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HUNTERS POINT
SSIC NO. 5090.3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

October 30, 2000

Mr. Richard Mach
Department of the Navy
Naval Facilities Engineering Command
Southwest Division
BRAC Office
1220 Pacific Highway
San Diego, CA 92132-5190

Re: EPA review and comment on the Draft Manganese Screening and Implementation Plan, Parcel B, Hunters Point Shipyard, 9/20/00

Dear Mr. Mach:

EPA has completed its review of the above referenced documents. Our comments are presented in an attachment to this letter.

If you have any questions, please contact me at 415-744-2409.

Sincerely,

Claire Trombadore
Remedial Project Manager

cc: Dave Demars, Navy
Rich Pribyl, Navy
Mike Wanta, TtEMI
Tom Shoff, TtEMI
Brad Job, RWQCB
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Adam Klein, Tech Law, Inc.
Dr. John Wakabayashi

ATTACHMENT 1
REVIEW AND COMMENT
DRAFT MANGANESE SCREENING AND IMPLEMENTATION PLAN
PARCEL B, HUNTERS POINT SHIPYARD

General Comments

1. Discussion in the Draft Manganese Screening and Implementation Plan, Parcel B, Hunters Point Shipyard (the Manganese Plan) seems to assert that ambient levels of manganese at HPS are higher than the HPAL, due to the presence of high levels of manganese in chert and basalt rock at HPS. However, the Navy has not provided sufficient evidence in the Manganese Plan to verify this assertion.

   In order to collect sufficient evidence to support the changes to manganese ambient levels, the Navy may have to conduct a revised background study at Parcel B. The revised background study may include characterization of the source material used for the fill at HPS, including sampling of bedrock and/or soils from areas used to derive the fill, and a statistical analysis of manganese concentrations in soil at HPS. The BCT should discuss this at a future meeting.

2. The Manganese Plan does not provide sufficient information to confirm the Navy's assertion that the manganese detected at the eleven excavation areas in Parcel B are due to naturally occurring manganese in fill at HPS, which was derived from chert and basalt bedrock. The data presented in Table 2 of the Manganese Plan do not show a good correlation between high concentrations of manganese in the confirmation soil samples and high concentrations of manganese in the rock fragments separated out from these soil samples. For example, for excavation 24-8, all three of the soil confirmation samples exceeded the manganese cleanup goal, but only one of eight chert/basalt rock fragments separated out from these samples contained manganese concentrations in excess of the cleanup goal. Despite this lack of correlation, according to the Navy's proposed Decision Flowchart for Manganese Screening (Figure 2 of the Manganese Plan) excavation 24-8 would require no further action, because one rock fragment exceeded the manganese cleanup goal. If the Navy wishes to pursue this approach for screening manganese-only sites at Parcel B, they must develop more convincing evidence linking the presence of elevated concentrations of manganese in the confirmation soil samples to naturally occurring manganese in the fill.

3. The Manganese Plan does not clearly present the analytical data for each of the affected excavations at Parcel B. Tables 2 and 3 present some of the analytical data collected at each of the excavations, but it is not clear if the data presented are comprehensive. In order to evaluate the excavation sites for elevated levels of manganese on a site by site basis, it is necessary to present a complete picture of manganese concentrations detected at each site. Please revise the Manganese Plan to include tables of manganese concentrations detected at each site. Please include analytical results from the remedial investigation (RI), as well as all of the data collected during excavation or pre-excavation

activities. In addition, please include figures of each site showing the locations and results of manganese in soil samples, including changes in concentration with depth.

4) No sampling procedures, sample preparation procedures, or analytical procedures are presented in the Manganese Plan. In order to ensure the comparability of the data presented in the Manganese Plan, and to ensure that the data are of good quality, it is necessary to include information on the sampling, sample preparation, and analytical procedures. In particular, EPA would like to verify that the sample preparation and analytical procedures for the soil samples and the rock fragments were the same. Descriptions of the sampling procedures should include how and when the rock fragments were separated from the soil matrix, and the range of particle sizes that were subject to analysis when rock fragments were isolated by sieving.

5) The Navy states in Section 2.1 that during construction of HPS, bedrock was excavated and placed as fill. The Navy also asserts in the Manganese Plan that the excavated material is the source of elevated concentrations of manganese at Parcel B. However, the Navy has not provided any chemical data on the composition of source materials for the fill at HPS. Of the 34 basalt/chert rock fragment samples analyzed at Parcel B, only nine contained manganese at concentrations greater than the manganese cleanup goal. If it is known where material was excavated for use as fill, please provide analytical results for this source material. If bedrock/weathered bedrock was excavated at HPS, please provide manganese concentration data for bedrock and weathered bedrock samples from uncontaminated sites at HPS. Further, it is EPA's understanding that fill used at Parcel B was also imported from offsite, possibly the Sierra foothills. This was one of the factors that the Navy cited to support its conclusion that elevated radionuclides detected in Parcel B soils was ambient and not due to Navy contamination (see 8/30/94 Radium Report, Parcel B Soils).

6) The Manganese Plan does not discuss the influence of weathering, biological activity, groundwater or soil processes on the distribution and concentration of manganese postulated to be derived from the native material at HPS. These secondary mechanisms may play an important role in the distribution of manganese at HPS. For example, are any of these processes thought to be responsible for the large cluster of high manganese concentrations at Parcel C at depths of 10 feet or more?

Specific Comments

1. **Section 2.1, Native Manganese at Hunters Point Shipyard, page 2:** The Manganese Plan states that rock types such as shale and serpentinite generally contain lower concentrations of manganese than chert and basalt and refers the reader to Table 1. However, only a single data point is presented for the manganese concentration of shale at HPS (1,212 mg/kg, location unknown) and no manganese concentration data for serpentinite is presented on Table 1. Please revise Table 1 to include manganese concentration data for serpentinite rock types. If available, manganese concentrations from multiple shale, serpentinite, and other HPS rock types besides chert and basalt

should be provided.

2. **Section 2.1, Native Manganese at Hunters Point Shipyard, page 2:** The Manganese Plan does not provide specific manganese concentration data for samples collected in the area near the Railroad Museum. The Manganese Plan states that "many of the samples with high manganese concentrations were taken from soil units described in boring logs as having chert or basalt clasts", however, the names of the borings, boring locations, sample depths, and the manganese concentrations of specific samples are not described. Please provide a table listing the samples collected, depth collected, manganese concentration, and the soil description for samples near the Railroad Museum. In addition, please provide a discussion regarding past industrial activities that may have taken place near the Railroad Museum and the possibility that these activities may have influenced the manganese concentrations detected in the area.

3. **Section 2.2, Native Manganese at Parcel B, page 2.** In Section 2.2, The Navy states that manganese exceeds the ambient value (1,400 mg/kg) at eleven remediation areas at Parcel B and that the remediation areas are depicted on Figure 1. However, Figure 1 identifies twelve excavation sites at Parcel B. In order to clarify which remediation areas have manganese as the only contaminant exceeding cleanup goals, please provide a list of the remediation areas in Section 2.2. It would also be helpful to include a more detailed figure of Parcel B that shows the remediation areas in question and the locations and depths of samples that exceeded the manganese cleanup goal.

4. **Section 2.2, Native Manganese at Parcel B, page 4.** The data presented by the Navy in Table 2 does not support the conclusion in Section 2.2 that high concentrations of manganese in fill are naturally occurring and are derived from the naturally high manganese concentrations in chert and basalt. Only nine of the 34 basalt/chert rock fragment samples analyzed at Parcel B contained manganese at concentrations greater than or equal to 1,400 mg/kg. Please revise the Manganese Plan to remove this conclusion or alternatively, please provide additional evidence that elevated concentrations of manganese in fill is from a naturally occurring source.

5. **Section 2.2, Native Manganese at Parcel B, page 3.** The Manganese Plan states that rock fragments from one sample (B4217) did not show high manganese concentrations. However the data on Table 2 show that six out of the fifteen confirmation samples contained rock fragments with manganese concentrations below the cleanup goal. The additional samples are 2302N3B, 2401W3A1, 2408S2A, 2408W1A, and 3229N1A1. Please revise Section 2.2. to indicate that six confirmation samples at Parcel B contained rock fragments with concentrations of manganese less than 1,400 mg/kg.

6. **Section 2.3, Association Between High Native Manganese and Obvious Visual Characteristics, page 4.** No supporting data is presented for the Navy's assertion that surface samples collected from basalt outcrops in Parcel A taken within several inches of each other have widely varying manganese concentrations. The sample names and locations are not provided. Analytical methods for the manganese analysis are not

described and analytical results are not provided. Please revise the Manganese Plan to provide this missing data.

7. **Section 3.0, Screening and Implementation Plan for Manganese at Parcel B, page 4 and 5.** The statement that many samples that have high manganese concentrations were from soil borings logged during the RI as having chert or basalt clasts is not supported in the Manganese Plan. While confirmation sample data presented in Table 2 indicate that chert and basalt fragments are present in soil samples with high manganese concentrations, no evidence is presented to demonstrate that RI soil samples that had elevated manganese concentrations contained chert or basalt clasts. Please revise the Manganese Plan to include a summary of the numbers of soil samples that contained manganese concentrations that exceeded the cleanup goal and whether or not the boring logs for these samples indicated that chert and/or basalt clasts were present at the same depth from which the sample was collected.

8. **Section 3.0, Screening and Implementation Plan for Manganese at Parcel B, page 5.** The Manganese Plan suggests that samples collected from within one foot of other samples at HPS may have a significantly different manganese concentrations. It appears that this pattern is discussed in relation to its occurrence in fill materials, yet natural variation in manganese concentrations in geologic materials is cited as a significant cause. The process of cutting, transporting, and eventually placing fill in an area would be expected to have a homogenizing effect on the distribution of materials within the fill. Please revise the Manganese Plan to address the homogeneity of the fill material. The homogeneity of the fill should be described at a scale adequate to support the argument that heterogeneities in the fill are responsible for the measured differences in manganese concentrations in collocated samples.

9. **Section 3.0, Screening and Implementation Plan for Manganese at Parcel B, page 6.** The statement that "...manganese associated with manganese-only excavations is solely a consequence of naturally occurring manganese associated with chert or basalt clasts" may be misleading, considering the potential influence of the naturally-occurring manganese in finer-grained materials on manganese concentrations in soil at HPS. Because the clasts may not be the most significant influence on manganese concentrations in soil samples, the Navy's proposed screening plan may not be appropriate for use at HPS. Please revise the Manganese Plan to address the relative contribution of finer-grained materials and clasts to the manganese concentrations in soil samples at HPS. If finer-grained materials are responsible for a significant contribution to the manganese concentrations, and especially if they are more responsible than clasts, please revise the screening tool, if possible, to account for the presence of naturally occurring manganese in the fine grained fraction of the materials at HPS.

10. **Table 1, Manganese in Rocks of the California Coast Ranges and at Hunters Point Shipyard, page 8.** The Navy has not provided enough information in the Manganese Plan to evaluate the manganese concentration results for rock samples collected at HPS. First, it is unclear if Part B of Table 1 is a complete list of rock analyses at HPS. The

Navy does not indicate whether the samples listed in Table 1 were collected during the RI or specifically for the manganese screening study. Second, a figure indicating sample locations is not provided. It is not possible to draw any conclusions regarding the average composition of bedrock at HPS without knowing where the samples in Table 1 were collected, or the rationale for why only 18 samples were analyzed. Lastly sample collection, preparation, and analytical methods are not described in the Manganese Plan. It may not be possible to compare analytical data in Table 1 to the results in Table 2 if sample collection, preparation, and analytical methods are different than the methods used in the manganese screening evaluation. Please revise the Manganese Plan to provide a complete list of rock analyses at HPS, a figure showing where the samples in Part B of Table 1 were collected, and the sample collection, preparation, and analytical methods.

11) **Table 1.** The manganese concentrations for published analyses of California Coast Range samples that are reported in Table 1 appear to have been calculated incorrectly. Based on a review of the reference "Franciscan and Related Rocks..." by Bailey et. al. (1964), the manganese concentrations reported on the first page of Table 1 are actually concentrations of manganese reported as an oxide (MnO). It is not possible to directly compare concentrations of manganese reported as an oxide with manganese concentrations. The MnO concentrations are almost 30% higher than the corresponding elemental manganese concentrations. As such, Table 1 overestimates the range of manganese concentrations from published analyses. Please revise Table 1 to present manganese concentrations instead of concentrations of manganese reported as manganese oxide concentrations. In addition, please indicate how the manganese concentrations for the bedrock samples presented in Table 1 were calculated, to ensure that all results in the Manganese Plan are comparable.

12) **Table 1, Manganese in Rocks of the California Coast Ranges and at Hunters Point Shipyard, page 8.** It is unclear why averages and ranges of manganese concentrations are presented in Table 1, unless the individual analytical results were unavailable. It would be more helpful to present the individual concentrations of samples rather than averages and ranges, because some of the ranges may be skewed toward the low end or high end. Please revise Table 1 to include manganese concentration results for individual samples, if they are available, along with the average concentration for the locality.

13) **Table 1, Manganese in Rocks of the California Coast Ranges and at Hunters Point Shipyard, page 8.** Table 1 does not contain all of the sample analyses presented in the references. For instance, the manganese concentrations presented from Bailey et. al. (1964) are only for basalt, chert, and shale interbedded with chert samples collected in San Francisco. Bailey et. al. (1964) contains additional analyses of these rock types that are not included in Table 1. Table 4 in Bailey et. al. (1964) contains 15 analyses of basalt samples in or near the San Francisco Bay area, however, Table 1 lists the manganese concentrations of only two samples. Of the 15 basalt analyses, eleven have manganese concentrations that are less than 1,400 mg/kg. Table 9 in Bailey et. al. (1964) contains seven analyses of chert samples in or near the San Francisco Bay area, however, Table 1

lists the manganese concentrations of only three samples. Of the seven chert samples, four have manganese concentrations that are less than 1,400 mg/kg. Also, no manganese concentrations are presented for serpentinite samples. Manganese concentrations of serpentinite are important because there is a large body of serpentinite located south of Parcel B. Please revise Table 1 to include manganese concentration results for all samples near the San Francisco Bay area that are included in the publications referenced in Table 1. Also, please revise Table 1 to include manganese results of serpentinite samples.

14) **Figure 2, Decision Flowchart for Manganese Screening Parcel B Remedial Action.** The flowchart depicted on Figure 2 is not an appropriate decision making tool. The flowchart inappropriately uses the presence of basalt/chert rock fragments to decide whether a manganese-only excavation should be excavated. The flowchart examines confirmation soil samples that contain manganese at concentrations exceeding 1,400 mg/kg, and if rock fragments from the soil sample contain manganese at a concentration greater than 1,400 mg/kg, then no further action is taken. The relationship between high manganese concentrations in soil samples and the presence of chert/basalt fragments has not been adequately demonstrated in the Manganese Plan, and it is even less clear that this is a one-to-one relationship (i.e. if manganese is present in the rock fragments above 1,400 mg/kg, then manganese will be present in the soil at a concentration above 1,400 mg/kg). Additionally, the criteria for no further action for an excavation site appears to be the presence of even one basalt/chert rock fragment For example, the flowchart indicates that no further action should be taken at Site 24-8, but only one of eight rock fragment samples collected at Site 24-8 contained manganese greater than 1,400 mg/kg. The one rock fragment at Site 24-8 that exceeded the cleanup goal contained 1,500 mg/kg of manganese. Please revise the Manganese Plan to provide more conservative criteria for evaluating whether or not excavate the manganese-only excavations. These criteria should be clearly supported by data presented in the Manganese Plan.

References

Bailey, E.H., W.P. Irwin, and D.L. Jones. 1964. "Franciscan and Related Rocks and their Significance in the Geology of Western California." California Division of Mines and Geology Bulletin 183. 177 pages.