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Re: Comments on Draft RI/FS and Radiological Addendum for Hunters Point Shipyard Parcel E2

Dear Messrs. Forman, Pearce and Ms. Kito:

Please accept these comments on the Navy's draft Remedial Investigation and Feasibility Study ("DRI/FS") and the Radiological Addendum ("Rad Addendum" or "RA") for Hunters Point Naval Shipyard Parcel E2. Although we appreciate the Navy's work to date and the preparation of documents providing an historical and chronological overview of both the site itself and remediation studies which have been performed there, it is apparent that the Navy remains fixed on a preconceived outcome for remediation of Parcel E-2 – preservation in place of highly toxic waste. The documents do include many figures, tables, and appendices presenting useful information to the public and the Navy as it moves toward an ultimate remediation decision. However, the evidence presented in the reports does not support the use of either a presumptive containment remedy or adequately support and explain the relative risks of that option compared to complete excavation. Based on the information at hand, the only long-term goal that would protect both the residents and future users of Parcel E-2 and the adjacent San Francisco Bay is complete excavation. If any presumption is appropriate, it should be complete excavation coupled with off-site containment in a Class I hazardous waste facility that will contain and monitor the highly hazardous wastes in perpetuity.

We understand that these are only preliminary documents and that more versions are to follow. Among other things, the report is still missing critical information about groundwater containment and landfill gases. The Navy must conduct further studies

about current conditions to develop a more complete understanding of the site before it can release a final RI/FS.

We hope that these comments will shape the future versions of the RI/FS and that the Navy will change its overall approach in its consideration and evaluation of remedial options for Parcel E-2. The document is heavily biased in its analysis against environmental solutions that reflect an overall lower risk. It appears that by this bias, non-removal options are more acceptable despite the likelihood that in the long run these options are more expensive and will expose adjacent residents and users of the property to a greater and continuing hazard.

The Navy ought to take a path to maximize long-term protections of human health and the environment. As described in the cleanup standards section of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), the remedial action selected must be one "that is protective of human health and the environment, that is cost effective, and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable." (42 U.S.C. § 9621(b)(1)). The Hunters Point community has paid enough over the decades for the Shipyard's activities in terms of its health, quality of life and anxiety over the legacy of pollution that continues to this day. At Parcel E-2, that legacy needs to come to a clear – and clean – end by excavating and removing the hazardous landfill and providing for its truly contained and monitored disposal.

Having had an opportunity to review the DRI/FS and Rad Addendum, as well as numerous other relevant documents, we believe that the Navy's use of a presumptive remedy at Parcel-E2 is in error. Alternatively, significant portions of the draft analyses are not supported by the available evidence.

A. The Draft RI/FS is Missing Critical Information.

The Draft RI/FS report lacks a formal assessment of the ecological risk assessment to aquatic receptors for exposure to groundwater. Given the proximity of the site to the Bay and the current and future use of Yosemite Slough and other adjacent shoreline areas for recreational and subsistence fishing, the remediation selection process is fundamentally flawed by the omission of risks associated with groundwater transporting contaminants to the Bay and anglers. The chemicals of concerns and risk-based remediation goals pertaining to this assessment were not available in the preliminary RI/FS. (DRI/FS Section 7.3) Because a method to compare groundwater data to aquatic criteria has not been established, the RI/FS was unable to establish remediation goals for groundwater discharges to the Bay. (DRI/FS ES.5.1). Thus, groundwater containment options were not included in any of the proposed remedial alternatives. (DRI/FS ES.5.3.).

In a similar fashion, landfill gas treatment/destruction options were not included in the proposed remedial alternatives because additional data is needed. *Id.* Like the

initial omission of the Rad Addendum, the omission of a risk assessment for exposure to contaminated groundwater from the site as well as risks associated with landfill gasses makes it impossible for the Navy to justify a presumptive remedy attempting purporting an ability to contain the Bay-side landfill.

B. The Navy Incorrectly Applied the Containment Presumptive Remedy.

Contrary to the Navy's assertion in the DRI/FS, the Parcel E-2 Landfill does *not* "meet all of the criteria specified in EPA guidance for application of the containment presumptive remedy." (DRI//FS Executive Summary ("ES")-13).

1. Parcel E-2 is not a typical military landfill.

Parcel E-2 is not a typical military landfill and the Navy should not utilize the presumptive containment remedy EPA has designed for municipal landfills for this industrial, *de facto* hazardous waste landfill. The EPA guidance, "*Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills*" ("*EPA Presumptive Application*") is only appropriate for sites that are similar to municipal landfills.

The record of past activities at HPS and at Parcel E-2 distinguishes the site from a municipality or a typical military base consisting of military personnel, barracks, and storage. HPS' history is replete with examples of industrial activities that produced hazardous wastes. These activities included over 100 years of shipbuilding, over 115 years of ship maintenance and retrofitting, and over 20 years as a Naval Radiological Defense Laboratory. Parcel E-2 was created as a landfill accepting a variety of waste, including hazardous industrial waste. (DRI/FS ES-2). In addition to the Navy's own radiological and other industrial activities, for over ten years, the property was leased to Triple A Machine Shop, Inc. who "allegedly generated and disposed of hazardous substances" throughout Parcel E-2. (DRI/FS 1-12). Triple A disposed industrial waste including, for example, industrial debris, sandblast waste, and oily industrial sand in, among other areas of Parcel E-2, the Landfill Area, and also "allegedly stored unlabeled, deteriorating, uncovered drums with their contents exposed to the elements in the southeast portion of Parcel E-2." (DRI/FS ES-2, 1-13).

In distinguishing how such activities at a military landfill are different from a typical military landfill, the *EPA Presumptive Application* recognizes the potential for a site like Parcel E-2 to contain a high percentage of industrial and hazardous waste: "some military facilities (e.g. weapons fabrication or testing, shipbuilding, major aircraft or equipment repair depots) have a high level of industrial activity compared to overall site activities. In these cases, there may be a higher proportion and wider distribution of industrial (i.e. potentially hazardous) wastes present than at other less industrialized facilities." (p.3). This is plainly the case for classifying Parcel E-2—it primarily consists of a landfill where industrial and potentially hazardous waste have been discarded from a

variety of past industrial activities. Thus, the evidence shows that Parcel E-2 is not a typical military landfill for which the containment presumptive remedy is appropriate.

2. The site-specific characteristics of Parcel E-2 are not appropriate for a containment presumptive remedy.

The presumptive remedy is not appropriate given the site-specific circumstances of Parcel E-2. As stated in the *EPA Presumptive Application*, "[s]ite-specific circumstances dictate whether a presumptive remedy is appropriate at a given site." (p.1). In this case, the landfill's proximity to the Bay, its high water table, its location in one of the world's most seismically-active areas subject to liquefaction, rising sea levels (*see below*), and its hazardous contents are all critical site-specific circumstances that, pursuant to *EPA Presumptive Application*, preclude the application of a presumptive municipal landfill remedy.

EPA Presumptive Application notes expressly that the presence of high water tables, wetlands and other sensitive environments can limit the use of the containment presumptive remedy at a military landfill. (p.3). Parcel E-2 has a very shallow water table and is subject to extensive interaction with the San Francisco Bay environment. The containment remedy proposes to disturb wetlands during the construction of the containment systems. A cap on top of the landfill only keeps water from penetrating from above; it does nothing to prevent the bathing of hazardous waste with water from below, and the migration of those soluble chemicals into the waters of the State. That migration has already been well-documented from Parcel E-2. Man-made coffer dams have proven ineffective. The Navy has not considered these environmental factors and how they might limit the use of the presumptive remedy.

Perhaps the key site-specific characteristic is the nature of the waste in the landfill of Parcel E-2. The Navy must adequately characterize this waste and consider this in its selection of remedies. Instead, the Navy has relied on EPA guidance for a presumptive remedy which permits the Navy to skip the critical step of analyzing the solid waste in selecting a response action. The DRI/FS states that

> [t]he nature and extent of solid waste and chemicals in soil within the Landfill Area is adequately characterized in order to evaluate a focused set of remedial alternatives in the FS. This determination is based in large part on EPA presumptive remedy guidance for CERCLA landfills (EPA, 1994; EPA, 1996). Consistent with EPA guidance, *characterization of the solid waste is not necessary* or appropriate for selecting a response action for the Landfill Area.

(DRI/FS ES-5) (emphasis added). Given the history and types of industrial activities at the Shipyard and the nature of the wastes discarded at the landfill, the absence of a robust characterization is inappropriate.

The presence of radioactive waste within the landfill precludes the rational application of *EPA Presumptive Application*. Radioactive waste is not an anticipated waste in a municipal landfill. The RI/FS fails to integrate the description of radionuclides of concerns ("ROCs") in the landfill and other portions of Parcel E-2. The Rad Addendum is presently a separate document and is not effectively incorporated in the remedial alternatives. Moreover, the Rad Addendum has not adequately characterized the radioactive waste within the Landfill Area. (*see* Rad Addendum section *infra*).

Thus, Parcel E-2 in not a situation for which the presumptive remedy has typically been used, when there are "[w]astes that pose a relatively low long-term threat and where treatment is impracticable." (Draft RI/FS 1-6). Here, there are ROCs present throughout Parcel E-2 which have a long half-life and carry a great risk to both human health and the environment in the proximate area. While Parcel E-2 is designated for open space re-use, the long-term land use plan for the adjacent parcels of HPS is likely to involve fairly heavy use, including a potential stadium, numerous residential areas, and urban parks. Given the population increases and use increases expected for the area, an excavation remedy would provide necessary flexibility for future land uses. Once the Navy integrates the site-specific information from the Rad Addendum into the RI/FS, it should be clear that Parcel E-2 is not a site that is appropriate for the containment presumptive remedy. Even if the site was fenced-off in perpetuity, which would be necessary if the radiological waste was left in-place, the waste in the landfill would continue to impact both the adjacent land-uses and the adjacent waters of the State. Moreover, leaving a toxic landfill in the midst of these other adjacent land-uses would most certainly depress property values for the long-term future.

3. The Navy should do a conventional RI/FS and take a closer look at the excavation alternative.

The Navy should abandon any elements in its analysis relying upon a presumptive remedy and instead should conduct a conventional RI/FS. Since the presumptive remedy process involves streamlining the RI/FS, which means only looking at the components of the presumptive remedy and the no action alternative, the Navy only analyzed the excavation alternative to support the community's review of potential remedial alternatives. That is completely inappropriate. As the *EPA Presumptive Application* states, "[i]f excavation of the landfill contents is being considered as an alternative, the presumptive remedy should not be used." (p.6). Parcel E-2 is a complex site which contains a variety of wastes, including radioactive wastes, decontamination materials, PCBs, VOCs, and heavy metals. The reliance on the presumptive containment remedy resulted in a DRI/FS that is biased towards containment and gives short shrift to the excavation alternative. The Navy ought to discard the presumptive containment remedy and instead use a conventional RI/FS to take a detailed look at appropriate remedies that will be truly protective of human health and the environment. It appears that Alternative 2, the excavation remedy, is the one alternative being considered capable of achieving this essential goal.

4. Even assuming that the Navy's application of a presumptive remedy is permissible, the Navy has not presented sufficient information about the nature of the proposed landfill cap.

The Draft RI/FS and the Rad Addendum lack sufficient information about the nature of the cap that pertains to Alternative 3. The documents do not describe the material for constructing the cap, the lifespan of that material, or estimates about required maintenance beyond a period of 32 years (*see* Table 13-1). At the June 14, 2007, Technical Subcommittee Meeting of the Restoration Advisory Board, the Navy suggested that it would use a 60 mil Herculine HDPE barrier manufactured by In-Line Plastics, Inc. It suggested that the life of such a barrier would be 100-400 years, and that, in terms of institutional concerns, maintenance would be the biggest concern. None of these facts were in the Draft RI/FS and they do not appear in the Rad Addendum.

There are problems with this choice of cover. Reviewing a link from the In-Line Plastics website (http://www.in-lineplastics.com/Herculine1.pdf), which sets forth test results reported by the supplier of the high-density polyethylene resin used to manufacture In-Line's Herculine, it appears that the material may encounter some attack from some of the wastes present in Parcel E-2. Specifically, Herculine is listed having limited application or unsatisfactory compatibility with respect to chlorine gas, benzene, and carbon disulfide. All of these materials exist within Parcel E-2. Of course, it should not be up to the reviewing public to analyze the composition of any proposed cap. That is the Navy's job. Currently, the proposed documents fail to provide any information on this critical component of the Navy's Alternative 3

A 32-year analysis does not include future costs of maintaining and possibly replacing the cover due to erosion and other environmental factors that affect the life of the cover. Moreover, as the cover begins to disintegrate, there may be serious consequences to human health and the environment given the contaminants present in the landfill. It is known that there are radioactive materials present that have very long half-lives, certainly lives that will outlast any geosynthetic cap. A thorough description of the proposed landfill cover and evidentiary support of its efficacy is essential to the Navy's rational selection of a remedial action.

Finally, as stated above, a cap on top of the landfill does not address the high water table, the bathing of soluble hazardous waste with rising groundwater, nor the migration of the resulting "toxic soup" into the groundwater and the waters of the State. With water tables rising as a result of global warming, the reality is that this low-lying former wetland parcel may eventually find itself underwater. *See infra*. The Navy's analysis does not even mention this eventuality.

C. The Rad Addendum is inadequate and incomplete.

The bias against the excavation option also is seen throughout the Rad Addendum. This section of the comments presents some of the deficiencies that are particular to the Rad Addendum and its appendices.

1. The Navy has failed to adequately characterize the nature of the landfill.

The Rad Addendum shows that further tests must be done before the Navy can truly know the constituency of the Parcel E-2 Landfill. The report describes a history of ROCs throughout all of the major portions of Parcel E-2. (See Table 3-1, 4-1, 4-2). Despite the removal actions of certain "Hot Spots," many ROCs are still present in Parcel E-2 and will remain in the ground should the Navy select Alternative 3. For example, in Section 13.2.5 of the Draft RI/FS, the Navy recognizes "the uncertainty of waste types found in the landfill." The following excerpts demonstrate the need for better understanding of the nature of the landfill.

"During the course of the excavation activities within the excavation boundary, large deposits of metal and drums were encountered at various locations and depths. Drums were in various conditions upon discovery, ranging from crushed and deteriorated to rusted but structurally sound and holding contents. Substances contained in unearthed drums ranged from petroleum products (oil, diesel, grease, and waste oils) to insulating foam. Some unearthed drums contained contents that could not readily be identified." (RA 8-1)

"Low-level radioactive waste generated from the site included 533 cubic yards of soil and firebrick, 78 cubic yards of metal debris, 43 devices and/or button sources, and 19 pieces of debris. Two low-level mixed waste lab-pack drums of bottles and containers with unknown chemical constituents were also generated." (RA 8-2)

"In addition, 163 point sources and pieces of radioactively contaminated debris were removed during the excavations at Metal Debris Reef/MSA." (RA 8-3)

Reason dictates that the same types of wastes likely will be encountered in other areas of the landfill. A more thorough characterization of radioactive waste within the landfill must be conducted in order for the Navy to be allowed to leave it in place in perpetuity.

2. There are substantial shortcomings with the risk modeling and the risk assessment in the Rad Addendum.

The risk modeling is scientifically unacceptable and results in a severe understatement of the risk from any non-removal option. The approach taken to "combine" chemical and radiological risk requires the use of unsubstantiated

manipulation input to the RESRAD code and leads to miscalculations of radiological risk. Two other California sites; Whittaker Bermite (former explosives and munitions site) located near Los Angeles, and Santa Susana Field Laboratory (Department of Energy site which designed and conducted nuclear reactor experiments) located in Ventura County, initially used similar approaches and state radiation regulators have viewed such approaches as inadequate and required the preparers of such documents to conduct additional risk modeling. The modeling is also unacceptable in that if fails to articulate and consider erosion, disturbances of contamination and cap, and institutional controls. The Navy should review the modeling conducted for those sites, adjust the modeling to fully address concerns arising from the containment alternative, and redo the risk modeling for Parcel E-2.

Section 7.3 ("Uncertainty Analysis for Critical Assumptions") appears to adequately address uncertainty of some of the critical assumptions; however, the most critical is the input of ROC levels and distribution. It seems that simplifying assumptions of clearance levels are used for the modeling, which assumes that the contaminant levels are at the clean-up levels. The report fails to indicate whether the contaminant levels are at the clean-up levels. It does not document this and does not make this clear in the report.

The risk modeling and assessment do not adequately describe the distribution of contamination. It fails to indicate whether it is homogeneously dispersed or whether there are stratigraphic variations such that pockets of higher concentrations of contaminants exist in specific locations. If it is not homogeneous, the report does not indicate how input values are averaged, the basis of the averaging, and whether uncertainty analysis has been conducted on any assumptions pertaining to this analysis.

Section 8.0 ("Remedial Investigation Summary and Conclusion") describes removal actions within Parcel E-2 and appears to represent the best direct evidence of the nature of the Radiological contamination. It is clear that significant radiological contamination has been discovered in "Hot Spots" or discrete locations within the landfill. The modeling input appears to be an average distributed concentration (1.5 pCi/g Radium). This direct evidence contradicts the assumptions being used for risk modeling—namely that the composite of the landfill is homogenous, when studies mentioned in the Rad Addendum (including the above excerpts) indicate a diversified landfill constituency. The Rad Addendum presents no rationales for failing to tailor their risk modeling accordingly.

Appendix A, which describes the Radiological Risk Screening Analysis, indicates that the recreational adult scenario is the critical exposure scenario. This analysis, which describes the appropriate amount of cover over the impacted soil area to minimize cancer risks, appears to presuppose a containment option. There is not an adequate analysis of the construction worker scenario, which would be an integral analysis in evaluating the excavation alternative. The Navy has not completed a complete analysis of the excavation alternative.

In Appendix A, Section 2.1.3 ("Exposure Frequency and Exposure Time"), the report does not indicate the input assumption for exposure frequency and time in hours per year for the modeled scenarios.

3. The Rad Addendum fails to comply with require with National Regulatory Commission (NRC) requirements.

The most widely used modeling code for residual radioactivity in the environment is RESRAD. The RESRAD code uses an erosion rate of 1 mm/yr. Although the erosion rate may vary, some erosion rate is inevitable and a basis for the rate should be provided. In the case of the Parcel E-2 model, even limited erosion impacts the later-year dose substantially. Surely the Navy must incorporate natural soil erosion in an area designated for open reuse. Since external radiation is the primary dose driver, erosion of the cover can have a very significant impact over the required 1,000-yr NRC window (versus the shorter EPA window). (*see* 10 Code of Federal Regulations ("CFR") § 20.1401(d)). The usage of lower than required erosion rates in this instance leads to misleading results that in turn reduces the credibility of the document.

Section 7.3 notes that the NRC limit on future dose is 25 mrem/yr. While this is the correct NRC limit, it is incorrect by omission since it fails to note that the criteria also includes a requirement that future site user dose be ALARA ("as low as reasonably achievable"). The NRC requires a formal process to prove this, not the subjective language used in this document. (10 CFR § 20.1402).

Section 13.3.3 discusses long-term maintenance and monitoring of a cap for Alternative 3. This is usually not acceptable from an NRC standpoint because it is not clear who will be around in a thousand years to actually make this happen. Similarly, Alternative 3 uses deed restrictions. The NRC normally will not accept this as a durable control for unrestricted release of a property. (The current NRC position on this matter is that NRC licensees will not be released from license control (license termination) under conditions similar to Alternative 3 for Parcel E-2 but will convert the operating license to a "long-term control" license. NRC Policy Issue SECY-06-0143). This is especially true for Parcel E-2 given the potential value of the site once the area's development plans are fully realized.

4. The Rad Addendum fails to modify the Remedial Alternatives in a way that reflects the contents of Parcel E-2 and results in an inconsistent evaluation with respect to the Draft RI/FS.

The Rad Addendum modifies Alternatives 2 and 3 in essentially the same fashion – it adds excavation and off-site disposal of radiologically-impacted soil associated with the excavation and removal of the storm drain and sewer lines; a survey, excavation and off-site disposal of the berm located at the experimental ship-shielding area, and; institutional controls (including covenants to restrict use of property) that would be

implemented across the entire parcel to prevent exposure to radionuclides of concern. The additional cost of each additional remedial option described in the Rad Addendum is identical because the proposed remedies are identical. (See RA Appendix B). This proposal does not address the radioactive and other hazardous materials contained in the landfill portion of Parcel E-2. (See RA Table 4-1). For example, Alternative 3's containment remedy with respect to the majority of the landfill is unaltered pursuant to the Rad Addendum. The radiologically-impacted materials will simply be left in place, untreated, and covered. In addition, it is unclear why additional excavation is required for Alternative 2; the assumption in the Draft RI/FS is that Alternative is a total excavation. The Navy has not explained this discrepancy.

The Navy has not explained the Rad Addendum's effect on the Draft RI/FS. It is unclear whether the documents are integrated. It seems that the Rad Addendum incorporates and adds to the Remedial Alternatives presented in the Draft RI/FS. Given that the Rad Addendum adds essentially the same remedy for radionuclides to both alternatives, one would expect that it would modify the comparative analysis of remedial alternatives in exactly the same fashion. A side-by-side comparison of the comparative analysis for remedial alternatives in the Draft RI/FS (DRI/FS ES-15) and the same analysis in the Rad Addendum (RA ES-6) reveals that this is not the case. For example, the ratings for implementability and long-term effectiveness both increase for Alternative 3 while remaining the same for Alternative 2. The Navy does not provide an explanation for this shift in its comparative analysis of remedial alternatives. It is further evidence of the bias towards the containment remedy at the expense of the future residents and users of the area within and surrounding Parcel E-2. The Navy should integrate the information in the Rad Addendum and calculate the real costs that are necessary to handle radioactive material and provide a proper comparison between a containment proposal and excavation.

D. Evaluation of the NCP Criteria.

The remainder of these comments addresses the nine National Contingency Plan ("NCP") criteria upon which the remedial alternatives for a CERCLA cleanup action are evaluated. The NCP criteria include two threshold criteria: overall protection of human health and the environment and compliance with the Applicable or Relevant and Appropriate Requirements ("ARARs"). The five balancing criteria include long-term effectiveness and permanence; reduction of mobility, toxicity, or volume through treatment; short-term effectiveness; implementability; and cost. The two modifying criteria are state acceptance and community acceptance.

In terms of the two threshold criteria, Alternative 2 is far more protective of human health and the environment than Alternative 3, and Alternative 3 does not comply with all of the ARARs. The threshold balancing criteria are discussed accordingly below. The comments address both the Draft RI/FS as well as the Rad Addendum.

1. Alternative 2 is the superior alternative for overall protection of human health and the environment.

The first threshold criterion is overall protection of human health and the environment. The conclusions in the Draft RI/FS and the Rad Addendum clearly show that the excavation alternative is far more protective of human health and the environment than the containment alternative. According to Draft RI/FS Figure 14-1, the figure in the final section of the report which summarizes the Navy's overall comparative evaluation of the remedial alternatives, Alternative 2 "[w]ould eliminate potential exposure of receptors to contaminated solid waste, soil, or sediment through direct contact or inhalation; [w]ould reduce or eliminate landfill gas generation and migration; [and] [w]ould remove potential sources that could contaminate groundwater and surface water." On the other hand, the figure notes that Alternative 3 "[w]ould prevent human and ecological receptors from direct contact, incidental ingestion, and inhalation of eroded waste particulates; [and] [w]ould prevent exposure to groundwater contamination."

These alternatives are not equal. Excavation would *eliminate* health and environmental risks. Assuming that containment even worked in the first instance, and that it will be properly maintained over many generations, the containment option would merely *prevent* the risks. Excavation is a permanent, concrete solution that will not require nearly the intensive amount of maintenance and follow-up that would accompany a containment remedy. It is unclear whether containment will continue to prevent receptors from contact with contaminants in the future, as the cap deteriorates due to contact with hazardous materials and other chemicals, erosion, and other detrimental factors. A review of the Draft RI/FS and the Rad Addendum does not provide any information on the longevity of the cap. This can be quite harmful in particular with respect to the deleterious effects of ROCs that have lengthy half-lives. Likewise, given the absence of a groundwater risk assessment, the record does not support the Navy's claim that the containment option will prevent exposure of people and the environment to contaminated groundwater seeping into the Bay.

Since Alternative 2 is a permanent solution and will absolutely be protective of human health and the environment, it deserves a high performance rating for this threshold criterion. The Navy does not sufficiently explain how an impermanent containment effort such as Alternative 3, without a maintenance and replacement plan for the future, can possibly be as protective of human health and the environment. At the least, these alternatives do not merit the same evaluation for this criterion.

2. Alternative 3 fails to comply with all of the ARARs

Compliance with the ARARs is the second threshold NCP criterion. As described below, Alternative 3 does not comply with some of the action-specific ARARs in both the Draft RI/FS and the Rad Addendum.

a. Alternative 3 does not comply with the action-specific ARARs for containment in the Draft RI/FS.

The failure of the Navy to analyze the costs of Alternative 3 beyond a period of 32 years raises important questions about the ability of Alternative 3 to comply with several of the action-specific ARARs for containment (*see* Draft RI/FS Section 10.3.1). Table 13-1 of the Draft RI/FS indicates a 32-year period of analysis for two versions of Alternative 3. This time frame barely covers the minimum requirement for post-closure maintenance and monitoring of the landfill and does not reflect the nature of the wastes in the Parcel E-2 landfill:

- Post-Closure Maintenance: 27 California Code of Regulations ("CCR") § 21180(a). This section requires post-closure maintenance and monitoring of the landfill for no less than 30 years following closure.
- Post-Closure Care: 22 CCR § 66264.310(b)(1). This section requires that the integrity and effectiveness of the final cover be maintained throughout the post-closure period.
- Benchmark Maintenance: 22 CCR § 66264.310(b)(5). This section requires that surveyed benchmarks be protected and maintained throughout the post-closure period.

The assumption based on the data in the Draft RI/FS is that the maximum period for post-closure maintenance is 32 years. A review of the Draft RI/FS and Rad Addendum does not provide evidence of how the proposed cap will be maintained beyond this period, or how long such a cap will last. The documents do not account for environmental factors that can affect the efficacy of a cap at that location over a longer period, such as sea level rise and erosion. By failing to account for these factors or describe a longer time period, the Navy has not definitely provided answers for the following ARARs:

- Post-Closure Water Entry: 22 CCR § 66264.310(a)(1). This section requires that the final cover be designed to prevent the downward entry of water into the closed landfill throughout a period of at least 100 years.
- Post-Closure Care Period: 27 CCR § 20950(a). This section requires that the post-closure maintenance period shall extend as long as the wastes pose a threat to water quality.

With respect to the water entry, the Navy has not provided details about the long-term length and/or efficacy of the cap. With respect to the care period, although the groundwater data is not complete (as described above), it appears very likely that if left in place, the wastes will pose a threat to water quality beyond a period of 32 years. It is likely that after 32 years, the containment efforts will be degraded from their original condition, warranting continued and perhaps additional monitoring. Likewise, sea level is expected to rise during that time period and contact between the landfill and the Bay environment will increase over time, well beyond the first 32 years. Since Alternative 3

has a short period of post-closure maintenance, it does not comply with the above action-specific ARARs. This is not only a failure to comply with the second NCP threshold criterion, but also is an example of why Alternative 3 would not be fully protective of the environment.

b. Alternative 3 does not comply with the federal action-specific ARARs in the Rad Addendum.

A review of the Rad Addendum reveals that Alternative 3 will not comply with at least two of the federal action-specific ARARs that apply to the remedial alternatives for radionuclides. The ARARs in particular are as follows:

- 10 CFR § 61.41: Performance objectives for the land disposal of low level radioactive waste specify that concentrations of radioactive material that may be released to the general environment in ground water, surface water, air, soil, plants, or animals must not result in an annual dose exceeding 25 mrem to the body or any organ of a member of the general public.
- 10 CFR § 61.44: The disposal facility must be sited, designed, used, operated, and closed to achieve long-term stability of the disposal site and to eliminate to the extent practicable the need for ongoing active maintenance of the disposal site following closure so that only surveillance, monitoring, or minor custodial care are required.

Radioactive materials above certain limits must be treated and/or disposed in an NRC regulated facility. This site would in itself never qualify as a potential land disposal unit for regulated hazardous or radioactive waste. Parcel E-2 is an unlined landfill ill-equipped to handle such storage. The Rad Addendum and Draft RI/FS do not provide information on the longevity of the cap and thus do not provide assurances that the containment option will prevent the release of radioactive waste vis-à-vis the half-lives of the ROCs present at Parcel E-2 (or the other landfill contaminants). Full compliance with the NRC regulations is the minimum standard of care owed to the current and future residents of San Francisco. To do any less will short-change future generations that may have to exhume any waste left behind at a greater ultimate cost and with a greater health impact. Excavation would clearly achieve this goal in the near-term to the maximum extent. Containment would require sophisticated monitoring and maintenance over hundreds or perhaps thousands of years. Hence, the containment alternative for the Parcel E-2 will never comply with 10 CFR § 61.44, which requires a facility to "achieve long-term stability" and requiring only "surveillance, monitoring, or minor custodial care." In addition, given the lack of data relating to groundwater releases and Bay influences on the landfill, including sea level rise, there is no way the Navy can demonstrate that the Parcel E-2 landfill will ever satisfy 10 CFR § 61.41's exposure criteria. Therefore, the Navy has not shown that Alternative 3 complies with the ARARs and meets this second threshold criterion.

c. The Navy makes mistakes in evaluating the ARARs for the Rad Addendum.

Section 10.1.3 of the Rad Addendum notes that California state requirements (17 CCR § 30253) are not more stringent than federal ARARs at 10 CFR Part 20. Therefore, the state requirements are not potential ARARs. This is not true. The Navy ought to present a comparison of the state requirements vis-à-vis the federal ARARs and explain why it believes the state requirements are not more stringent. Presently, there is no support for this assertion in Section 10.1.3.

d. Figure 14-1 shows that Alternative 3 does not comply with the ARARs.

Figure 14-1 is a graph at the end of Section 14, the final section of the Draft RI/FS, that offers a comparative evaluation of remedial alternatives. It indicates that Alternative 2 can meet all of the chemical-specific, location-specific, and action-specific ARARs. However, it indicates that Alternative 3 only meets the chemical-specific and location-specific ARARs. It does not indicate that Alternative 3 can meet all of the action-specific ARARs. We believe Figure 14-1 represents the correct compliance with the ARARs, and clearly shows that Alternative 3 does not satisfy the NCP threshold criterion of complying with the ARARs.

3. Alternative 3 should have a higher performance rating for long-term effectiveness than Alternative 2.

The first NCP balancing criterion is longer term-effectiveness and permanence. The Draft RI/FS gives Alternative 2 a moderate to high performance rating for the long-term effectiveness and permanence criterion. (*see* Figure 14-1). There is no evidence in the record to support that conclusion. The Draft RI/FS and Rad Addendum do not present sufficient information about the details of this alternative to make a determination that this remedy will be effective upon completion, never mind for decades and centuries to come. With the containment remedy, rather than removing the risk entirely, caps are used to attempt to control potential exposure, a solution that is far from permanent. As the Rad Addendum notes with respect to the ROCs, "Alternative 3 offers moderate, long-term effectiveness but is *not considered a permanent solution* since the radionuclides are only physically removed from the surface of soil, and from the storm drains, sanitary sewers, and septic system drain lines of Parcel E-2." (RA, ES-4, 5) (emphasis added). Section 13.3.3 of the Draft RI/FS claims that "[w]ith proper maintenance and monitoring, closure of the landfill and adjacent areas would be both effective and permanent in the long-term." The Navy has not provided a plan for this maintenance and monitoring beyond 32 years or otherwise supported that bald assertion. Nothing in the record supports a conclusion that the containment alternative either will be completely effective in the short- or long-term and the Navy acknowledges that it will not be permanent in the long-term.

Moreover, a high potential exists that Parcel E-2 will experience liquefaction during a major earthquake. It is difficult to conclude that a solution that does not involve removing the waste can be permanent solution when the entire landfill might rupture or slide into the Bay during a major quake. Despite the Navy's suggestion that the cap would be designed for earthquake conditions, the Navy presents no data about how this would actually work. It also presents no numerical data about how the cap would manage landfill gas migration into future generations. In short, the Navy does not provide an evidentiary basis for its claim that the containment alternative has a moderate to high performance capability for long-term effectiveness and permanence. It appears to be sacrificing assured protection of health and the human environment in favor of a quicker, short-term solution.

In contrast to the containment option, excavation and disposal is an excellent alternative with respect to long-term effectiveness and permanence. The Navy recognizes this and appropriately rates Alternative 2's performance with respect to this criterion as high. The Draft RI/FS notes that with excavation, "solid waste, soil, and sediment posing unacceptable risk would be *permanently* removed." (DRI/FS 13-5 – 13-6) (emphasis added). Excavation is a permanent, effective solution that maintains the integrity of the surrounding environment as well as the health of future users of the HPS area.

4. Alternative 2 will result in a reduction of toxicity at Parcel E-2.

The second NCP balancing criterion is how the remedial alternative achieves a reduction of toxicity, mobility, or volume through treatment. Alternative 2 will result in a reduction of toxicity, mobility, and volume via treatment with respect to *Parcel E-2 itself.* When evaluating Alternative 2's compliance with this criterion, the Navy points out in Draft RI/FS Section 13.2.4 that the removal actions will not reduce the volume of contaminated media because the material would be transferred to another location, inferring that the contaminants will still exist in the world. However, the Navy does acknowledge that the excavated material would be placed at a licensed disposal facility with engineered containment systems and that some of the material may be treated prior to disposal. The key point that the Navy fails to observe here is that while Alternative 2 may not reduce the toxicity of the contaminated material in the whole world, it will absolutely reduce the toxicity of contaminated material *at Parcel E-2.* This is an enormous boon to the protection of human health and the environment in the local region. The ultimate disposal of waste from the landfill in a contained, engineered hazardous waste disposal facility that is designed to exist in perpetuity is environmentally preferred, especially over a permanent exposure source of under-characterized pollutants to the Bay shoreline and future residents and users.

It is unfair to characterize the performance of both Alternatives 2 and 3 as moderate, when it is apparent Alternative 2 will do more than Alternative 3 to reduce the toxicity of contaminated media in Parcel E-2. As Figure 14-1 shows Alternative 2 will reduce the "toxicity and mobility of contaminants in solid waste, soil, and sediment," in

contrast to Alternative 3, which will purportedly contain the contaminated media, ostensibly restricting its mobility but keeping it at the site. In addition, the Navy does not evaluate the longevity or the long term integrity of the sheet pile wall that will purportedly prevent migration of contaminants into the aquifers and the Bay. Unlike Alternative 2, which will reduce the toxicity of the groundwater, the "[t]oxicity and volume of the contaminated media would not be reduced" with Alternative 3, nor will the toxicity in the groundwater be reduced. Moreover, the Draft RI/FS and the Rad Addendum do not provide sufficient evidence to prove that the containment remedy will even contain the contaminated media at the site into the future, leaving further questions about the efficacy of its usefulness. Since Alternative 2 obviously does more to reduce toxicity, mobility, or volume of the contaminated media, particularly with respect to Parcel E-2 itself, the Navy erred in giving both Alternative 2 and 3 the same moderate performance ratings in the Draft RI/FS.

5. The Draft RI/FS evaluation of the short-term effectiveness of Alternative 2 is unsupported, while Alternative 3 can have future short-term effects.

The third NCP balancing criterion is short-term effectiveness. The Draft RI/FS and Rad Addendum evaluation of the short-term effectiveness of the excavation remedy is unsupported by adequate evidence or discussion. Alternative 2 is given a low performance rating because it presumably would pose risks to both workers and the surrounding community from exposure to dust, noise, and construction traffic, as well as take four years to complete. The Navy's conclusory assessment regarding both the risks and the length of time to excavate the site is not supported with tangible evidence. In fact, the Navy recognizes the potential to minimize the short-term risks associated with excavation: "The potential human health and environmental effects that may be caused by implementation of this technology would be short-term, and could be effectively managed by appropriate health and safety, dust control, and stormwater management procedures. These include windblown dust during excavation, sediment in stormwater runoff, and inhalation of volatile contaminants, such as VOCs. Dust would be controlled through regular spraying with water, and off-site sediment and volatile contaminant migration would be controlled through proper construction techniques and BMPs and verified by site monitoring." (RI/FS 11-39).

The individuals performing the excavation would be trained professionals at handling hazardous waste, and would be taking precautions to protect both their health and the health of the community. A prompt removal action would reduce the on-site costs during the cleanup phase while also greatly minimizing the need for future monitoring. The Navy does not adequately balance this concern for safety with the potential risks, but rather assumes problems in implementing the excavation.

There also could be future, on-going short-term effects in perpetuity each time significant maintenance is performed or when the cover proposed in Alternative 3 needs to be replaced. While Alternative 3 may only take two years to complete, the Navy does

not consider future efforts needed to maintain the cap when considering this criterion. As described below in the cost section, leaving hazardous material in place will require a review every 5-years and may require future action. Future action will translate into future short term effects. Thus, even if excavation takes longer in the immediate future, the containment remedy will continue to disturb the community for indeterminate periods of time each time the cap needs to be replaced or maintained. The Navy has not provided any information regarding these long-term maintenance and replacement activities. Viewed from this perspective, the Navy gave the performance for this criterion an artificially high performance rating for Alternative 3's short-term effectiveness.

The Navy has not provided sufficient support as to why Alternative 2 received a low rating for the short-term effectiveness criterion, another example of the bias toward the containment remedy. The excavation alternative deserves a much higher rating for short-term effectiveness.

6. The Navy mischaracterizes the implementability criterion with respect to both Alternative 2 and 3.

The fourth NCP balancing criterion is implementability. The Navy should give Alternative 2 a higher performance rating with respect to its implementability. Despite giving it a low rating, the Navy recognizes that excavation and off-site disposal is a "common remediation technology that has been successfully implemented at HPS." (DRI/FS 13-7). The Draft RI/FS does not provide sufficient evidence why Alternative 2 should be treated any differently than other areas at the Shipyard that likely had a similar pollution remediation issues to Parcel E-2.

The Navy incorrectly applies the EPA's guidance related to CERCLA municipal landfills when evaluating Alternative 3's implementability and thus gives Alternative 3 an artificially high performance rating for this criterion. (*see* DRI/FS 14-4). As stated above, Parcel E-2 is not like a municipal landfill site and the Navy must make more significant efforts to analyze the methodology that would be used to contain the hazardous waste. It cannot simply rely on the "readily available" prescribed technologies, construction methods, qualified personnel, materials, services, and equipment that can improve the implementability of this remedy.

Although the Navy claims there will be no administrative barriers to Alternative 3, given the presence of radium and other ROCs in the Rad Addendum, the Navy will likely encounter considerable administrative barriers from public agencies such as the DTSC and the City and County of San Francisco, who are concerned about the future well-being of its citizens. This is especially true for San Francisco considering Proposition P, which describes the City's policy regarding the remediation of HPS and what standard of remediation would be acceptable to the community. Since the policy urges "the Navy to clean up [HPS] in a manner that is fully protective of public health and does not rely on future owners to maintain barriers to protect future occupants and the public from exposure to pollution left by the Navy," it is difficult to imagine that the

Navy will not meet administrative barriers in moving forward with Alternative 3. It is very reasonable to expect that Alternative 2 will be welcomed by both the City and DTSC, as it is certainly the option that is completely protective of human health and the environment. There is not sufficient evidence to support Alternative 3's moderate to high performance rating for its implementability.

7. There are various shortcomings with the cost analysis.

The final NCP balancing criterion is cost. The Draft RI/FS evaluation of the cost of the excavation option is artificially high compared to the cost estimate for the containment option. The lack of details provided by the Navy limits the ability to ascertain the appropriateness of the estimate. Nevertheless, shortcomings in the Navy's costs analysis are apparent.

a. The time frames used by the Navy in the cost analysis do not reflect the reality of the two alternatives.

As Table 13-1 shows, the Navy only analyzed the two options for a period of 34 and 32 years respectively. While the work implementing the excavation alternative would easily be completed within 34 years (indeed, the actual excavation would not take more than a few years), the work implementing Alternative 3 will be in perpetuity. The Navy's analysis completely ignores the ongoing costs that would accompany Alternative 3 for tens, hundreds, perhaps thousands of years after the 32-year time frame. As mentioned in the Rad Addendum section above, this ignores the recommended 1,000 year NRC window when external radiation is present. The Navy should analyze the costs with a much greater time frame and more detail to produce a sufficient cost comparison of the alternatives.

b. The cost analysis is replete with biases, flawed logic, and missing information.

A determinative factor in estimating the cost of excavation is the estimated volume of waste to be removed from a site. The Navy uses an exaggerated waste volume in estimating the cost of Alternative 2 and fails to substantiate is volume estimate. The Navy apparently assumes that excavation will include removal of the entire 1.5 million square foot area of the landfill down to a nominal depth of around 25 feet. This is inconsistent with the knowledge gained from ongoing remedial actions at the site. Section 8 of the Rad Addendum discusses a removal action where some 45,000 cubic yards of the parcel were excavated and screened resulting in 533 cubic yards requiring off site disposition for radioactivity. Given that the cost estimate includes two separate radiological screening processes, the Navy does not provide sufficient evidence for the basis of the 1.2 Million cubic yards figure.

The equipment and schedule described yield a productivity rate of about 180 cubic yards per day for each machine. Given that nearly $23 million is estimated

annually, this production rate adds significant cost. The Navy does not provide the basis of the production rate and schedule. The information provided seems to depict an extremely inefficient process that unrealistically inflates the cost of excavation and biases the conclusions about remedial alternatives.

The cost estimates do not provide the basis of the 6% additional costs for design and permitting.

Alternative 3 has ongoing costs for "monitoring and reporting," however there are no costs for cap maintenance or repairs. As stated above, the estimates do not indicate the un-maintained life expectancy of the cap and do not account for erosion or other disturbances.

Given that the alternatives considered are very different in nearly all respects and from long term stewardship perspective, the Navy does not explain why the same 20% contingency cost is used in both of them. Normally, the longer period of time to implement and oversee a measure would lead to additional uncertainty, necessitating a higher contingency allowance. Hence, additional contingency costs should be included for Alternative 3 relative to Alternative 2. The Navy's failure to recognize the additional contingencies that will accompany the capping alternative again further biases the selection of alternatives.

c. The costs do not account for the ongoing five year review required by CERCLA.

Since a containment remedy that includes a cap will cover hazardous, radiological substances, a five year review must be required pursuant to the following section of CERCLA: "If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section 9604 or 9606 of this title, the President shall take or require such action." (42 U.S.C. § 9621(c)). The Navy does not account for this five year review in its cost analysis. Furthermore, if the original remedial action is found to be harmful to human health or the environment, the statute authorizes the President to take further remedial action, which would involve more costs. Thus, the Draft RI/FS and Rad Addendum do not reflect the real costs pertaining to Alternative 3.

We believe that the Navy's cost estimates for excavation are high and the cost estimates for the capping alternative are low, thus creating an unrealistic gap between these two alternatives. The Navy should seek out cost estimates from knowledgeable companies. The Navy should investigate the availability of cost guarantees for the excavation, transport, and disposal of waste from the E-2 landfill, and the restoration of

the site to a clean and environmentally sound area open to a variety of land-uses without perpetual encumbrances. The Navy should investigate the availability of fixed cost contracts for the clean-up with appropriate cost overrun insurance, such that neither the Navy nor ultimately the federal taxpayers would be responsible in the event of unforeseen cost overruns. It is our understanding that such site remediation structures are not uncommon today.

CONCLUSION

We believe the Navy should redraft the remediation documents to abandon the use of the presumptive remedy scheme. The Navy should include a complete RI/FS that fills in the ongoing data and information gaps and inaccuracies regarding the proposed alternatives and impacts to the Hunters Point community. As it stands, we do not believe a fair assessment of the remedial options for the site would opt for anything but excavation and proper disposal of the wastes and contaminated soils from the Parcel E-2 landfill. Thank you for this opportunity to provide you with our comments on the draft RI/FS and Rad Addendum. If you have any questions, please do not hesitate to call. Please include my office on any future notice or interested parties list. We look forward to participating in these proceedings as the Navy moves towards a final remediation decision.

Sincerely,

Douglas Chermak
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cc: Michael Lozeau
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