implementing the remedial alternatives.

9. **Section 4.1.2.1, Page 4-6 last paragraph.** For the locations of the GMPs, Figure 3-6 should be referenced, instead of Figure 3-7.

10. **Section 4.2.3.1, Page 4-21, 3rd bullet.** For the location of the passive vents, Figure 3-6 should be referenced instead of Figure 3-7.

11. **Section 4.2.3.3, Page 4-22.** The Figure referenced in this section should be Figure 3-6 instead of Figure 3-7.

12. **Section 4.2.4.3, Page 4-31, Arsenic discussion**. The text indicates that there are 21 samples (17 locations) where concentrations of arsenic exceed the RIEC; however, only 16 locations are presented on Figure 4-39. Please rectify the apparent discrepancy.

13. **Section 4.2.4.3, Page 4-32, Total PCBs discussion.** The text indicates that there are 31 samples (25 locations) where concentrations of total high risk PCBs exceed the RIEC; however, only 23 locations are presented on Figure 4-44. Please rectify the apparent discrepancy.

14. **Section 5.7.2.2, Page 5-27.** Zinc discussion (2nd to the last sentence). Please change the reference to "elevated concentrations of lead" to "zinc."

15. **Section 8.2.3.1, Page 8-14, First paragraph.** We were unable to locate the definition for "munitions hardware" in either the Department of Defense (DoD) Ammunition and Explosives Safety Standards (DoD 6055.9-STD) or Ammunition and Explosives Safety Standards (NAVSEA OP 5, Vol 1). Please define the terminology or substitute standard DoD terminology.

16. **Section 11, General**. Section 11 of the RI/FS includes the evaluation of several technologies according to the criteria of effectiveness, implementability, and cost. However, this section does not provide any explanation as to why certain technologies were retained for further analysis and others were not. For

each technology that was not retained for further analysis, we recommend clarifying why this decision was made.

17. **Section 11.1, Page 11-3**. The RI/FS general response actions (GRAs) for groundwater include no action, institutional controls, and containment, but do not include removal action. It is unclear why a groundwater removal action, such as ex-situ or in-situ groundwater remediation, was not considered. Please clarify.

18. **Section 11.5.5.1, Page 11-39.** As described in this section, the existing sheet pile wall on Parcel E-2 was reportedly difficult to install indicating that the Implementability is likely not Moderate to High as discussed below in Comment #22 and the sheet-pile wall was not included in the included in the remedial alternatives evaluated. Please revise.

19. **Section 11.5.4.3, Page 11-36.** The Destruction using Non-Combustion technology is discussed in this section and is retained for further analysis following collection of additional data regarding gas volume and composition. However, the RI/FS does not mention plans for any such additional data collection or plan to evaluate this technology further in the future. Please clarify when and how this technology will be further evaluated.

20. **Section 11.5.5, Groundwater Containment and Leachate Collection.** Please explain how diversion of groundwater flow may limit or impact future development plans.

21. **Section 11.5.5.5, Hydraulic Containment through Permeable Reactive Barrier.** The permeable reactive barrier technology is rated low for long-term effectiveness because the reactivity of the barrier would slowly be reduced over time. Please clarify that for long-term permeable reactive barrier applications, it is common to re-furbish or re-inject reagent into the barrier periodically to regain the full level of effectiveness. The loss of reactivity over time is both a matter of decreasing effectiveness and of increased or higher long-term O&M costs unless the entire plume would flow through the wall within the initial time-frame of high reactive effectiveness.

22. **Figure 11-2 Results of Remedial Technologies and Process Options Evaluation.**

    On page 2, under Landfill Gas Collection, General Response Action, change "Containment" to "Removal" as landfill gas is not typically contained.

    On page 3 under Groundwater, Physical Barrier Process Options, Sheet Pile Wall change the Effectiveness rating to Low to Moderate, the Implementability rating to Low, and the Cost to Moderate based on the fact that additional hydraulic controls will be needed and the sheet pile wall may leak. Per Comment # 24 below, it does not appear that this technology option was retained for analysis. If so, state "No" rather than "Yes" under Retained for Analysis.

    On page 3 under Groundwater, General Response Action, add "Treatment" below Containment and link to Reactive Barrier. Under Comments, revise the first sentence to indicate that for long-term permeable reactive barrier applications, it is common to re-furbish or re-inject reagent into the barrier periodically to regain the full level of effectiveness. The loss of reactivity over time is both a matter of decreasing effectiveness and of increased or high long-term O&M costs unless the entire plume would flow through the wall within the initial time-frame of high reactive effectiveness. The second sentence regarding tidal

environment should come first as this appears to be the primary factor limiting effectiveness.

Were reactive core mats screened as a possible technology for sediment and groundwater containment and remediation? Some CETCO examples of reactive core mats can be viewed at the following links:

http://www.sedimentremediation.com/GeosyntheticClayLiners.aspx

http://www.sedimentremediation.com/ReactiveCoreMat.aspx

23. **Section 12.2.3.6, Page 12-20.** It is not clear why the multilayer geosynthetic cap was selected for the landfill area while the single-layer geosynthetic cap is selected for the adjacent areas. Please explain why each is appropriate for the proposed areas. If appropriate, use the Site Conceptual Model presented in Section 6.2.1.2 East Adjacent and Panhandle Area Soil (isolated areas of waste) as the basis for the selection.

24. **Section 12.2.4, Page 12-24.** The groundwater physical barrier containment technologies of sheet piles and slurry walls were retained for further analysis in Section 11. In Section 12, however, it appears that only slurry walls are incorporated in the remedial alternatives. Please clarify why sheet pile technology was removed from consideration.

25. **Section 12, Development of Remedial Alternatives.** Where applicable, please include language to the effect that all alternatives that include excavation of solid waste and contaminated soil should be performed by workers that have undergone munitions and explosives of concern (MEC) recognition and safety training.

26. DTSC and USEPA are currently working to develop guidelines for incorporating sustainability metrics and criteria into Feasibility Evaluations. These metrics may include:
    1. Life cycle impacts of materials used in remediation
    2. Greenhouse gas emissions
    3. Energy consumption (generators and electricity)
    4. Other resource depletion (open space, clean fill, water, habitat destruction/disturbance
    5. Financial break-even point

    Though regulatory guidelines have not been established, we suggest incorporating reasonable sustainability metrics into the development and evaluation of remedial alternatives. For example, managing the waste onsite decreases the impact to the environment during remediation by decreasing the amount of truck traffic, the use of fossil fuels, and air emissions of particulates, nitrous oxides, sulfur dioxides, VOCs, and greenhouse gases from diesel-powered trucks and excavation equipment.

27. **Figure 12-1.** Clarify the line type on the figure of the "Approximate Limit of Geosynthetic Cap."

28. **Appendix R, Detailed Cost Estimates and Assumptions.** Based on the finding of MDAS within Parcel E-2, it seems prudent that all remedial alternative cost estimates that include intrusive activities, such as Hot Spot Removal, include costs associated with MEC avoidance. Please add these costs.

Appendix Q Qualitative Slope Stability Evaluation

29. The edge of the landfill is blanketed by fill. Underlying the fill is a layer of loose to medium dense sand that is potentially liquefiable. Below the sand is a layer of medium stiff to stiff clay locally referred to as Bay Mud. We previously provided some comments on the Draft Parcel E-2 RI/FS regarding the strength of the Bay Mud used in the analysis and details of the proposed remediation of the slope. Since our initial evaluation, we were provided with the raw data for nearby CPT-16 and have been informed that the slope of the proposed remediation will be flattened from 2:1 (horizontal to vertical) to 3:1.

    We previously commented that the assumed shear strength 1,000 pounds per square foot (psf) for the Bay Mud appeared to be too high for the given overburden pressure and that additional analysis should be performed to check for global stability issues. The data for CPT-16 indicates a shear strength of 1,000 psf is appropriate. We understand portions of the Bay Mud may be over excavated and that additional sampling of the Bay Mud may be performed. We suggest additional shear strength tests be performed to confirm the shear strength of the Bay Mud. Furthermore, because CPT-16 classifies the Bay Mud as a silt, we recommend that the design team check if cyclic softening of the silt is an issue during a major earthquake and the appropriately reduced shear strength, if necessary, be used in the analysis.

30. The proposed remediation plan presented in Section Q6 of Appendix Q shows an HDPE liner and a geogrid placed directly on top of the HDPE liner. The HDPE liner does not appeared to be modeled in the slope stability analysis. The friction value between the geogrid and HDPE liner or the HDPE liner and soil could be less than the value assumed for the fill. We understand that additional slope stability analysis will be performed which takes into account the flatter slopes. At that time, we recommend the slope stability analysis include the HDPE liner and geogrid and model these materials with the appropriate strength parameters. The interface between the soil and the HDPE or HDPE and geogrid could be a potential failure plane. Finally, we recommended that embedment of the geogrid behind the landslide mass be checked to see if the force required to stabilize the slope can be developed in friction.

Sincerely,

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