



March 6, 1998

File No. 2189.8009 (CJC) Pete Wilson
Governor



San Francisco Bay
Regional Water
Quality Control
Board

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Commanding Officer
Engineering Field Activity, West
Naval Facilities Engineering Command
Attn: Mr. Stephen Chao
900 Commodore Drive
San Bruno, CA 94066-2402

**Subject: Site 22 Draft Feasibility Study Report (FS), Moffett Federal Airfield,
January 1998**

Dear Mr. Chao:

The San Francisco Bay Regional Water Quality Control Board (RWQCB), in conjunction with the Integrated Waste Management Board (IWMB), has reviewed the subject report.

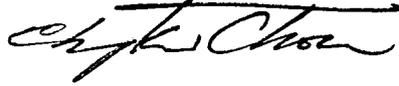
This report is well organized, and concisely documents the Navy's efforts in characterizing the potential health risks to the public and the environment and evaluating the remedial alternatives. The RWQCB has the following comments for your consideration:

1. The boundary of Site 22 needs to be accurately identified. The RWQCB recommends to conduct intrusive investigation to delineate the horizontal and vertical extent of the site. The purpose of trenching or potholing is not to further characterize the landfill contents but to provide valuable information in selecting preferred remedial alternative. This method has been proved useful at Site 2 landfill consolidation process.
2. Based on the State Water Resources Control Board (SWRCB) Resolution Number 88-63, the groundwater within the Site 22 area does not qualify as a potential drinking water aquifer because its high salinity (total dissolved solids > 3,000 ppm). However, the San Francisco Bay RWQCB Basin Plan (1995) should be considered as applicable or relevant and appropriate requirements (ARARS) in order to protect other beneficial uses of the groundwater. Groundwater monitoring should be in accordance with provisions of Title 27, California Code of Regulations (CCR), Subchapter 3. USEPA ambient Water Quality Criteria (AWQC) and RWQCB Basin Plan Water Quality Objectives should be considered in deriving groundwater monitoring concentration limits.
3. The RWQCB agrees with the Navy that it is easier to implement and maintain a biotic barrier (Alternative 2) than a multilayer cap (Alternative 3). However, more importantly, the multilayer cap will effectively minimize infiltration, and will further reduce offsite leachate migration.



The IWMB comments are enclosed. If you have any questions on these comments, please contact me at (510) 286-1035.

Sincerely,



C. Joseph Chou
Remedial Project Manager

enclosure

cc:

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Integrated Waste Management Board
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Pete Wilson
Governor

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Secretary for
Environmental
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February 3, 1998

Mr. Joseph Chou
San Francisco Bay Area Regional Water Quality
Control Board (RWQCB)
2101 Webster Street-Suite 500
Oakland, CA 94612

Subject: Moffet Federal Airfield, California, Site 22, Draft Feasibility Study
Report, Date: January 9, 1998

Dear Mr. Chou:

The California Integrated Waste Management Board (IWMB) appreciates the opportunity to provide you with input for the subject report. IWMB staff has reviewed the Draft Feasibility Study for the Site 22 Landfill and provide the comments below as they relate to IWMB Applicable or Relevant and Appropriate Requirements (ARARs). Please note that comments regarding Section 1.3.3. (Hydrogeology) and 2.1.1 (Landfill Refuse and Groundwater RAOs), which are water quality issues, e.g. leachate, infiltration and groundwater are provided for your information as requested.

1.3 Site 22 Characterization

- 1) Based upon the amount of waste estimated in place (150,000 cubic yards based on a 7-acre, 13-foot thick waste prism), it appears that off-site clean-closure would be cost prohibitive. However this estimate should be based on waste quantities estimated from intrusive investigation field data (logs from trenching and potholing), which was not obtained during the feasibility study.
- 2) IWMB recommends that an intrusive investigation be performed to collect field data which will clearly define the horizontal and vertical extent of the landfill prior to selection of a remedy including capping and monitoring. Once field data is obtained, and waste quantities are estimated, better-defined work scopes for remedial decisions can be made regarding capping, monitoring, consolidation, clean-closure, etc.
- 3) An intrusive field investigation may be beneficial to determine if shallow waste areas may be consolidated on-site (within the current footprint) to minimize the landfill cap area and minimize the removal of mature trees.



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1.3.3 Hydrogeology

- 1) Are soils and waste above the water table under saturated conditions, i.e. at optimal moisture content? Is infiltration through the current cover from golf course irrigation, moving under saturated flow conditions?
- 2) Based on statistical data presented in Appendix D, Table D1 & D2, the landfill has statistically impacted groundwater quality (primarily with inorganic constituents), even though groundwater quality is considered non-beneficial use due to high TDS.
- 3) It appears that a mounding of groundwater (leachate mounding) is present within the landfill based on static water levels shown on figure 6 & 7 (p.70). If this mounding is due to hydraulic head caused by golf course irrigation, a multi-layer cap may be the only feasible alternative since infiltration at this site is "not being minimized to the greatest degree possible" and the current site-use is adversely impacting landfill conditions.

1.3.4 Site 22 Nature and Extent of Contamination (Landfill Gas)

Air SWAT data and levels of methane in the fill reported during drilling of wells within the waste mass (reference boring logs for SBGC-1 and SBGC-4), indicated methane gas concentrations of 51% and 30% of the Lower Explosive Limit (LEL) or 1.55% (15,500 ppm) and 2.5% (25,500 ppm) methane concentration by volume in air, which may indicate that landfill gas generation may be curtailing. IWMB staff, however, recommends that the four gas monitoring probes proposed in the FS be installed and constructed in accordance with 27 CCR Section 20925, i.e. multi-depth, gravel packed, bentonite sealed, etc. and that quarterly monitoring be performed for 12 quarters to obtain data which could be used to obtain a waiver to further gas monitoring in the 30-yr postclosure maintenance period.

2.1.1 RAO for Landfill Refuse/Groundwater

IWMB staff recommend that an RAO should be to reduce infiltration into the landfill, whether through ceasing irrigation activities or installation of a prescriptive cover system capable of controlling the impact of irrigation activities.

4.3 Alternative 3: Multilayer Cap

Based upon the data presented in the feasibility study, the current land-use, and remedial actions performed at the Site 2 Landfill (with similar site conditions), IWMB recommends that the appropriate action for this site is to perform a capping and monitoring action. To minimize infiltration, the cap should meet prescriptive standards, i.e., multilayer cap using a low-permeability barrier layer or geosynthetic alternative and an irrigation control system to minimize the impact of this activity on landfill conditions. It may be possible, if a suitable borrow source can be found, to install a two foot thick cover (1 foot barrier and 1 foot of vegetative) over a reconditioned foundation, i.e. the present soil cap, which is 1.5 to 3 feet thick (moisture-conditioned and recompacted). This may help to minimize import soil costs, yet still achieve a multi-layer cap. If barrier layer soil of similar quality to the "Yacht-Harbor" soil used to cap Site 1 can be found, the cost of a multi-layer cap may be further minimized.

January 28, 1998 Site Visit

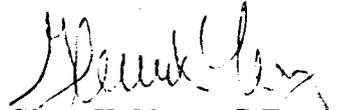
Mr. Don Chuck, Geotechnical Engineer, (Moffett NAVFAC Field Operations Office), provided a very informative field tour of the Golf Course Landfill (Site 22). It was observed that the landfill surface was a golf course fairway and putting green and appeared to be well-vegetated and maintained, with no erosion evident. Mature trees lined both sides of the fairway. Differential settlement was difficult to determine due to contouring of the site. Site slopes and grades promoted on-site run-off and drainage and no ponding was evident on sloped surfaces. Ponding was evident in flatter areas adjacent to sloped areas.

Other Landfills with Golf Course Land-use Applications

It should be noted that other landfills, particularly in southern California, have been converted to golf-course postclosure land-uses (Sheraton Hotel and Golf Course, City of Industry; North Island NAS Golf Course, San Diego, etc.). Although some of these landfills were closed prior to the promulgation of landfill closure regulations, they are still subject to corrective action should they be deemed a threat to public health and safety and the environment. Landfills currently being proposed for postclosure land-use as golf courses are being required by both IWMB and RWQCBs to implement cover systems and irrigation control to minimize the impact of such activities on landfill conditions or accommodate environmental control systems such as gas extraction systems or groundwater treatment systems. If you would like more information on the implementation of landfill closures involving golf courses, IWMB staff can provide such information.

IWMB staff look forward to working with your agency on the implementation of a remedial project at this site which will satisfy all applicable or relevant and appropriate requirements. If you have any questions please feel free to contact me at (916) 255-3830.

Sincerely,



Glenn K. Young, P.E.
Remediation, Closure & Technical Services
Permitting & Enforcement Division