

# Critique

## by the Committee to Bridge the Gap

### of the

## Navy's Draft Fifth Five-Year Review

## Hunters Point Naval Shipyard

7 May 2024

### Executive Summary

Every five years, the United States Navy is required by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, also known as Superfund), to review the protectiveness of cleanup remedies at the Hunters Point Naval Shipyard (HPNS) Superfund site in light of current information and knowledge. At the core of this requirement is the recognition that new developments – e.g., evolving scientific findings about toxicity, tighter modern cleanup standards, discoveries of failures of cleanup actions taken at a site – can mandate going back and undertaking more cleanup in order to protect public health and the environment.

The Navy's November 2023 draft of the Fifth Five-Year review (FYR), however, fails to consider the most updated cleanup standards. The Navy's remediation goals (RGs) for radiological and chemical contamination remain non-protective, allowing huge amounts of contamination to be left behind. Myriad problems that the Committee to Bridge the Gap raised in our review of the 2019 Five-Year Review endure – to such an extent that one could almost copy and paste those comments into this critique. We will summarize those outstanding issues at the end of these comments, after first discussing newer issues that have arisen since the last FYR.

The Navy's draft review is almost completely silent on many of the most important developments of the cleanup which have emerged in the past five years, matters which are critical for an adequate FYR. **The Tetra Tech scandal, the most significant event of the entire cleanup, is not discussed by the Navy in the draft review** except in passing. The absence of any serious evaluation of the failings that allowed for the alleged widespread data falsification and manipulation is damning for a document with the ostensible purpose of reviewing major developments of the cleanup.

Similarly, any mention of the contamination that has been found during the retesting is also missing. **Radioactive objects have been found in two different parcels in the past year alone** – but both discoveries are omitted from the text. This is despite the fact that the Navy has

committed to a full retesting of a parcel if contamination above the remediation goal is found. Worse, **the Navy has found strontium-90 (Sr-90) at elevated levels in Parcel G**, which likewise should have triggered a full retesting of the parcel. The Navy's treatment of the Sr-90 issue has been disturbing – **the agency has tried to invalidate its own results, attempted to repeatedly change testing methods when measurements were high, and has largely kept the public in the dark about the affair**. Now, the Navy is planning to wait until after the FYR is finalized before releasing a key document related to the Sr-90 issue, further compromising public interest.

**The soil cleanup standards remain hugely unprotective and grossly outdated** – allowing contamination that produces risk far beyond what the law authorizes to be left behind. The ineffectual cleanup standards are not a new problem, but are at the heart of the issues with the Hunters Point cleanup.

**Though the Navy has internally decided to change its buildings remedy from remediation to demolition for most structures, the FYR does not include any discussion of the change**. There is no consideration to or plan given for disposal of the massive amounts of contaminated waste the demolition will generate, or any disclosure of any possible changes to the remediation goals for the remaining buildings.

Finally, **the Navy's climate resilience assessment is inadequate**. The assessment does not fully explore the issues that climate change will precipitate at Hunters Point; the issues that are explored are not scrutinized on the correct timeline, minimizing the effectiveness of the assessment as a whole.

## **I. BACKGROUND TO THE SIGNIFICANT DEFICIENCIES IN THE FIVE YEAR REVIEW**

Before addressing the problems with the current Five Year Review, it is important to give the historical background of the shipyard. The cleanup of Hunters Point has been a long and troubled process, and it is easy to look past the fundamental concerns which necessitate a cleanup in the first place. The Navy heavily contaminated the site with radionuclides and chemicals alike and, ever since HPNS was declared a Superfund site in 1989, has fought tooth and nail to weaken the cleanup and escape its obligations to remediate the site.

The Committee to Bridge the Gap has published four major reports on Hunters Point. The reports examine the history of the site's contamination and the specific issues with the cleanup – the erroneous model which has allowed the majority of the site to never be sampled, the outdated cleanup standards, and the change in remedy from cleanup to coverup. What follows is a

summary of those reports, so that the issues with this Five Year Review can be understood in context.

### **Report 1: [Hunters Point Naval Shipyard – The Nuclear Arms Race Comes Home](#)**

The extent of radiological activities undertaken at the shipyard between the end of World War II and 1969 was enormous. The Navy oversaw decontamination of radioactive ships, burning of radioactive fuel, radiological experiments, and countless other radiological endeavors at Hunters Point. It is not hyperbole to say that Hunters Point was one of the most important facilities in the U.S. government's vast organization of nuclear testing in the post-war era.

Less than a year after the U.S. dropped atom bombs on Hiroshima and Nagasaki, the first post-war nuclear weapons tests were conducted in the Pacific Ocean, called Operation Crossroads. The second test went badly awry, and contaminated dozens of ships participating in the test. 79 of those contaminated ships were brought back to Hunters Point for “decontamination” – since radioactivity cannot be neutralized by physical means, “decontamination” meant transferring the radioactivity to the rest of the shipyard.

The ships were sandblasted in open-air, allowing the radioactive grit to blow around the shipyard.<sup>1</sup> Some of the radioactive grit was also buried amidst the shipyard – in multiple instances, used sandblast grit has been found by the Navy, but not radiologically tested.<sup>2</sup> In other cases, the Navy found sandblast grit with elevated levels of radioactivity.<sup>3</sup> Furthermore, the Navy has found sandblast grit with elevated levels of naturally occurring radiation, raising the possibility that even grit used to decontaminate non-radioactive ships is leaving behind contamination.<sup>4</sup> The shipyard itself was physically being constructed with fill materials during the time radioactive sandblast grit was generated by ship decontamination.<sup>5</sup> It is possible, if not likely, that parts of the shipyard itself were constructed using radioactive material.

Aside from the decontamination of the ships themselves, Pacific nuclear weapons testing also brought back radioactivity in the form of fuel oil. More than 600,000 gallons of fuel oil in the three most contaminated ships from Operation Crossroads, including the ex-Independence, were contaminated with plutonium and mixed fission products and were taken from the ships and burned in regular boilers on shore at Hunters Point.<sup>6</sup> These airborne emissions could have distributed radionuclides through airborne deposition onto surfaces throughout the area.<sup>7</sup>

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<sup>1</sup> [Historical Radiological Assessment, Hunters Point Shipyard](#), pp. B-12, B-13, and B-36

<sup>2</sup> HRA, p. E-46

<sup>3</sup> *Ibid*

<sup>4</sup> [Cleanup crew didn't report radioactive grit / S.F. group says it will sue contractors at Hunters Point](#), SFGate, January 2001

<sup>5</sup> [Executive Summary, Status of the Environmental Remediation of the Hunters Point Shipyard](#), Office of Community Investment and Infrastructure, March 2015, p. 9-1

<sup>6</sup> HRA, 6-18

<sup>7</sup> HRA, 6-19

Beyond the decontamination efforts conducted at Hunters Point, the Navy Radiological Defense Laboratory (NRDL) also was stationed at the shipyard. NRDL oversaw a wide array of experiments with radioactive materials. At various times, NRDL held licenses to possess 60,000 curies of strontium-90/yttrium-90 (for use in fuel for space nuclear power sources), 15,000 curies of cobalt-60, 3,000 curies of cesium-137, 2000 grams of plutonium-239, 2,426 pounds of depleted uranium, 94 pounds of natural uranium, 12 pounds of natural thorium, and 2 pounds of U-235.<sup>8</sup>

NRDL also manufactured its own radioactive sources—resulting in spills. Prodigious quantities of radium-226, strontium-90, tritium and promethium-147 were used at HPNS for radioluminescent devices and deck markers; many of these ended up dumped in on-site landfills and elsewhere at HPNS, or just tossed aside by unsuspecting workers.<sup>9</sup> There were radioactive paint shops to produce these radioluminescent instruments, with radioactive wastes poured down drains and leaking into soil from breaks in sewer lines.<sup>10</sup>

There are numerous other radiological activities that took place at the shipyard, but just the ones mentioned here are enough to exhibit the various pathways Hunters Point has been radiologically contaminated by the Navy. Despite and in light of this fact, the Navy's approach to the cleanup of the shipyard has been severely lacking.

## **Report 2: The Great Majority of Hunters Point Sites Were Never Sampled for Radioactive Contamination – And the Testing That Was Performed Was Deeply Flawed**

At the heart of the Navy's mistaken approach to the cleanup is this: the great majority of Hunters Point was never sampled for contamination. Yet, the Navy declared over 90% of sites (buildings, structures, dry docks, defined open areas, etc.) exempt from radiological testing. Only 91 of the 883 sites designated in the HRA were defined as "impacted" by the Navy.

The entire basis for the Navy's decision to cut corners and exempt 90% or more of Hunters Point sites from sampling was a paper exercise—reviewing old records and assuming that contamination could only exist where they had documents showing radioactive materials were stored or used in those particular locations. Not only is the logic in such an assumption flawed, but the review of documents itself was also flawed. As the Navy admits, "Many documents had been destroyed because Federal and Navy record retention requirements allow record destruction after a designated amount of time."<sup>11</sup>

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<sup>8</sup> [Hunters Point Naval Shipyard The Nuclear Arms Race Comes Home](#), pdf p. 15

<sup>9</sup> HRA, 5-9

<sup>10</sup> HRA, 6-7

<sup>11</sup> HRA, 4-7

The premise that contamination could only exist in places where radioactive materials were known to be used or stored – the “spill model” – is implausible. The probability that contamination from sandblasting radioactive ships, burning radioactive fuel oil, casually disposing radioactive liquids, and other activities undertaken at Hunters Point could have ended up in areas around the shipyard is extremely high. As CBG put it in a previous report, “When the wind blows, the rain falls and stormwater flows, when trucks drive over one contaminated area tracking the contamination into other areas, the pollution moves.”<sup>12</sup>

As an example, the entirety of Parcel A was declared non-impacted by the Navy, and the parcel was transferred to the City without any sampling or testing. Nonetheless, years later, after public concerns were raised, the California Department of Public Health (CDPH) found a radium source (a radioluminescent deck marker) buried less than a foot below ground in Parcel A.<sup>13</sup> The dose rate at the surface above the buried source was 0.09 millirem/hour<sup>14</sup>, which equates to about 800 millirem per year, the equivalent of receiving about 400 chest X-rays annually – more exposure than getting a chest X-ray every day. This dose rate is more than 60 times what EPA has deemed “non-protective” for Superfund sites and far above any permissible dose rate for the public.

Worse, for sampling that was conducted at the 10% of so-called impacted sites, 90% of radionuclides were excluded. The HRA identified 108 radionuclides that were used at HPNS, and narrowed that list down to 33 “radionuclides of concern” (ROCs). However, the actual sampling that was done only measured for a handful of radionuclides, even excluding the majority of the already-pared-down list of 33 ROCs. Not only did the Navy not even test for many of the ROCs, but it did not even test all of the sites within the 10% it was supposed to, and used equipment that could not see much of the radiation.<sup>15</sup>

The Navy has done its best to evade the detection of contamination and therefore avoid its responsibility to clean up the site – for example, by not testing for many of the ROCS, not taking samples from all the “impacted” sites, and using inadequate measuring equipment. The discovery of the deck marker in Parcel A is just one example of the dangers of that behavior.

Undoubtedly, there are countless other instances of contamination at the shipyard that will never be found unless the Navy actually conducts testing at the majority of sites at Hunters Point, measuring for all the ROCs it should, and using the appropriate equipment. Not only is that

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<sup>12</sup> [The Great Majority of Hunters Point Sites Were Never Sampled for Radioactive Contamination — And the Testing That Was Performed Was Deeply Flawed](#), The Committee to Bridge the Gap, October 2018, pdf p. 9

<sup>13</sup> [Deck Marker Containing Radium Found at Hunters Point; No Public Hazard](#), NBC Bay Area, September 2018

<sup>14</sup> [Hunters Point Shipyard, Parcel A-1 Health and Safety Survey](#), California Department of Public Health, February 5, 2019, pdf pp. 12-13. Immediately after the object was unearthed, CDPH measured 3.4 millirem/hour on contact with the object – the equivalent of one chest x-ray every hour

<sup>15</sup> [The Great Majority of Hunters Point Sites Were Never Sampled for Radioactive Contamination — And the Testing That Was Performed Was Deeply Flawed](#)

scenario unlikely, but for the sites that the Navy has agreed to conduct radiological testing on, the cleanup goals – if contamination is found – are extremely unprotective, and expose the public and future residents to acute danger.

### **Report 3: Hunters Point Shipyard Cleanup Used Outdated and Grossly Non-Protective Cleanup Standards**

The cleanup goals used by the Navy have long been based on standards that were grossly outdated – even at the time of their adoption. Furthermore, the agency has continually and stubbornly failed to update them, or even assess their protectiveness using updated methods, despite objections from the Environmental Protection Agency (EPA)<sup>16</sup>. The cleanup levels should be based on the most recent EPA Preliminary Remediation Goals (PRGs) – but when one compares the Navy’s cleanup goals to the PRGs, they are hundreds of times less protective.

The Navy is allowing 70 times higher soil concentrations of Sr-90, 969 times higher concentrations of Ra-226, 318 times higher concentrations of U-235, and 994 times higher levels of Th-232 than the EPA PRGs.<sup>17</sup>

It is obvious that even the cleanup that the Navy is proposing to carry out leaves behind a vast amount of contamination, to the point of fatality for countless future residents. However, in addition to each defect in the Navy’s cleanup already discussed in this section, the Navy plans on covering up any contamination it finds – instead of removing it from the shipyard.

### **Report 4: From Cleanup to Coverup – How the Navy Quietly Abandoned Commitments to Clean Up Hunters Point Naval Shipyard and is Instead Covering Up Much of the Contamination**

In 1999, after finding more initial contamination than it expected in Parcel B, the Navy considered moving away from its commitments to remove contaminated soil from the shipyard, and instead use thin covers of soil or asphalt to reduce exposure to contamination, without actually removing it. In response to this consideration, the members of the SF Board of Supervisors proposed a Declaration of Policy be placed on the ballot for the upcoming election.

In 2000, San Francisco voters overwhelmingly passed Proposition P, with 86% of residents voting in favor. Proposition P asked voters if it should be that the “City policy to support a full

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<sup>16</sup> [EPA Comments on Draft Fourth Five-Year Review](#), Hunters Point Naval Shipyard, San Francisco, California, dated July 9, 2018, p. 3

<sup>17</sup> Some of these numbers differ from those in CBG’s 2018 report, “[Hunters Point Shipyard Cleanup Used Outdated and Grossly Non-Protective Cleanup Standards](#)”, because EPA has changed some of its assumptions in its PRG calculator for certain isotopes

clean-up by the Navy of the Hunters Point Shipyard, to allow unrestricted use of the entire site in the future?"<sup>18</sup> A year later, in 2001, the SF Board of Supervisors passed, and the mayor signed, a resolution affirming the proposition as official city policy.<sup>19</sup> Therefore, the cleanup should have been to the strictest standards for unrestricted use, without reliance on covers or land use restrictions.

Despite the adoption of Proposition P as official city policy, and CERCLA's requirement that remedies take into account community acceptance, the Navy nonetheless moved ahead with its change in remedy from cleanup to coverup. Starting in Parcel B, the Navy decided to employ covers of two feet of soil or four inches of asphalt,<sup>20</sup> and "institutional controls" to supposedly prohibit certain activities which would disturb the covers. In Parcels C, G, UC-1, UC-2, UC-3, E-2, and E, the Navy chose the same remedy – covers and institutional controls – instead of carrying out its obligation to remove the contamination.

The core of the issue is that covers do not allow for the unrestricted use of the shipyard, violating official city policy. There are numerous mechanisms by which contamination under the covers can be brought to the surface: cracks in the concrete, burrowing animals, and uptake by plants in residential gardens and open space are the most probable. What is certain is that the huge redevelopment project set to occur after the land is transferred to the city will require the destruction of most if not all soil and asphalt covers. The institutional controls are therefore fictions: the covers would have to be destroyed and the contaminated soil beneath them excavated, creating potential exposure to the public.

The Navy's actions during the cleanup of HPNS so far have been directly opposed to the full cleanup of the site it had long promised. Exempting the vast majority of the site from sampling, inflating cleanup goals, and employing futile covers exhibit the Navy's negligence of its obligations as the responsible party. This latest Draft Five-Year Review is no exception to that troubling pattern of conduct.

## **II. THE FAILURES OF THE FIVE YEAR REVIEW**

### **The Elephant in the Room: The Tetra Tech EC Testing Scandal**

The draft Five Year Review, like its predecessor, completely omits any consideration of the fundamental issue with the cleanup – the massive alleged fraud by the Navy's contractor, Tetra Tech EC, which called into question the entire initial cleanup. This failure is what has triggered the retesting efforts, which, as discussed in the next section, seem as fraught as the original.

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<sup>18</sup> City and County of San Francisco, "[Voter Information Pamphlet and Sample Ballot](#)," November 2000, pdf p. 267

<sup>19</sup> San Francisco Board of Supervisors, "[Adoption of Proposition P as Official City Policy for the Environmental Remediation of Hunters Point Shipyard](#)," Resolution #634-01, 2001.

<sup>20</sup> U.S. Navy, "[Amended Parcel B ROD](#)," p. 12-7

EPA, along with the Department of Toxic Substances Control (DTSC) and CDPH, has alleged Tetra Tech EC widely mishandled and falsified data during the initial cleanup. As EPA stated, summarizing the findings, **“EPA, DTSC, and CDPH found signs of potential falsification, data manipulation, and/or data quality concerns that call into question the reliability of soil data....”**<sup>21</sup> 97% of survey units in Parcel G were found to be suspect by regulatory agencies<sup>22</sup>; in Parcel C 91% were found to be suspect<sup>23</sup>; in Parcel B 90%<sup>24</sup>; and in Parcels UC-1, UC-2, UC-3, and D-2 93%.<sup>25</sup> Additionally, the US Nuclear Regulatory Commission “concluded enforcement action documented tampering with Chain of Custody documents was in some instances associated with attempts to under-represent the true extent of contamination.”<sup>26</sup> Lawsuits under the qui tam provisions of the False Claims Act were brought by whistleblowers, and, pursuant to the Act, the U.S. Justice Department is prosecuting federal claims against Tetra Tech EC.<sup>27</sup>

The findings of apparent data manipulation and falsification by regulatory agencies hung a dark cloud over the cleanup – years of work costing over \$250 million were called into question.<sup>28</sup> Despite the huge ramifications of the scandal, in the previous Five Year Review, which was released soon after it broke, the Navy did not examine the regulatory agency findings in any meaningful way. The topic should have been at the center of the review – it was clearly the most impactful development in the cleanup’s progress during that five year period. And yet, the Navy relegated the issue to the periphery, mentioning it only in passing. There was zero interrogation by the Navy of its own grossly inadequate oversight of the initial cleanup, and no inquiry into the systematic breakdown of the most fundamental aspects of the cleanup. Alas, the scandal is disregarded in the same manner in this latest draft Five Year Review as well.

## Retesting in the Wake of Scandal

The Navy’s overt lack of oversight during the initial cleanup, and the decision to omit entirely an evaluation of those systematic failures in the Fourth FYR led to severe distrust by the public regarding the Navy’s ability and commitment to effectively carry out the cleanup of Hunters Point. It is against this troubled backdrop that the Navy is conducting its retesting of the site.

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<sup>21</sup> [EPA, DTSC, and CDPH Final Comments on Draft Navy Radiological Data Evaluation Parcels B & G Report](#), December, 2017 (hereafter EPA 2017), p. 1. Emphasis added

<sup>22</sup> [EPA 2017](#), p. 20

<sup>23</sup> [EPA, DTSC, and CDPH reviews](#) of the Navy's Draft Parcel C Radiological Data Evaluation Findings Report Draft Hunters Point Naval Shipyard, San Francisco, California, pdf p. 6

<sup>24</sup> [EPA, DTSC, and CDPH reviews](#) (December, 2017) of the Navy's Draft Parcel B portion of the Radiological Data Evaluation Findings Report Draft (September, 2017) Hunters Point Naval Shipyard, San Francisco, California, pdf p. 9

<sup>25</sup> [EPA reviews](#) of Trench Units in Parcels D-2, UC-1, UC-2, and some of UC-3, pdf p. 4

<sup>26</sup> As summarized in [EPA 2017](#), pdf p. 9

<sup>27</sup> [United States Joins Lawsuits Against Tetra Tech EC Inc. Alleging False Claims In Connection With Shipyard Cleanup](#), United States DoJ, October 2018

<sup>28</sup> [Navy: Do-Over of \\$250 million clean up at Hunters Point necessary](#). Curbed SF, January 2018.



The retesting itself is only partial – rather than the Navy conducting a full retesting of Tetra Tech’s work, regulatory agencies allowed the Navy to conduct only a limited, partial retesting. For example, in Parcel G, the next parcel scheduled to be transferred to the City, the Navy is only required to fully excavate and characterize soil in 33% of the trench units.<sup>29</sup> Only if contamination is found during this first phase of retesting is the Navy obligated to excavate and test 100% of the soil in the Phase 2 trench units; if no contamination is found during Phase 1, the Navy is only required to carry out surface scanning of the remaining 67% of trench units and take some core samples<sup>30</sup> (Surface scanning, as opposed to actual soil sampling, can’t detect most radionuclides of concern at their remediation goal concentrations).

Nonetheless, there have so far been several instances of the Navy finding contamination in different parcels. But instead of adhering to the agreement to do full retesting if there were such findings, as memorialized in the work plans for each parcel, the Navy has publicly minimized the contamination findings, or even questioned the validity of its own measurements.

Its treatment of contamination found during the retesting in this most recent FYR continues to be hugely deficient. The Navy failed to include in the draft review any mention of the radiological contamination it has found in Parcels B, C, and G – it is unclear why such findings would be left out of a document that purports to “review” the cleanup. Additionally, the release of one of the key documents related to Parcel G contamination is being withheld until after the Five Year Review is finalized, which could potentially allow the Navy to escape the issue without proper oversight.

In August 2023 a radioactive deck marker was uncovered during the Parcel C retesting<sup>31</sup>. This discovery should have triggered a full excavation of the remaining trench units in Parcel C<sup>32</sup>, but the Navy instead downplayed its significance and has left it out of the draft review altogether. An additional radiological object, a small piece of glass, was found in Parcel B just months later – once again, the Navy violated the retesting agreement and did not trigger full retesting of the parcel.<sup>33</sup> Neither of these discoveries were even mentioned in the draft review – a gross mishandling of serious discoveries.

More troubling, though, are the strontium-90 (Sr-90) findings in the Navy’s Parcel G retesting efforts. The Navy has reluctantly shared some very limited information about the findings publicly, but has hidden the most serious details – and withheld the issue entirely in the draft

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<sup>29</sup> [Final Parcel G Removal Site Evaluation Work Plan](#), Former Hunters Point Naval Shipyard, San Francisco, CA, June 2019, p. 3-5

<sup>30</sup> Parcel G Work Plan, 2019, p. 3-5

<sup>31</sup> [Radioactive objects turn up at SF’s Hunters Point Shipyard, again](#), San Francisco Chronicle, December 8, 2023

<sup>32</sup> [Parcel C Removal Site Evaluation Work Plan](#), Former Hunters Point Naval Shipyard, San Francisco, CA, August 2022, pdf p. 37

<sup>33</sup> [Navy Presentation](#), Community Advisory Committee meeting, March 25, 2024, slide 8

review. What follows is a brief summary of the Sr-90 issue to date and key background details to consider.

## Discovery of Strontium-90 In Parcel G

### Sr-90 Issue Summary

During the Parcel G retesting, the Navy found exceedances of its Sr-90 remediation goal (RG) in 10% of samples tested for Sr-90, but quickly moved to declare its own results invalid – despite

#### strontium-90 Radiological Retesting for Soil HPNS Parcel G



EPA objections – by claiming its own testing method was faulty. At the October 25, 2021 Community Advisory Committee (CAC) meeting, the Navy “presented” the Sr-90 data (see chart to the left); instead of displaying the exceedances, though, the Navy left them out altogether.<sup>34</sup> The decision to withhold the exceedances and keep them off the chart was the first instance of the Navy hiding information on the Sr-90 issue from the public – but it wouldn’t be the last. And it is strikingly parallel to the original allegations of data manipulation and elevated readings being thrown out that triggered the need for retesting in the first place.

After finding nearly two dozen soil samples with Sr-90 above the remediation goal (RG), the Navy proceeded to throw out its own elevated readings. The Navy then attempted to change the testing method. Although publicly claiming that it was only tweaking small parts of the original method and was still using EPA Method 905.0, the Navy’s real change was to the separation technique itself from that required in EPA Method 905.0. EPA accepted the switch to a new method, but continued to tell the Navy that the original exceedances were valid data and that the Navy should not claim otherwise.

When using the new method, however, the Navy *still* found exceedances of Sr-90, and after retesting those samples, *still found exceedances*. Instead of finally admitting that it had a problem with Sr-90 contamination at Parcel G, the Navy once again tried to invalidate its own data, this time by claiming that its own new method was faulty and that it had failed to remove lead-210

<sup>34</sup> [Navy Presentation](#), 10/25/21 CAC meeting, slide 23

(Pb-210), creating interference. The Navy thus now wants to throw out its new measurements and new technique, just as it had thrown out its prior measurements and prior technique, because both found elevated levels of Sr-90. If the Navy accepted its own measurements, however, the house of cards would collapse, and it would have to fully excavate all Phase 2 trench units.

### Detailed Review of Sr-90 Findings

The Navy has generally refused to make public the most important documents regarding the Sr-90 issue. Aside from a few presentations and “fact sheets,” there has been almost no disclosure of the most critical aspects of the Navy’s detection of Sr-90 in Parcel G. The following information was obtained from FOIA requests made to the EPA and the Navy; if no FOIA request had been submitted, it is very unlikely this information would have come to light. It should also be noted that receiving the material from the EPA and Navy has taken years – and much of the documentation has still not been released. We here summarize the information we do have access to.

After finding 23 exceedances of Sr-90 across multiple trench units in Parcel G, the Navy proposed to change the Sr-90 measurement technique its contracted laboratory was using; the most substantial methodical change, a switch in the extraction method from chemical precipitation to Eichrom resin separation, was hidden from public view. Only the changes in the yttrium-90 (Y-90) ingrowth period and the aliquot size were made public. Regulatory agencies supported the method change but remained unmoved by the Navy’s claims that the initial exceedances were bad data. EPA officials, in an internal memo from December 2021, said that “In the absence of a *strong* justification for rejecting the initial results, or a defensible rationale for changing the approach, **it is unlikely that EPA could support using the new data to supersede existing results.**”<sup>35</sup> Furthermore, the memo continued, “If the Navy chooses to disregard data without a technically defensible reason, this decision will likely fuel the public’s mistrust. **The public perception may likely be that the Navy is choosing data to meet its agenda.**”<sup>36</sup>

The next steps taken by the Navy have and will not assuage the public’s mistrust. Even after making this switch in testing method, the Navy still found exceedances of the Sr-90 RG, according to a Navy presentation.<sup>37</sup> FOIA records do not indicate how many samples came back above the RG, only that there were “several.”<sup>38</sup> The Navy presentation, given to EPA officials in April 2022, notes that recounts of the samples which exceeded the RG were immediately carried

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<sup>35</sup> Event Memo, Carlton Waterhouse Visit San Francisco Trip, Dec 8-9, 2021, p. 18. Emphasis added. Documents referenced in this section and the next that are not publicly available are attached as an appendix to our comments.

<sup>36</sup> Event Memo, p. 19. Emphasis added

<sup>37</sup> Parcel G and Strontium-90, 4/7/22, Navy Presentation, p. 7

<sup>38</sup> Parcel G and Strontium-90 presentation

out, but that “[s]ome recount results did not confirm the sample results.”<sup>39</sup> In other words, the laboratory still found exceedances of Sr-90. Of note at this point is the fact that only the samples that exceeded the RG were recounted. EPA and CDPH officials both “expressed concerns about not reanalyzing data that were also slightly under the remedial goal and not just samples above the remedial goal.”<sup>40</sup>

It is important to mention here that the previous problems which the Navy identified with the initial testing method – a high uncertainty and method detection limit (MDC) – had been eliminated by the new Eichrom method.<sup>41</sup> Despite this, the Navy remained convinced that there was an issue with the method, simply because the results came back hot. A document summarizing a March 2022 meeting between the Navy and regulatory agencies said that, “The Navy continue[s] to see some exceedances with the new method, but **strongly believe** there are interferences with the method so are working with their lab and QA/QC validator to sort things out.”<sup>42</sup> Of course, it really doesn’t matter what the Navy believes, only what the data show.

After an unknown time “evaluating” the Sr-90 results, the Navy’s laboratory asserted that interference from Pb-210 was causing a “high bias” in the measurement of the Sr-90.<sup>43</sup> The Navy’s argument for this claim is that when tested for total beta strontium – which includes both the Sr-90 and Sr-89 isotopes – the same samples that exceeded the Sr-90 RG were found to have much lower levels of total beta strontium.<sup>44</sup> In theory, the measured value of total beta strontium in a given sample should be higher than the value of Sr-90 in the same sample, the Navy argues, since the total beta measure includes both the Sr-89 and Sr-90 isotopes.

Specifically, the Navy claimed that Bi-210, a daughter product of Pb-210, was the interferent. Its logic was thus: The Navy’s laboratory had failed to remove all of Pb-210 from the soil sample, therefore the Pb-210 present in the sample stuck to the resin cartridge used to isolate the strontium from the soil sample. Then, Bi-210 begins growing along with the Y-90. When the Y-90 fraction is removed, the Bi-210 will follow, creating a high bias.<sup>45</sup> The issue of completely removing Bi-210 does seem to be a real and valid issue when measuring Sr-90 in soil samples; it is so real that the Standard Operating Procedure (SOP) which the laboratory used to carry out the measurement of Sr-90 includes a step explicitly to prevent Bi-210 from growing in with the Y-90 and causing a high bias. The SOP’s step 11.5.2.3 states that “The 0.05 M nitric acid **removes Bi-210 that might be present due to Pb-210 from the sample tightly bound to the resin.**”<sup>46</sup> Additionally, an academic journal article discussing Pb-210 interference in Sr-90 measurement,

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<sup>39</sup> Parcel G and Strontium-90 presentation

<sup>40</sup> Draft Meeting Summary, Base Realignment and Closure Team, 2/3/22, p. 4

<sup>41</sup> Parcel G and Strontium-90 presentation, p. 6.

<sup>42</sup> Hunters Point Naval Shipyard Executive Leadership Team Meeting, March 2022, p. 3. Emphasis added.

<sup>43</sup> Parcel G and Strontium-90 presentation, p. 7

<sup>44</sup> Parcel G and Strontium-90 presentation

<sup>45</sup> Hunters Point Extraction Chromatography Analysis presentation, p. 3

<sup>46</sup> Field Change Request #006, August 2021 p. 14. Emphasis added

stresses that **“The Eichrom method for the determination of radiostrontium in water proposes elution with 0.05 M HNO<sub>3</sub>, which was found extremely useful, because at such acid concentration no radiolead is eluted from the column.”**<sup>47</sup>

In their review of an internal Navy memo regarding the Sr-90 issue, both EPA and CDPH expressed skepticism about Pb-210 interference. EPA stated that **“a cursory review of the laboratory radiological data packages provided for Parcel G didn’t seem to support a correlation between Pb-210 and elevated Sr-90 results”**;<sup>48</sup> CDPH’s Environmental Management Branch commented that “[t]he interference of Pb-210/Bi-210 with strontium is a well known problem during chemical separations. Many experimental steps have been proposed in the literature to eliminate the possibility of interference. Please explain the reasoning for not being able to resolve the Pb-210/Bi-210 interference problem.”<sup>49</sup>

Step 11.5.2.3 in the SOP that was used by the Navy’s laboratory and the journal article together make clear that though it is possible Pb-210/Bi-210 can interfere with Sr-90 measurements, **it should not have occurred in this case, since precautions were already in place to prevent it.** The Navy made no mention of this in any of its communications with regulatory agencies on the issue, and instead acted as though it were an unforeseen circumstance – though CDPH’s comment makes clear the issue should have never happened in the first place.

After “confirming” that Pb-210 was causing a high bias in the Sr-90 results, the Navy moved to establish total beta strontium as its primary screening mechanism, instead of Sr-90. The mechanics of measuring for total beta strontium follow the same SOP as before (Eichrom), but with an aborted timeline. Instead of allowing the Y-90 to grow in with the soil sample, the strontium is beta counted immediately following its removal from the extraction cartridge. The Navy’s plan stated that any samples measured for total beta strontium that came back above the RG would be tested again, this time for Sr-90, using an updated version of the initial Eichrom method.<sup>50</sup> The technical details of the revision to the method can be found in a presentation that is attached to these comments.

Regulatory agencies, before agreeing to yet another change in testing method, made clear that a validation study would need to be undertaken, to prove that measuring for total beta strontium and isotopic Sr-90 using the revised Eichrom method followed regulatory guidelines. In a May 2022 email, an official for the California Department of Toxic Substances Control (CDPH), writing to EPA and other CDPH officials, said that “we’ll need to be clear to the Navy that this is

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<sup>47</sup> M. Kocadag, et al.: [On the Interference of 210Pb in the Determination of 90Sr](#). Nuclear Technology & Radiation Protection: Year 2013, Vol. 28, No. 2, pp. 163-168, p. 1. Emphasis added

<sup>48</sup> EPA Comments on Technical Memorandum, subtitle “Eichrom Method and Associated Data - Section 3.2 and 3.2.1.” Emphasis added

<sup>49</sup> CDPH EMB Comments on Memorandum, Comment #8

<sup>50</sup> Parcel G and Strontium-90 presentation , p. 11

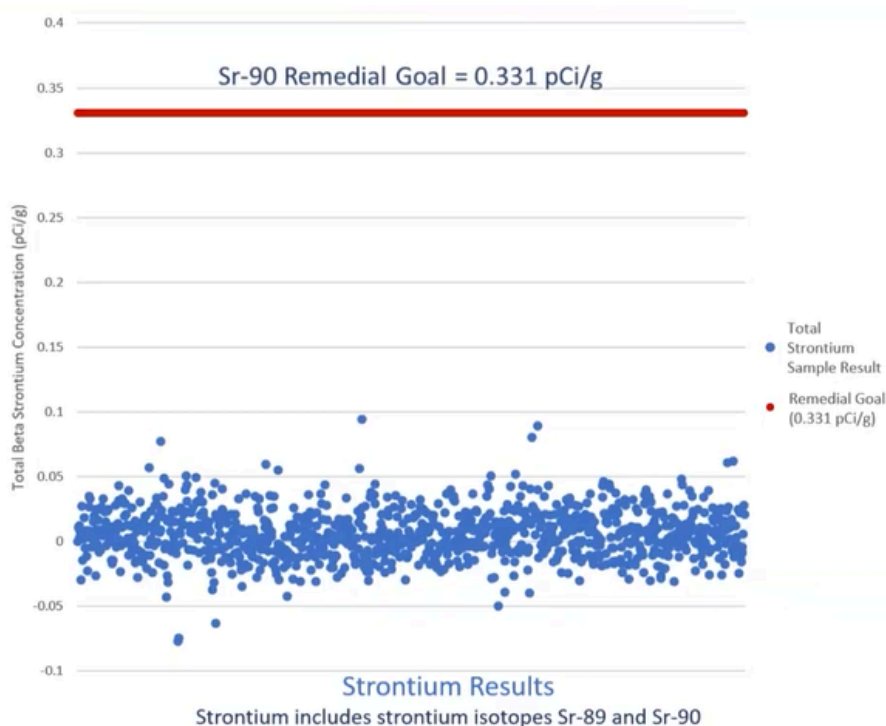
‘improve confidence’ in the method, **and in no way has any bearing on the original samples that were analyzed and the decision yet to be made on those results.**<sup>51</sup> Yet again, a regulatory official made plain the fact that the original data showing the 23 exceedances are valid data until proven otherwise.

Though the “validation study” is not publicly available, there is a remarkable admission made by the laboratory which contributed to the study. Eurofins, in a December 2022 memo, admitted that “that the carrier used for the validation study had been sub-optimally standardized, resulting in a low bias to sample results.”<sup>52</sup> Furthermore, the memo said that “At the time, it was believed that only the results from the validation study were affected. On December 22, 2022, the laboratory discovered that HPNS samples had been affected too.”<sup>53</sup> It is unknown exactly which samples at HPNS were affected, but the fact that there is hard evidence that there was a *low bias* in at least a portion of the samples is astonishing – and completely contradicts the Navy’s repeated claims of a high bias.

To make matters worse, the Navy is not planning to make the validation study public until after the FYR is completed. That decision is plainly not in the interest of the public or a complete cleanup – there should be time for the public and independent experts to weigh in on the Sr-90 issue, before the Navy declares that the cleanup is going perfectly smoothly.

At the August 22, 2022 CAC meeting, the Navy once again presented a chart showing Sr-90 data. This

time, though, the Navy not only left out the 23 exceedances from the graph, but changed the nature of the data entirely: there are far more data points than in the Oct. 2021 chart, and all data points which were in the 0.15 pCi/g to 0.35 pCi/g range in the first graph (i.e., the higher



<sup>51</sup> Emails between CDPH and EPA officials, May 2022, p. 1

<sup>52</sup> Eurofins memo, December 22, 2022

<sup>53</sup> Eurofins memo, December 22, 2022

measurements shown in the previous chart) are gone in this one. Furthermore, roughly half of the data points are below zero. It is obvious that there cannot be negative amounts of any chemical or radiological compound in a sample. No explanation is given by the Navy why they are claiming negative values for strontium. Perhaps the below-zero values are present because of steps taken in the calibration of the machines that measure for radioactivity. However, those data points should never be presented as negative in the data presentation; the presence of purported below-zero data points indicates that the Navy did not complete this particular data evaluation in the appropriate manner, or worse, that it left in the negative values in order to give the appearance publicly that levels of Sr-90 were so low as to be negative.

When the graph was presented nearly two years ago, there had been no public disclosure that the Navy was planning to change the method yet again – this time to use total beta strontium as the primary screening method – meaning that the data displayed did not appear in context to the public. Instead, the Navy implied that after fixing the initial problems with the testing method, the true and accurate results had finally been attained. The fact that the Sr-90 issue remains ongoing and unresolved refutes that implication. Nonetheless, at recent CAC meetings, the Navy continues to give updates on Sr-90 in Parcel G, asserting that a method validation study is almost complete, although it refuses to release it until after the comment period on the Five Year Review passes.

To recap, the Navy found Sr-90 exceedances in 23 soil samples in summer 2021. Regulatory agencies insisted the measurements were valid, but approved the Navy's change to the testing method, the most important part of which was hidden from the public. Using the new method, the Navy *still* found exceedances, and even after recounting those, *still* saw exceedances. The Navy then blamed those exceedances on its own purported failure to eliminate Pb-210/Bi-210 interference, even though the testing method specifically took into account the possibility of such interference and included steps to eliminate it. Now the Navy wants to use total beta strontium as its primary screening method, and only measure for Sr-90 using a revised method as a confirmation. Taken together – and keeping in mind the scandal that led to this retesting in the first place – this string of events is highly suspicious and not only warrants further investigation, but at the bare minimum necessitates inclusion in the Navy's draft five year review. The public needs to be aware that the Navy has continually obfuscated information that is critical to the community's health, and has so far enacted a botched retesting of Parcel G at best, and fraudulent (again) at worst. The outright exclusion of the Sr-90 issue from the draft review is completely unacceptable.

### **Failure to Mention Change in Buildings Remedy**

After the Navy released the Fourth Five Year Review in 2019, the EPA and Navy engaged in a dispute over the protectiveness of the building remediation goals. In short, the EPA objected to the Navy's use of RESRAD to calculate protectiveness, and told the Navy to use the EPA

Building Preliminary Remediation Goal (BPRG) calculator. The Navy refused, and the two parties were unable to resolve the disagreement. Under CERCLA and the Federal Facilities Agreement for HPNS, the Navy is required to use EPA guidance or gain EPA approval for an approach that would be equally protective, yet it has failed to do so.

Publicly, there has been little to no disclosure of the dispute since 2020, but CBG has greater insight into the disagreement due to a FOIA request filed by Public Employees for Environmental Responsibility (PEER). Recently, PEER sent an updated request to EPA to capture any communications between the Navy and EPA since May 2021. In response, an EPA official wrote that, “the Navy has moved away from keeping the remaining buildings at the site except for five buildings that are on the National Historic Register... The goal now is to demolish 77 non-radiologically impacted and 25 potentially radiologically impacted buildings at HPNS.”<sup>54</sup>

However, despite this apparent (and huge) change in the buildings remedy, there is no mention of it in the Navy’s draft review. The shift from remediation to demolition of such a large number of buildings is a monumental decision – and elevates the importance of disposing the contaminated building material in a safe manner. Similarly to the shift in the remedy itself, there is no further discussion of building material disposal or any changes to the building RGs for the five buildings still set to be retained.

These three issues – the change in remedy, how the demolished building material will be disposed of, and questions surrounding the adequacy of RGs for the buildings that will remain are all clearly ones that the public needs to not only be made aware of, but given the chance to comment on. These matters should have been addressed in this draft FYR.

### **Failure to Accurately Assess Protectiveness of Soil RGs**

The draft review does not adequately assess the protectiveness of soil remediation goals. Instead, the draft review leans on the radiological addendum that was released as part of the Fourth FYR – which incorrectly asserted that the RGs were protective of human health. The draft review states that the addendum “concluded that the current RGs are protective for all future land users.”<sup>55</sup> Of course, the RGs are not protective for all future land users; the Navy refused to run the risk calculations with the appropriate inputs for all such uses. The statement is false for a number of other reasons, in part because of its failure to acknowledge that EPA concluded it could not affirm the protectiveness of the soil PRGs, and that the Navy’s own risk estimates for its soil RGs in its Fourth FYR were higher than EPA’s general upper limit of the acceptable range.

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<sup>54</sup> October 26, 2023, email from EPA official regarding a FOIA request

<sup>55</sup> Draft Review, p. 1-9



The only section of the draft review that includes any new information about the protectiveness of the RGs is Appendix F. The appendix displays results from the EPA's new Peak PRG calculation method, evaluating the Navy's RGs for HPNS. The results seem to show that the Navy's estimate of cumulative risk for all ROCs remains virtually unchanged.

Remarkably, the Navy's own new estimate of total risk is again over the acceptable limit. The Navy estimates total risk from its soil RGs (see p. 531 of the draft FYR) as  $2.7 \times 10^{-4}$ , about three times the  $1 \times 10^{-4}$  general upper limit to the risk range.<sup>56</sup> And the Navy only gets to that figure by leaving out the background for radium, which is required to be considered in establishing risk from RGs. When background is included for radium's RG, the total risk goes, using the Navy's calculational assumptions, up to  $3.48 \times 10^{-4}$ , well above the acceptable risk range.

The listed RG for Radium-226 (Ra-226) is 1 pCi/g, when it should be 1 pCi/g *above background*. The Navy has continuously failed to correctly apply this rule, and the draft review is no exception. The correct RG should be 1.861 pCi/g, as described in the most recent retesting work plan, the "Removal Site Evaluation Work Plan, Parcels D-2, UC-1, UC-2, and UC-3," released in 2023. A footnote for Ra-226 in the work plan states that "Remediation goal is 1 pCi/g above background per agreement with USEPA... Ra-226 background for definitive data is 0.861 pCi/g based on the off-site BTV determined in the Final Background Soil Study Report".<sup>57</sup>

The situation is actually far worse than described so far. The Navy's insistence on including inappropriate inputs skews the calculations. The scenario chosen by the Navy is **resident without garden**, which disregards the fact that there is no actual land use restriction on future residents growing produce in their gardens. The only restriction adopted to date is a requirement that gardens be in raised beds, but roots of plants penetrate far deeper than the raised bed and thus into remaining contamination. A hypothetical restriction requiring impermeable bottoms to such beds has never been actually adopted, and were it to be so, would be meaningless, as there is no realistic way to enforce it.

When one includes the correct exposure scenario, residential with garden, and the correct RG for Ra-226, the excess cancer risk is staggering, and much greater than the Navy is asserting it is,  $1.96 \times 10^{-3}$ , **or about twenty times higher than the upper limit of the acceptable risk range.**

The Navy must amend the draft review to correctly apply the 'above background' rule to the Ra-226 RG, and use the resident scenario *with the garden pathway turned on*, to accurately evaluate excess cancer risk from radiological contamination. Furthermore, the Navy is required

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<sup>56</sup> See EPA Nov. 15, 2019, comments on Soil Addendum from prior Five Year Review, p. 2, indicating that the soil RGs exceed "the upper limit of the cancer risk range that is generally used at CERCLA sites ( $1 \times 10^{-4}$ , equivalent to one in ten thousand.)"

<sup>57</sup> [Removal Site Evaluation Sampling and Analysis Plan](#) Parcels D-2, UC-1, UC-2, and UC-3 Removal Site Evaluation Former Hunters Point Naval Shipyard, San Francisco, California, 2023, pdf p. 240

to add the risks from chemical contamination in its risk calculations. Nowhere in the draft review are the risks from chemical contamination evaluated – and their exclusion in this section dilutes the true excess cancer risk even more than it already is. When they are included, risks from the RGs are substantially higher, and likely exceed protectiveness requirements by a considerable amount.

### **Climate Resilience Assessment is Inadequate**

The Navy's analysis of the impacts that climate change will have on the shipyard is deficient. While the analysis does acknowledge that climate change could cause contaminated groundwater to rise to the surface, it does not delve far enough into what that process could look like.

Sea level rise, storm surge, and seawater inundation are all only projected through 2065. Such a limited timeline does not take into account the even worse effects that will be felt by future shipyard residents decades later – it is a certainty that the same structures to be built by the redevelopment will exist far beyond 2065, necessitating a much longer timeline when projecting climate change's effects.

Furthermore, sea level rise, storm surge, and seawater inundation are all intricately linked, but are treated separately by the Navy's analysis. This distinction cannot be justified, as the combined effects of all three forces present much more risk than any single one does. Any analysis of sea level rise, storm surge, and seawater inundation must be conducted in a holistic manner, so as to capture the true danger of the three issues.

Another concern that is overlooked in its Climate Resilience Assessment (CRA) is the movement of groundwater – the Navy assumes that sea level rise will uniformly push groundwater towards the surface, while in reality the process is more complicated than that. Rising groundwater could drive contaminants to other areas of the shipyard, or into the Bay itself. The effects of the asymmetrical distribution of rising groundwater as a result of sea level rise must be analyzed by the Navy.

Also on the issue of groundwater, the possibility that the rise of groundwater will affect the thin asphalt and soil covers used to supposedly keep contamination from the surface should be examined. Already the covers have the potential to be affected by cracking, burrowing animals, and plant uptake – rising groundwater could make the already-ineffective remedy even more so.

Lastly, the possibility that the biological and chemical composition of sub-marine environments will be altered by the increase in saltwater intrusion increases goes unmentioned in the Navy's assessment. Section 5.3.4 of the CRA discusses the effects of saltwater intrusion on subsurface remedies throughout the shipyard – and comes to the conclusion that “all parcels at HPNS are

resilient to this potential exposure scenario<sup>58</sup> – but there is no real consideration of the range of dangers that saltwater intrusion may present.

### **III. OUTSTANDING ISSUES FROM THE 4TH FYR THAT REMAIN UNRESOLVED IN THE 5TH FYR**

#### **Failure to Examine the Systemic Failure of the Cleanup Process Evidenced by the Tetra Tech Scandal**

Just as in the Fourth FYR, the Navy's latest draft review fails to discuss, beyond a passing comment, the scandal that casts a shadow over much of everything that occurred in the cleanup to date. The scope of the alleged data falsification and fabrication should have required an in-depth examination of how exactly such fraudulent activity was allowed to take place. But there is no such analysis in the FYR. Any mention of the scandal is extremely limited. The scandal raises serious questions about the Navy's own un-reliability as supervisor of the cleanup, yet these essential matters are unaddressed in the FYR.

#### **Failure to Include Parcel A in the Five-Year Review at All**

The exclusion of Parcel A from any evaluation in the draft review is unsurprising, but disappointing nonetheless. The parcel was long ago declared non-impacted, without any kind of soil testing, and only a few building tests. The decision to declare the parcel clean, and to transfer it to the city, was based on scant evidence; since the Navy had no records of radionuclide use in Parcel A buildings, the Navy determined that radiological contamination could not exist. The Navy's conclusion completely ignores the possibility that contamination from other parcels migrated across the site – radioactive sandblast grit from the decontamination of ships used in atomic weapons testing, for example.

#### **Drastically Reduced List of Radionuclides of Concern**

The draft review does not include any analysis of the decision to greatly reduce the list of HPNS radionuclides of concern (ROCs). In the 2004 Historical Radiological Assessment (HRA), the list included about 100 (33 long-lived) to only a handful in the Parcel G, Parcel C, and Parcel UC-1, UC-2, UC-3, & D-2 retesting plans. Especially because many of the ROCs identified in the HRA last for centuries, it doesn't make sense to shrink the list of ROCs to 11, simply ignoring two-thirds of the long-lived radionuclides identified in the HRA. Leaving out such a large number of ROCs creates the possibility that there could exist, in places throughout the shipyard, contamination which was never even looked for.

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<sup>58</sup> Draft review, pdf p. 313

### **90% of HPNS Arbitrarily Removed from Scope of Measurements and Cleanup**

The 2004 HRA arbitrarily designated 90% of the shipyard to be exempt from any kind of cleanup. This questionable decision has never – in this draft review or otherwise – been appropriately explained. The choice to exempt the vast majority of the site from sampling was based on the spill model – the idea that contamination in an area must be due to radiological activities that were conducted in the area – and ignores contamination that could have easily migrated between sites in the shipyard, and the likelihood that the available historical records are incomplete. This assumption should be reevaluated using all current information.

### **Radioactive Sandblast Grit**

As in the previous FYR, the Navy only mentions that removal actions of sandblast grit have been carried out at the site. It fails to mention the full scope of the sandblast grit issue: that the Navy does not really know where much of it is, and that the site itself could have been partly made out of radioactive grit. Sandblast grit and the dangers it may present should be more closely examined in the review.

### **Navy Further Weakening an Already Inadequate Remedial Method**

The Fourth FYR made the admission that soil vapor extraction (SVE) was having trouble effectively reducing source mass of volatile organic carbons (VOCs) due to the conditions in the subsurface of the soil. This draft review makes the same assessment, stating that “SVE implementation in Parcels B-1 and C is reducing source mass, but with limited effectiveness due to diffusion-limited conditions in the subsurface. Although Institutional Controls (ICs) will maintain future protectiveness, source removal inefficiency is extending the period within which SVE will be implemented.”<sup>59</sup> Furthermore, regulatory agencies, as they did in 2019, do not agree “with the Navy’s risk assessment methodology used to reduce the [Areas Requiring Institutional Controls (ARICs)] for VOC vapors.”<sup>60</sup>

Therefore, the Navy is both relying on ICs on the one hand and reducing the area for which they deem ICs necessary, by way of a manipulated risk assessment, all because the original remedy of actually cleaning up the VOCs isn’t working. This juxtaposition and its implications on protecting human health need to be further investigated in this review.

### **Soil and Asphalt Covers**

Soil and asphalt covers are mentioned frequently throughout the draft review, but no words are dedicated to an interrogation of their effectiveness. Part of the introduction of these comments exposed that contamination can easily penetrate soil and asphalt covers, rising to the surface one

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<sup>59</sup> Draft Review, pdf p. 149

<sup>60</sup> Draft Review, pdf p. 93

way or another and putting human health at risk. Furthermore, development of the site will necessitate tearing up whatever covers might exist. In light of those revelations, it is no surprise that the Navy is unwilling to include their own analysis, which would undeniably come to the same conclusion. Nonetheless, the Navy still must investigate whether just covering up rather than cleaning up contamination is truly protective, particularly over the lifetime of the contaminants, based on the most current information.

## **Conclusion**

The Navy's draft Fifth Five Year Review is yet another failure in a long line of them. The draft review fails to include multiple fundamental aspects of the cleanup, as well as new developments which clearly should have been reviewed. If key facets of the cleanup do not shift, current and future residents of the Hunters Point-Bayview area will be adversely impacted by the effects of weak cleanup standards, contamination in numerous parcels, and an oversight entity that does not seem interested in carrying out its obligations to clean up the site.

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