

Arc Ecology

Environment, Economy, Society, & Peace

February 3, 2004

Keith Forman
Naval Facilities Engineering Command
Southwest Division
1230 Columbia Street, Suite 1100
San Diego, CA 92101-8517

Re: Draft Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Basewide Groundwater Monitoring Program, Hunters Point Shipyard, San Francisco, California, dated December 18, 2003

Dear Mr. Forman:

Thank you for providing Arc Ecology with the opportunity to review the *Draft Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan), Basewide Groundwater Monitoring Program, Hunters Point Shipyard, San Francisco, California*, dated December 18, 2003. Arc Ecology has the following comments on the plan:

Bedrock water-bearing zone characterization: Based on the information provided in this document, it is not clear that the Navy has sufficiently sampled and characterized the water-bearing zone (WBZ) of the bedrock across Hunters Point Shipyard. Individual fractures or fracture zones may provide conduits for contaminant migration within the Shipyard, from the Shipyard to San Francisco Bay, and/or from the Shipyard to non-Navy property. Please revise the parcel-specific groundwater sampling designs for each parcel and for each remedial unit to specifically address the issue of characterization of possible contamination in the bedrock, either modifying the sampling and analysis plan to better characterize the bedrock or explaining the rationale for why no additional characterization is needed, citing the specific data sources and investigations to support that rationale.

Bedrock monitoring wells and cross-contamination: Open boreholes completed in bedrock have the potential to create pathways between fracture zones not otherwise connected, thus creating opportunities for contaminant migration to fractures or fracture zones not previously contaminated. In cases of wells already completed in bedrock and proposed wells to be completed in bedrock, please explain how the Navy is either determining that there is no potential for cross-contamination within an open well or preventing cross-contamination where ambient flow exists.

Beneficial use of drinking water exemption: In Section 1.1.8 *Technical or Regulatory Standards* and Section 2.4 *Groundwater Beneficial Use*, the Navy states that the A-aquifer has been

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exempted from the beneficial use of drinking water. The Navy also states that the B-aquifer and bedrock WBZ are considered potentially suitable as municipal or domestic water supplies and the most stringent of federal or state primary maximum contaminant levels for drinking water will be used as evaluation criteria for these zones. However, in Section 1.3.2.6 *Detection and Quantitation Limits*, the Navy states, “RWQCB has determined that groundwater at HPS has no beneficial use as drinking water (RWQCB 2003).” The Regional Water Quality Control Board letter to the U.S. Navy dated September 25, 2003, and cited in Section 1.3.2.6 only addresses an exemption for Aquifer A. Please confirm that as of the date of this document, only Aquifer A (and not all groundwater) at Hunters Point Shipyard has received an exemption from beneficial use as drinking water requirements and correct the report text as necessary.

Groundwater level measurement: It is not clear at which wells the Navy will be measuring groundwater levels on a quarterly basis. On page 6 the Navy states that it will monitor water levels in 326 wells. On page 27 in Section 3.4 *Groundwater Levels*, the Navy states that water level measurements will be made in “a total of 366 wells” but cites the list of wells in Table G-1, which lists 414 wells. Table 3C states, “The Navy will conduct quarterly groundwater level measurements at 346 existing and new A-aquifer, 39 existing and new B-aquifer, and 27 existing and new bedrock water-bearing zone wells at HPS,” which is a total of 412 wells. Please clarify the number of wells where quarterly groundwater levels will be measured, and specify at which wells these measurements will be made. Please make any corrections necessary to the text and tables to address these discrepancies.

Sanitary sewer system impact on groundwater flow: The document repeatedly refers to groundwater flow patterns interpreted to be a result of water removal by pumping of the sanitary sewer system with ruptured lines below the groundwater table at Hunters Point Shipyard. Therefore, the Navy can reasonably expect that if pumping patterns change significantly, groundwater flow and thus contaminant migration patterns may change significantly. The Environmental Protection Agency states in its February 2, 2004, comment letter to the Navy about this document that some of these sanitary sewer lines are being blocked off. Please explain, and address in the text of the document, how the Navy will monitor for planned and unplanned changes in these pumping rates and patterns, how the Navy will determine resultant changes in groundwater flow patterns, and how the Navy will identify and respond to any needed changes in the groundwater monitoring plan in a timely manner.

Seasonality of results: In Section 3.2 *Isolated Detections of Organic Chemicals and Hexavalent Chromium* and Section 3.3 *Isolated Elevated Metals Concentrations*, the Navy states that it only requires one result from the dry season and one result from the wet season to evaluate potential seasonal effects on isolated detections of chemicals of concern. This is not sufficient for identifying seasonal trends and differentiating between seasonal variations versus anomalous detections that may be attributed to other causes. The Navy would need a minimum of two to three samples in the wet season and two to three samples in the dry season to be able to begin to identify possible seasonal trends or changes. The proposed criteria for evaluation of isolated detections should be revised accordingly.

Isolated elevated metals concentrations: In Section 3.3 *Isolated Elevated Metals Concentrations*, the Navy states, “In general, a metal was selected for analysis only if an industrial source for the

metal could be identified.” This approach assumes that the Navy has comprehensively identified all possible sources of high metal concentrations and all possible pathways for subsurface migration of these metals. Given that the Navy has repeatedly encountered higher concentrations of chemicals of concern than expected and that the Navy has continued to identify additional sources of contamination, these do not seem to be reasonable assumptions, and lack of a known industrial source is not a reasonable justification for not sampling for and investigating elevated metal concentrations.

Groundwater sampling locations: On the tables for Proposed Groundwater Sampling Locations, Analyses, and Rationale, it is unclear how the Navy is using the labels “upgradient edge,” “leading edge,” or “lateral edge” of plume, and “within” or “beneath” plume. It is unclear how an individual well (e.g., IR28MW399B, IR28MW173B, and IR28MW255F) can be sampled both within and below a plume, for example, unless the Navy is doing discrete zone monitoring and sampling within a well or using a multilevel sampler, or how an individual well (e.g., IR28MW315A, IR28MW315B, and IR28MW315F) can be both at the leading edge and the lateral edge of an individual plume. Please better define the plume relationship labels used as part of the rationale. Please also explain, either in the associated text or within the table, what criteria are used to define the boundaries of the plumes being referenced.

Impact of removal actions on Groundwater Monitoring Program: The Navy currently has plans for removal actions and/or treatability studies at various sites across the Shipyard. What wells included in the Groundwater Monitoring Program will be affected by these plans? If any of the wells will be affected, please explain how the Navy plans to revise the sampling and analysis plan to address these issues.

Specific comments:

RU-C1:

- How has the southern edge of the RU-C1 (Figure 5) been delineated, given that there are no wells for 180 feet south of this boundary, as shown?
- All wells shown on Figure 5 are delineated as within the area of VOC contamination, except for IR28MW171B and IR28MW171A. How is the Navy monitoring for changes in the leading edge of the plume and possible discharge into the San Francisco Bay?

RU-C4:

- The rationales for TPH sampling in IR2828MW201F and IR28MW211F are not given in Table 7D. Please adjust text in table as needed.
- On page 34, the document references changes based on the Phase III Parcel C GDGI report. Figure 7 does not reflect the referenced changes in the conceptual model for groundwater flow direction or the eastern boundary of the plume.
- If the groundwater in the A Aquifer is generally flowing to the southwest, how is this edge of the plume and possible migration toward the Bay being monitored? There are no wells indicated between the edge of the plume, as delineated, and the San Francisco Bay.

RU-C5:

- On Page 35, the Navy states that pesticides are known to exist at IR-25 at concentrations exceeding evaluation criteria. If this is the case, what is the Navy's rationale for not sampling any of the IR-25 plume monitoring wells for pesticides?

Parcel C, Other Monitoring Locations:

- Based on the maps provided, IR06MW50F may also be downgradient of IR25. What is the rationale for not sampling this well for VOCs or PCBs?
- If molybdenum has been identified in IR29MW85F at levels above HGALs, what is the rationale for not sampling this well for molybdenum as part of the Groundwater Monitoring Program (GWMP)? If this metal has been identified at levels above HGALs, then it should be sampled for during the GWMP, regardless of whether or not a known source has been identified.

Section 6.0, Parcel D Groundwater Sampling Design: Please clarify the description of the aquifer system at Parcel D, as described on page 37. The bulleted text states that the aquifer system consists of the A-Aquifer and that the B-Aquifer is part of the A-Aquifer, but the text below differentiates between the A- and B-Aquifers and their relative hydraulic parameters.

In addition, it would be helpful to the reader to include a basewide map indicating the wells that are part of the proposed Groundwater Monitoring Plan, in addition to the existing localized maps already included in the document.

Arc Ecology appreciates having the opportunity to review this document. If you have any questions about the comments, I can be reached at (415) 495-1786 or Cian_Dawson@mindspring.com.

Sincerely,

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Staff Scientist

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