DEPARTMENT OF THE NAVY
MARE ISLAND NAVAL SHIPYARD
695 WALNUT AVE SUITE 5100
MARE ISLAND, CA 94592-5100

IN REPLY REFER TO:
9900
Ser 105.2/85

From: Commander, Mare Island Naval Shipyard
To: Commander, Naval Sea Systems Command (SEA 08R) ✓

Subj: RELEASE OF FORMER HUNTERS POINT NAVAL SHIPYARD DRY DOCK #4

Ref: (a) NAVSHIPYD MARE ltr 9900 Ser 105.2/6 of 11 Jan 94
(b) NAVSEA ltr Ser 08R/94-11137 of 9 Feb 94

Encl: (1) Release for Unrestricted Use of Former Hunters Point Naval Shipyard Dry Dock #4, Revision A

1. Mare Island Naval Shipyard (NAVSHIPYD MARE) submitted reference (a) recommending approval for the release of Dry Dock Number 4 at the former Hunters Point Naval Shipyard. Reference (b) provided Naval Sea Systems Command (SEA 08R) (NAVSEA) approval to release Dry Dock Number 4 at Hunters Point Naval Shipyard from Naval Nuclear Propulsion Program radiological controls subject to comments. Reference (b) requested NAVSHIPYD MARE to revise the release report of reference (a) to address the NAVSEA comments.

2. Dry Dock Number 4 at Hunter's Point Naval Shipyard has been identified as no longer being needed to support naval Nuclear Propulsion projects. Enclosure (1) has been prepared detailing the release of the facility for unrestricted use and incorporates the revisions requested in reference (b). Enclosure (1) is forwarded for information only.

R. D. O'BRIEN
By direction

Copy to:
NAVSEA (08R) (J. V. Betschart)
NRRO (Maro)

RELEASE FOR UNRESTRICTED
USE OF FORMER HUNTERS POINT NAVAL SHIPYARD
DRY DOCK #4
Revision A

Prepared by: _____
Craig Marchione, Head, Radiological Engineering
Production Branch, MINS

7/20/94
Date

Reviewed by: _____
Robert Carter, Head, Radiological Engineering
Division, MINS

7/21/94
Date

Approved by: _____
R. D. O'Brien, Director of Radiological Control, MINS

7/22/94
Date

RELEASE FOR UNRESTRICTED USE

OF HUNTERS POINT

DRY DOCK #4

1. BACKGROUND

1.1 Hunters Point Naval Shipyard (HPNS) was purchased by the Navy in 1939 and was closed to Naval operations in 1974. During this time period no nuclear powered ships were dry-docked at the HPNS facility. Beginning in 1985 the Navy used Dry Dock #4 at HPNS, intermittently, to support dry-docking of nuclear powered surface combat ships. In April 1985 detailed radiological surveys were performed to establish the background radiation levels for this facility before the first use for a nuclear-powered ship. The dry dock was used to support four availabilities and one emergency dry-docking; (1) an emergency dry-docking of USS ENTERPRISE (CVN-65) in 1985, (2) an availability of ENTERPRISE in 1986 (right after the emergency dry-docking), (3) an availability of USS CARL VINSON (CVN-70) in 1987, (4) an availability of USS CALIFORNIA (CGN-36) in 1987, and (5) an availability of USS TEXAS (CGN-39) in 1989. After each availability, surveys were performed to confirm the radiological condition of the dry dock had not increased from the initial condition and the dry dock was released for unrestricted use. Personnel who subsequently use this facility will not receive measurable radiation exposure above natural background levels that exist in areas not affected by Naval nuclear propulsion plant work.

1.2 The release surveys were performed in accordance with reference 5.1, revisions 6 through 8.

⚠ 1.3 No spills of Naval Nuclear Propulsion Program material have been reported in the dry dock during this use period.

2. SURVEYS

2.1 Frisk Surveys

2.1.1 Direct frisk surveys were performed with an E-140N (or equivalent) portable frisker by frisking all accessible surfaces of the dry dock floor within one-half inch. The DT-304/PDR frisker probe sensitivity is such that it detects radioactivity levels greater than 450 picocuries (pCi) per frisk, the limit specified in reference 5.1.

2.2 Gamma Scintillation Surveys

2.2.1 Gamma scintillation surveys were performed by surveying the dry dock floor using a PRM-5N or CRM-595 (or equivalent) gamma scintillation meter with a sodium iodide (NaI) detector. Survey scans were performed in the HV1-PHA mode within one-half inch of the surface being surveyed and general area surveys performed in the HV2-GROSS mode at waist level. The PRM-5N/CRM-595 survey meter responds to a gamma energy range of 1.0 to 1.5 MeV in the HV1-PHA mode and energies greater than 100 KeV in the HV2-GROSS mode. Reference 5.1 requires all readings exceeding twice the natural background be investigated and the cause identified.

2.3 Gross Gamma Analysis

2.3.1 Gross gamma activity analysis of soil or loose material samples was performed using an Eberline Mini-Scaler, Model MS-2 with a thallium activated sodium iodide (NaI(Tl)) scintillation detector. Results are expressed as equivalent Co-60 activity (energy range of 0.1 to 2.1 MeV) using a Minimum Detectable Activity (MDA) of between 1.2 and 1.9 X 10^{-5} μCi/gm. The range of MDA's specified in this report is due to different counting systems being used for sample analysis at the end of each availability. The MDA is the ability of a counting system to detect the disintegration given off by a known radioactive source (used in the calibration of each counting system). Differences in the MDA are a result of various background counts obtained during calibration and differences in the ability of a particular detector to detect a disintegration and the electronic equipment to transmit and count the detection. Reference 5.1 requires material to be removed until the area is inspected and samples do not exceed 3 X 10^{-5} uCi/gm equivalent Co-60 over background.

2.4 Isotopic Spectroscopy

2.4.1 Isotopic Spectroscopy was performed using a Canberra Series 35 plus multi-channel analyzer with a pure germanium detector. Isotopic spectroscopy was performed on samples from areas where gamma scintillation surveys indicated greater than twice the natural background in order to characterize the activity. Isotopic spectroscopy was also performed on selected areas of the dry dock floor using a portable Series 10 Canberra multi-channel analyzer with a pure germanium detector.

3. SURVEY/SAMPLE METHODOLOGY

3.1 The dry dock floor was surveyed per paragraph 2.1 and 2.2. The dry dock floor is approximately 148,222 square feet. The dry dock was gridded off in approximately 28 feet by 12 feet grids. This grid size was used for the initial and subsequent surveys of the dry dock.

3.2 Samples of soil or loose material were obtained, concentrating around the longitudinal drainage trenches, the transverse bilge block bearer slots and wherever radioactive liquid collection facilities or other radioactive systems/components had been located. In addition, sediment samples were obtained from the caisson sumps.

3.2.1 The surveys taken to establish the initial conditions included one sample from each of 50 randomly selected grids and three sediment samples from the caisson sumps.

3.2.2 The surveys taken at the end of each availability included one sample from at least five randomly selected grids and at least two sediment samples from the caisson sumps.

4. SURVEY RESULTS

4.1 The dry dock survey results for establishing the initial conditions were obtained in April of 1985, analyzed per the requirements of revision 6 to reference 5.1, and are described below:

4.1.1 Frisk surveys of all grids were less than 450 pCi/frisk.

4.1.2 Gamma scintillation surveys indicated between 200 cpm and 400 cpm in the HV1-PHA mode and between 3,500 cpm and 6,500 cpm in the HV2-GROSS mode.

4.1.3 Gross gamma analysis showed 72 randomly selected samples to be less than 1.2×10^{-5} µCi/gm (MDA for this counting system).

4.1.4 Isotopic spectroscopy of two samples did not detect the presence of any non-naturally occurring radionuclide.

4.2 The dry dock survey results after the availability of ENTERPRISE were obtained in January of 1986, performed per reference 5.2 and are described below. The dry dock was released from radiological controls using revision 6 to reference 5.1.

4.2.1 Frisk surveys of all grids were less than 450 pCi/frisk.

4.2.2 Gamma scintillation surveys indicated between 180 cpm and 400 cpm in the HV1-PHA mode and between 4,000 cpm and 6,500 cpm in the HV2-GROSS mode. (A) These surveys verified no gamma scintillation survey readings were greater than twice the readings obtained during the initial survey.

4.2.3 Gross gamma analysis showed 25 randomly selected sediment samples to be less than 1.69×10^{-5} µCi/gm (MDA for this counting system).

4.2.4 Isotopic spectroscopy of two samples did not detect the presence of any non-naturally occurring radionuclides.

4.3 The dry dock survey results after the availability of CARL VINSON were obtained in July of 1987, performed per reference 5.3 and are described below. The dry dock was released from radiological controls using revision 6 to reference 5.1.

4.3.1 Frisk surveys of all grids were less than 450 pCi/frisk.

4.3.2 Gamma scintillation surveys all showed levels less than twice background of 200 cpm in HV1-PHA mode and 5,000 cpm in the HV2-GROSS mode. Grid D-1 was not surveyed during this period.

4.3.3 Gross gamma analysis showed five randomly selected sediment samples to be less than 1.9×10^{-5} µCi/gm (MDA for this counting system).

4.4 The dry dock survey results after the availability of CALIFORNIA were obtained in January of 1988, performed per reference 5.4 and are described below. The dry dock was released from radiological controls using revision 6 to reference 5.1.

4.4.1 Frisk surveys of all grids were less than 450 pCi/frisk.

4.4.2 Gamma scintillation surveys indicated between 150 cpm and 400 cpm in the HV1-PHA mode and between 3,500 cpm and 7,000 cpm in the HV2-GROSS mode. One grid, D-1, indicated greater than twice the readings obtained during the initial survey. Specifically, the readings were 2,500 cpm in the HV1-PHA mode and 40,000 cpm in HV2-GROSS mode. (A) The cause of the increased counts was determined to be a trench in the middle of grid D-1. The trench was direct frisked with results of 1,000 pCi/frisk. The portable Series 10 Canberra

multi-channel analyzer was used to perform an isotopic spectroscopy. This analysis determined the principal isotopes in the trench to be radium, radium daughter products, and potassium 40. No Co-60 or other non-naturally occurring radionuclides were detected.

4.4.3 Gross gamma analysis showed 20 randomly selected sediment samples to be less than 1.69×10^{-5} µCi/gm. Four samples were obtained from the radioactive material storage area (located on the dry dock floor) and the results were less than 1.9×10^{-5} µCi/gm.

4.4.4 Isotopic spectroscopy of one sample did not detect the presence of any non-naturally occurring radionuclides.

4.5 The dry dock survey results after the availability of TEXAS were obtained in September of 1989, performed per reference 5.5 and are described below. The dry dock was released from radiological controls using revision 8 to reference 5.1.

4.5.1 Frisk surveys of all grids were less than 450 pCi/frisk.

4.5.2 Gamma scintillation surveys indicated between 125 cpm and 300 cpm in the HV1-PHA mode and between 3,500 cpm and 8,500 cpm in the HV2-GROSS mode. Grid D-1 was again identified as being greater than twice the readings obtained during the initial survey. In addition, six grids (AE3, AF3, AH3, AJ3, AK3, and AM3) showed levels slightly greater than twice the readings obtained during the initial survey in the HV2-GROSS mode. An investigation indicated these elevated readings were caused by the keel blocks located in these grids. The keel blocks were located forward of the forward most overboard discharge opening, no spills or spread of contamination had been identified during this availability and the gamma scintillation surveys (in the HV1-PHA mode) within one-half inch of the keel block surfaces in question (located in grids AE3, AF3, AH3, AJ3, AK3, and AM3) did not show counts above twice background. Based on this information the elevated readings on the keel blocks were determined to be caused by naturally occurring radioisotopes and required no further investigation. The highest reading found in the six grids was 12,000 cpm (in the HV2-GROSS mode), which roughly correlates to 0.02 mr/hr. The keel blocks were constructed of a concrete base and a hardwood (usually white oak) top. Shims and build-up material is fir or plywood and held in place by "steel dogs". To support the availabilities, NAVSHIPYD MARE used existing keel blocks and had some keel blocks manufactured to supplement the existing supply.

4.5.3 Gross gamma analysis showed 12 randomly selected sediment samples to be less than 1.9×10^{-5} µCi/gm (MDA for this counting system). Three of these samples were recounted using an MDA of 5×10^{-8} µCi/gm. These sample results showed equivalent Co-60 levels between 3.1 and 3.6×10^{-7} µCi/gm. The nine samples not counted with an MDA less than 1×10^{-6} µCi/gm are not retrievable, therefore recounting with the lower MDA is not possible.

4.5.4 Isotopic spectroscopy of three randomly selected samples did not indicate the presence of any non-naturally occurring radionuclide.

4.6 Detailed data for the initial baseline surveys and the four separate post-use surveys area being maintained on file.

4.7 The surveys performed of Dry Dock #4 at HPNS show no detectable radioactivity attributed to the Naval Nuclear Propulsion Program.

5. REFERENCES

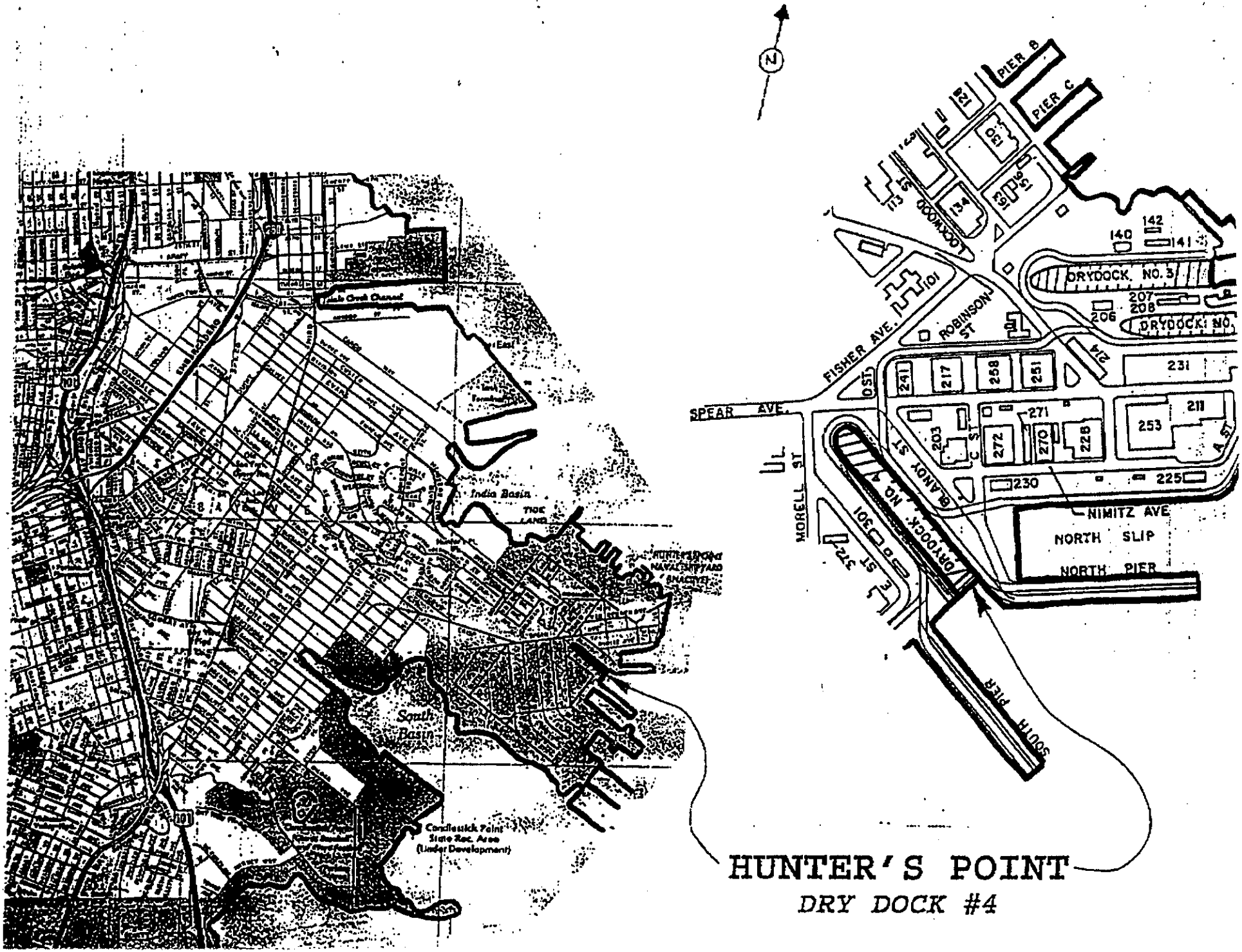
5.1 NAVSEA 389-0288, Radiological Controls for Shipyards

5.2 Technical Work Document WIN 105/CVN-665-4

5.3 Technical Work Document WIN 105/CVN-707-2

5.4 Technical Work Document WIN 105/1367-3

5.5 Technical Work Document WIN 105/CGN399-3



HUNTER'S POINT

DRY DOCK #4