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MOFFETT FIELD
SSIC NO. 5090.3

Santa Clara Valley Water District

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August 21, 1995

Mr. Don Chuck
Navy Environmental Office
P.O. Box 68, Building 107
Moffett Field, CA 94035

Dear Mr. Chuck:

Subject: Review Comments on Moffett Federal Airfield, Operable Unit 1 Final Feasibility Study Report—May 15, 1995

This presents our comments on the above subject report prepared by PRC Environmental Management, Inc.

The Operable Unit 1 Final Feasibility Report (OU1FS) covers the final remedial plan for two refuse landfills: Site 1—Runway Landfill and Site 2—Golf Course Landfill. The content of the landfill refuse could have ranged from inert demolition debris to hazardous materials.

Our comments are relative to three general categories: (1) contradictory and unsupported statements relative to site characterization for Sites 1 and 2, (2) remedial plan for Sites 1 and 2, and (3) the long-term operation of the drainage pumping at Building 191.

ITEM 1—SITE CHARACTERIZATION OF SITE 1

On page 14 under Site 1 Hydrogeology, the statement that water level elevations within the landfill indicate that refuse is saturated is contradicted by the following sentence which says approximately the bottom one-third of Site 1 is saturated.

The discussions under Hydrogeology, page 18, and under Leachate Migration, page 74, indicate soil and groundwater data show that significant clays exist around the landfill. This combined with laboratory permeability tests on "undisturbed" soil samples, differences in potential piezometric heads within the different components of the groundwater bodies delineated by restrictive flow, and finding limited evidence of lateral migration of leachates lead to the conclusion that there appears to be no leachate migration from the Site 1 landfill. This conclusion has not been substantiated as:

1. The cross section presented as Figures 5, 6, and 7 show aquifers within the clay deposits have separations through clay beds at the site as little as 4 feet to the A1 aquifer. The occurrence of the next deeper aquifer layer (A2 aquifer) was not explored as borings depth was terminated a few feet below the A1 aquifer.

2. Laboratory permeability determinations of clay samples usually understates the true permeability as the samples become compacted during the sampling process. Furthermore, they represent a

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very small sampling within a vast system, often overlooking potential natural "defects" within a block of soil.

3. The delineation of two separate groundwater bodies as depicted on Figures 12, leachate potentiometric surface, and 13, A1 aquifer potentiometric surface, has not been substantiated. The leachate potentiometric surface map was interpreted by using wells constructed within the landfill and the A1 aquifer potentiometric map was interpreted by using wells only along the edges of the landfill. The distinction of the two groundwater bodies cannot be made without constructing a monitoring well within the A1 aquifer beneath the landfill to determine if a common groundwater body exists with a groundwater mound occurring within the landfill, as an alternative scenario. Such an alternative common aquifer scenario is depicted in Figures 5, 6, 7, and 11, showing a common connected groundwater body with a mound within the landfill. This would imply the clay deposits are leaky.

   Aquifer tests conducted for the Operative Unit 5 remedial investigation indicated the clay cap overlying the A1 aquifer in the general site area to be leaky. The Santa Clara Valley Water District (District) had also performed aquifer tests in the Palo Alto flood basin area (a similar Bay esturine area) and also found the clay cap and the next lower aquitard to be leaky. Studies of contaminant discharges in Silicon Valley and in areas bordering the baylands have also indicated the clay cap and the next intervening aquitard to be leaky.

4. Hydrographs of groundwater levels in monitoring wells along the edges of the Site 1 landfill in the A1 aquifer shown as Figure 8A and the monitoring wells completed in the landfill refuse shown as Figure 8C show a close tracking of fluctuations indicating that the two bodies of groundwater to be connected. They both show highest levels in the spring of the year and the lowest in the fall of the year. They also indicate that the groundwater mound that accumulated in the landfill (as leachate) culminating in highest levels in the spring leaks out of the landfill reaching their lowest levels in the fall.

   We believe that further studies should have been conducted at Site 1, in particularly to the testing of the clay cap and the A1 aquifer beneath the landfill, and, if required, of the A2 aquifer beneath the landfill.

   In addition, further exploration should be performed along the south side of the Site 1 landfill between monitoring wells W1-14 and W1-15, a downgradient area lacking characterization. This is to check possible southward leachate migration (refer to Figure 13). A permanent monitoring well in the A1 aquifer is required and possibly another separate well sensing the A2 aquifer may be required.

   Although it could be concluded that the A1 aquifer is contaminated by saltwater intrusion at Site 1, certain contamination in the leachate still have the potential to affect the baylands ecosystem. Furthermore, the condition of the A2 aquifer beneath the site area is yet unknown.

ITEM 1—SITE CHARACTERIZATION OF SITE 2

On page 50 under Site 2 Hydrogeology, the text indicates that similar conditions as Site 1 exist in that nearly impermeable clay beds occur beneath the landfill. However, there appear to be no mounding of groundwater within the landfill as at Site 1. Groundwater levels occur at the bottom of the landfill as

Site 2 is located adjacent to the drainage pumping station at Building 191. Again, as at Site 1, the integrity of the clay beds to be nearly impermeable has not been substantiated. As at Site 1, the hydrographs in the A1 aquifer (Figure 21) and leachate levels (Figure 22) appear to fluctuate coincidentally, indicating a common groundwater body. Leachate (and also groundwater) fluctuating from a yearly highest level in the spring to lowest levels in the fall indicate leachates are migrating from the landfill. Any plume migration in the A1 aquifer would be controlled by drainage pumping at Building 191.

The report states on page 55 that borehole logs and associated cross sections also show that there are inert fill soil (sand and gravel) devoid of refuse located below the water table within landfill boundaries. However, on Figure 18, borehole W2-10 shows refuse below the water table atop a silty sand aquifer bed (A1 aquifer). Refuse characterized in boring W2-10 indicated metal inclusions, tar, petroleum odor, and polychlorinated biphenyls at 28,000 parts per billion (ppb). Arsenic was noted to be 1,830 ppb in the leachate. Nearby monitoring well, W2-8, indicates a relatively high vinyl chloride content of 120 ppb in the leachate (Appendix B).

The A2 aquifer was not explored beneath the landfill. Monitoring well W2-7, located on the eastern edge of the landfill, is completed in the A2 aquifer but we were unable to find any analytical datum for this well in Appendix C. This well may be located on the upgradient side of the landfill.

Lateral plume migration away from the site through the A1 aquifer generally has not been apparent. The A1 and A2 aquifer beneath the landfill are yet to be tested.

ITEM 2—REMEDIAL PLAN FOR SITES 1 AND 2

We believe capping of the sites along with attendant gas interceptor trench, groundwater collection trench, and a monitoring program would serve as an appropriate remedy for Sites 1 and 2. In as much as there appear to be uncertainties in possible inclusions of hazardous materials in the landfill and incomplete characterization of the sites, we believe a cap with the greatest optimal performance be installed. In addition, the monitoring gap at Site 1 between wells W1-14 and W1-15 would have to be remedied.

ITEM 3—LONG-TERM PUMPING AT BUILDING 191

We believe the Navy should provide assurances that the drainage pumping at Building 191 be sustained in order to provide long-term effectiveness of the remedy. Long-term pumping would also be required for the effectiveness of mitigations to be proposed for other operative units on the base.

Although it is the District's desire that implementation of the final remedy be initiated as soon as possible, we believe our concerns be appropriately addressed or the feasibility study be appropriately amended first.

We are also represented on the Restoration Advisory Board (RAB) and on the Technical, Historical, and Educational Committee (Committee) of the RAB. We substantially concur with the comments brought forth by the Committee for the OU1FS.

Thank you for providing us the opportunity to comment on the OU1FS and for extending the comments period. Please call me at the Camden Office, (408) 927-0710, extension 2631, should you have any questions.

Sincerely,

Thomas I. Iwamura

Thomas I. Iwamura
Engineering Geologist
Groundwater Quality Branch