PUBLIC NOTICE

US Army Corps
of Engineers
New York District
Jacob K. Javits Federal Building
New York, N.Y. 10278-0090
ATTN: Regulatory Branch

In replying refer to:
Public Notice Number: **NAN-2019-01440-EBR**
Issue Date: February 23, 2021
Expiration Date: March 25, 2021

The New York District, of the U.S. Army Corps of Engineers has received an application for a Department of the Army permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403), Section 404 of the Clean Water Act (33 U.S.C. 1344) and Section 103 of the Marine Protection, Research & Sanctuaries Act of 1972, as amended (33 U.S.C. 1413):

APPLICANT: Department of the Navy
Naval Weapons Station Earle
201 Route 34 South
Colts Neck, New Jersey 07722

ACTIVITY: Maintenance dredging of approach channels, a turning basin, and specific areas adjacent to existing piers, associated with Naval Weapons Station Earle, to a depth of -45 feet below Mean Lower Low Water (MLLW) (plus 2 feet of allowable overdepth) for a period of three years, with subsequent placement of the dredged material at the Historic Area Remediation Site (HARS) for the purpose of remediation.

WATERWAY: Sandy Hook Bay and the Atlantic Ocean

LOCATION: Township of Middletown, Monmouth County, New Jersey

A detailed description and plans of the applicant's activity are enclosed to assist in your review.

The decision whether to issue a permit will be based on an evaluation of the probable impact, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership and, in general the needs and welfare of the people. The decision of whether to issue a Department of the Army Permit for maintenance dredging and placement of the dredged material at the Historic Area Remediation Site (HARS) will also be based on whether the material meets the requirements of applicable implementing regulations. This activity is also being evaluated to determine that the proposed placement of dredged material will not unreasonably degrade or endanger human health, welfare or amenities, the marine environment, ecological systems or economic potentialities.

On September 26, 2000, the U.S. Environmental Protection Agency (USEPA) and U.S. Army Corps of Engineers (USACE) signed a joint Memorandum of Agreement (MOA) outlining the steps to be taken to ensure that remediation of the HARS continues in a manner appropriately protective of human health and the aquatic environment. In making the determination evaluating placement of dredged material, the criteria established by the USEPA will be applied, including the interim change to one matrix value for polychlorinated biphenyls (PCB's) as described in the joint MOA. In addition,

based upon an evaluation of the potential effect which the failure to utilize this ocean site will have on navigation, economic, and industrial development, and foreign and domestic commerce of the United States, an independent determination will be made of the need to place the dredged material in ocean waters, other possible methods of disposal, and other appropriate locations.

The U.S. Army Corps of Engineers neither favors nor opposes permit issuance for the applicant's proposed activity. The purpose of this public notice is to solicit comments from the public; federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

ALL COMMENTS REGARDING THE PERMIT APPLICATION MUST BE PREPARED IN WRITING AND EMAILED TO WILLIAM.T.BRUNO@USACE.ARMY.MIL OF THIS OFFICE BEFORE THE EXPIRATION DATE OF THIS NOTICE, otherwise, it will be presumed that there are no objections to the activity.

Comments submitted in response to this notice will be fully considered during the public interest review for this permit application. Comments provided will become part of the public record for this permit application. All written comments, including contact information, will be made a part of the administrative record, available to the public under the Freedom of Information Act. The Administrative Record, or portions thereof, may also be posted on a Corps of Engineers internet web site. Due to resource limitations, this office will normally not acknowledge the receipt of comments or respond to individual letters of comment.

Any person may request, in writing via email, before this public notice expires, that a public hearing be held to collect information necessary to consider this application. Requests for public hearings shall state, with particularity, the reasons why a public hearing should be held. It should be noted that information submitted via email is considered just as carefully in the permit decision process and bears the same weight as that furnished at a public hearing.

The proposed project was reviewed based upon the "Biological Assessment for the Closure of the Mud Dump Site and Designation of the Historic Area Remediation Site (HARS) in the New York Bight and Apex," (USEPA, 1997). Based upon this review, and a review of the latest public listing of threatened and endangered species, the applicant has preliminarily determined that the proposed dredging and placement activities for which authorization is sought herein, may affect, but are not likely to adversely affect the following federally threatened or endangered species (Humpback Whales, Finback Whales, Right Whales, Loggerhead Turtles, Leatherback Turtles, Green Turtles, Kemp's Ridley Turtles, Atlantic Sturgeon and Shortnose Sturgeon) or their critical habitat pursuant to Section 7 of the Endangered Species Act (ESA; 16 USC 1531). Consultation with the National Marine Fisheries Service regarding ESA impacts and conservation recommendations is being conducted by the applicant and will be concluded prior to the final decision.

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires all federal agencies to consult with the National Marine Fisheries Service on all actions, or proposed actions, permitted, funded,

or undertaken by the agency, that may adversely affect Essential Fish Habitat (EFH). Consultation with the National Marine Fisheries Service regarding EFH impacts and conservation recommendations is being conducted by the applicant and will be concluded prior to the final decision.

Based upon a review of the latest published version of the National Register of Historic Places, the only known wrecks on or eligible for inclusion on the National Register at the HARS are located in Primary Remediation Area Number 1. As noted in the designation of the HARS, Remediation Material would not be allowed to be placed within 0.27 nautical miles of the identified wrecks or other wrecks that might be found. Otherwise, there are no known sites eligible for, or included in, the National Register within the proposed permit area.

Review of activities pursuant to Section 404 of the Clean Water Act will include application of the guidelines promulgated by the Administrator, U.S. Environmental Protection Agency, under authority of Section 404 (b) of the Clean Water Act. The applicant has requested a water quality certificate from the New Jersey Department of Environmental Protection in accordance with Section 401 of the Clean Water Act.

Pursuant to Section 307 (c) of the Coastal Zone Management Act of 1972 as amended [16 U.S.C. 1456 (c)], for activities under consideration that are located within the coastal zone of a state which has a federally approved coastal zone management program, the applicant has certified in the permit application that the activity complies with, and will be conducted in a manner that is consistent with, the approved state coastal zone management program. The applicant has requested concurrence to their coastal zone management consistency determination from the New Jersey Department of Environmental Protection. For activities within the coastal zone of New Jersey State, the applicant's certification and accompanying information is available from the New Jersey Department of Environmental Protection, Coastal Management Program, P.O. Box 418, 401 E. State Street, Trenton, NJ, 08625, Telephone (609) 633-2201. Comments regarding the applicant's certification, and copies of any letters to this office commenting upon this proposal, should be so addressed.

The proposed work is being coordinated with the following federal, state, and local agencies:

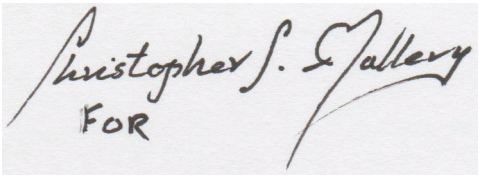
US Environmental Protection Agency;
US Department of the Interior, Fish and Wildlife Service;
US Department of Commerce, National Marine Fisheries Service;
US Coast Guard;
New Jersey Department of Environmental Protection

It is requested that you communicate the foregoing information concerning this activity to any persons known by you to be interested and who did not receive a copy of this notice.

If you have any questions concerning this application, you may contact this office at (917) 790-8516 and ask for Mr. William T. Bruno. Questions about the HARS can be addressed to Mr. Mark Reiss, Chief, Dredging, Sediments and Oceans Section, Water Division, US Environmental Protection Agency, Region 2 at (212) 637-3799 or email at Reiss.Mark@epa.gov.

*****PLEASE USE THE 18-CHARACTER FILE NUMBER ON ALL CORRESPONDENCE WITH THIS OFFICE*****

In order for us to better serve you, please complete our Customer Service Survey located at http://www.nan.usace.army.mil/Missions/Regulatory/CustomerSurvey.aspx. Formore information on New York District Corps of Engineers programs, visit our website at http://www.nan.usace.army.mil.



Stephan A. Ryba
Chief, Regulatory Branch

Encl

*****PLEASE USE THE 18-CHARACTER FILE NUMBER ON ALL CORRESPONDENCE WITH THIS OFFICE*****

DESCRIPTION OF PROPOSED WORK

The applicant, the Department of the Navy, has requested a Department of the Army permit to perform the following activities located in Sandy Hook Bay and the Atlantic Ocean, at Middletown Township, Monmouth County, New Jersey:

- Maintenance dredging of the previously authorized dredging areas, the shipping berths, the turning basin, the terminal channel and a portion of the Sandy Hook Federal Channel for a period of three years; and,
- Subsequent placement of the dredged material at the Atlantic Ocean Historic Area Remediation Site (HARS) for the purpose of remediation.

The proposed maintenance dredging work would be conducted via two clamshell dredges to a depth of -45 feet Mean Lower Low Water (MLLW) Datum, plus the standard 2 feet of overdepth dredging for a maximum dredging depth of -47 feet Mean Lower Low Water (MLLW) Datum including the shipping berth, the turning basin, the terminal channel and a portion of the Sandy Hook Federal Channel, producing a total volume of dredged material of approximately 2,219,770 cubic yards (CY) of dredged material. The dredged material would be placed into split-hull and/or bottom dumping scows maneuvered using a tugboat. Barge overflow is anticipated, as proposed at this time. The applicant requests that all the proposed dredged material be permitted for placement as Remediation Material at the HARS in the Atlantic Ocean off of Sandy Hook, New Jersey.

The proposed dredging operation has been divided into nine (9) proposed dredging areas, Dredging Areas B1, B2, C1, C2, D, E, F, G and H, and would be conducted in two dredging phases. During Dredging Phase I, the piers, turning basin and a portion of the Sandy Hook Channel (Areas B1, B2 and C1) would be dredged in Summer 2021; and during Dredging Phase II, the remainder of the Sandy Hook Channel (Areas C2, D, E, F, G and H) would be dredged in Summer 2022 if the work is not completed during Summer 2021.

- Dredging Area B1 is located within the ship turning basin, beginning at Station 449+375.5 and extends to Station 470+17.6 and totals 510,322 CY of sediment including a 2-foot overdepth over an area of 205,156 square yards (SY);

- Dredging Area B2 is located within the ship turning basin, and at Pier 3A and Pier 4, beginning at Station 470+17.6 and extends to Station 486+27.3 and totals 575,256 CY of sediment including a 2-foot overdepth over an area of 258,109 SY;

- Dredging Area C1 is located within the Sandy Hook Federal Channel, beginning at Station 382+51.4 and extends to Station 449+37.5, totaling 78,901 CY of sediment, including a 2-foot overdepth, over an area of 512,574 SY;

- Dredging Area C2 is located within the Sandy Hook Federal Channel, beginning at Station 350+09 and extends to Station 382+51.4 and totals 11,897 CY of sand, including a 2-foot overdepth, over an area of 295,815 SY;

- Dredging Area D is located within the Sandy Hook Federal Channel, beginning at Station 292+31 extending to Station 350+09 and located approximately 300 feet from the MLLW line from the tip of the sand spit of Sandy Hook, totaling 196,327 CY of sand, including a 2-foot overdepth, over an area of 513,754 SY;

- Dredging Area E is located within the Sandy Hook Federal Channel, beginning at Station 235+88 and extends to Station 292+31 and totals 393,740 CY of sand, including a 2-foot overdepth, over an area of 495,069 SY;

- Dredging Area F is located within the Sandy Hook Federal Channel, beginning at Station 202+76 and extends to Station 235+88 and totals 85,165 CY of sand, including a 2-foot overdepth, over an area of 219,839 SY;

- Dredging Area G is located within the Sandy Hook Federal Channel, beginning at Station 61+98 and extends to Station 202+76 and totals 205,155 CY of sand, including a 2-foot overdepth, over an area of 469,279 SY; and,

- Dredging Area H is located within the Sandy Hook Federal Channel, beginning at Station 61+98 and extends to Station 202+76 and totals 163,009 CY of sand, including a 2-foot overdepth, over an area of 468,522 SY.

These proposed nine dredging areas have a total volume of 2,219,770 CY of dredged material, of which a total of 1,055,292 CY of dredged material is comprised of sand. The total dredging area is approximately 3,597,504 square yards (743.29 acres).

Two phases of sampling were conducted to determine if the dredged material was suitable for placement at the Historic Area Remediation Site (HARS). Phase 1 of the sampling program was conducted in May/June 2020, and included physical characterization of sediments from forty-two (42) locations from Dredging area C2 through H. The purpose of the Phase 1 sampling program was to determine the need for additional HARS testing for channel reaches offshore of the installation. It was anticipated that the material in Dredging Areas C2 through H would meet the exclusionary criteria for placement at the HARS, with a composition of greater than 88% sand. Results of the Phase 1 physical analysis of Dredging Areas C2 though H were submitted to US Army Corps of Engineers (USACE) and Environmental Protection Agency (USEPA) to determine if the Dredging Areas C2 through H met the exclusionary requirement of greater than 88% sand.

The U.S. Environmental Protection Agency Region 2 and the U.S. Army Corps of Engineers New York District have evaluated bathymetric surveys, bottom sediment core logs and ocean currents data from Dredging Areas C2 through H to determine whether the proposed dredged material meets the criteria for ocean placement without additional testing as described in the Ocean Dumping Regulations at 40 CFR 227.13(b)(1). As specified in the regulations, the proposed dredged material satisfies these criteria if it is composed predominantly of sand, gravel, rock or any other naturally occurring bottom material with particle sizes larger than silt, and the material is found in areas of high current or wave energy such as streams with large bed loads or coastal areas with shifting bars and channels. The U.S. Environmental Protection Agency Region 2 and the U.S. Army Corps of Engineers New York District evaluation has shown that sand to be dredged from Dredging Areas C2 through H meets the requirements of 40 CFR 227.13(b)(1) and is suitable for placement in the ocean at the Historic Area Remediation Site (HARS) as Remediation Material without additional evaluation.

Phase 2 sampling efforts were conducted in June 2020 to obtain the necessary volume of project sediments from the three Dredging Areas B1, B2 and C1, to support HARS testing. The overall purpose of the Phase 2 sampling efforts was to obtain replicate cores to provide a complete representative cross-section of the proposed dredging prism and to provide requisite volume of sediments to perform the physical, chemical and ecotoxicological testing in accordance with USACE-New York District and USEPA Region 2 requirements. Sediment cores obtained from

each location were advanced to the proposed project depth of -45 feet MLLW plus 2 feet of overdepth. Results of the Phase 2 analysis of Dredging Areas B1, B2 and C1 are discussed in this public notice.

Consideration is being given to issuance of a three-year permit for the maintenance of the authorized dredging areas. Subsequent to an initial dredging cycle, the applicant would have to request authorization to perform maintenance dredging during the remaining life of the permit. Such authorization is dependent on the applicant demonstrating that each maintenance event requiring placement at the HARS is in compliance with the Ocean Dumping Regulations cited at 40 CFR Sections 220 - 229 in effect at that time, and will be dependent upon the availability of an approved disposal or remediation site.

The purpose of this proposed dredging is to allow for safe navigation of the US Navy ships to and from the installation.

INTRODUCTION TO THE HISTORIC AREA REMEDIATION SITE (HARS):

In 1972, the Congress of the United States enacted the Marine Protection, Research and Sanctuaries Act (MPRSA) to address and control the dumping of materials into ocean waters. Title I of the Act authorized the US Environmental Protection Agency (USEPA) and the US Army Corps of Engineers (USACE) to regulate dumping in ocean waters. The USEPA and the USACE share responsibility for MPRSA permitting and ocean disposal site management. Regulations implementing MPRSA can be found at 40 CFR Sections 220 through 229. With few exceptions, MPRSA prohibits the transportation of material from the United States for the purpose of ocean dumping except as may be authorized by a permit issued under the MPRSA. The MPRSA divides permitting responsibility between the USEPA and USACE. Under Section 102 of the MPRSA, USEPA has responsibility for issuing permits for all materials other than dredged material. Under Section 103 of MPRSA, the Secretary of the Army has the responsibility for issuing permits for dredged material. Determinations to issue MPRSA permits for dredged material are subject to USEPA concurrence.

In the fall of 1997, the USEPA de-designated and terminated the use of the New York Bight Dredged Material Disposal Site (commonly known as the Mud Dump Site or MDS). The MDS had been designated in 1984 for the disposal of up to 100 million CY of dredged material from navigation channels and other port facilities within the Port of New York and New Jersey. Simultaneous with the closure of the MDS, the site and surrounding areas that had been used historically as disposal sites for dredged materials were re-designated as the HARS under authority of Section 102(c) of MPRSA at 40 CFR Sections 228.15(d)(6) (See 62 Fed. Reg. 46142 (August 29, 1997); 62 Fed. Reg. 26267 (May 13, 1997). The HARS will be managed to reduce impacts of historic disposal activities at the site to acceptable levels in accordance with 40 CFR Section 228.11(c). The need to remediate the HARS is supported by the presence of toxic effects, dioxin bioaccumulation exceeding Category 1 levels in worm tissue (a definition of which appears in a memorandum reviewing the results of the applicant's testing), as well as TCDD/PCB contamination in area lobster stocks. Individual elements of those data do not establish that sediments within the Study Area are imminent hazards to the New York Bight Apex ecosystem, living resources, or human health. However, the collective evidence presents cause for concern, and justifies the need for remediation. Further information on the conditions in the Study Area and the surveys performed may be found in the Supplemental Environmental Impact Statement (USEPA, 1997).

The designation of the HARS identifies an area in and around the former Mud Dump Site (MDS) that has exhibited the potential for adverse ecological impacts. The HARS will be remediated with dredged material that meets current Category 1 standards and will not cause significant undesirable effects including through bioaccumulation or unacceptable toxicity, in accordance with 40 CFR 227.6. This dredged material is referred to as "Material for Historic Area Remediation Site (HARS)" or "Remediation Material."

As of the end of January 2021, dredged materials from one hundred and thirty-five (135) different completed and ongoing private and federal dredging projects in the Port of New York and New Jersey have been dredged and placed as Remediation Material in the ocean at the HARS since the closure of the Mud Dump Site and designation of the HARS in 1997. This represents approximately 78,239,000 CY of Remediation Material.

The HARS, which includes the 2.2 square nautical mile area of the MDS, is an approximately 15.7 square nautical mile area located approximately 3.5 nautical miles east of Highlands, New Jersey and 7.7 nautical miles south of Rockaway, New York. The MDS is located approximately 5.3 nautical miles east of Highlands, New Jersey and 9.6 nautical miles south of Rockaway, New York. When determined by bathymetry (a map depicting the relative depths of water in a particular area) that capping is complete, the USEPA will take any necessary rulemaking to de-designate the HARS. The HARS includes the following three areas:

Priority Remediation Area (PRA): A 9.0 square nautical mile area to be remediated with at least 1 meter of Remediation Material. The PRA encompasses the area of degraded sediments as described in greater detail in the SEIS.

Buffer Zone: An approximately 5.7 square nautical mile area (0.27 nautical mile wide band around the PRA) in which no placement of the Material for Remediation will be allowed, but may receive Material for Remediation that incidentally spreads out of the PRA.

No Discharge Zone: An approximately 1.0 square nautical mile area in which no placement or incidental spread of Material for Remediation is allowed.

To improve management and monitoring of placement activities at the HARS, electronic monitoring equipment will be on-board any barges carrying Remediation Material to the HARS. This equipment records vessel positions and scow drafts throughout the duration of each trip to the HARS and during remediation operations. To improve communication reliability between tugs and scows, a prescribed formal communication procedure has been put in place (copies of this procedure are available upon request).

Additional information concerning the HARS can be obtained from Mr. Mark Reiss, Chief, Dredging, Sediments and Oceans Section, Water Division, US Environmental Protection Agency, Region 2 at (212) 637-3799.

HARS SUITABILITY TESTING:

A testing evaluation process was developed, which established a basic framework for assessing results of tissue analysis from bioaccumulation testing of dredged material proposed for ocean placement. The framework defines a standard approach for assessing each analyte (an item to be analyzed for as part of the testing), in relation to regulatory standards and human health, and environmental risk factors, to facilitate decisions in accordance with the Marine Protection, Research, and Sanctuaries Act of 1972. USEPA and USACE utilize this testing evaluation

process for identifying Category 1 dredged material in determining suitability of dredged materials as material for remediation at the HARS. The Testing Evaluation Memo for this project may be obtained by contacting Mr. Mark Reiss, Chief, Dredging, Sediments and Oceans Section, Water Division, US Environmental Protection Agency, Region 2 at (212) 637-3799.

Sediment Grain Size Analysis:

As depicted on the attached drawings, the proposed maintenance dredging was divided into nine areas for purposes of sampling and testing. The dredged material proposed for placement at the HARS was characterized by ten sediment core samples taken in Dredging Area B1, ten sediment core samples taken in B2, five sediment core samples taken in C1, two sediment core samples taken in C2, seven sediment core samples taken in D, eleven sediment core samples takin in E, four sediment core samples takin in F, 9 sediment core samples taken in G and 9 sediment cores samples taken in H. The ten samples from Dredging Area B1, ten samples from B2 and five samples from C1 were than combined into three separate composites which were subject to physical, chemical and biological testing

Based upon an analysis of sediment samples from the project area submitted by the applicant and their contract laboratory, the grain size characteristics of the proposed dredged material is:

Area B1	0% gravel	4% sand	53% silt	43% clay
Area B2	0% gravel	3% sand	56% silt	41% clay
Area C1	0% gravel	53% sand	37% silt	10% clay
Area C2	1.1% gravel	95% sand	2.7% silt	2.1% clay
Area D	3.0% gravel	90.9% sand	3.4% silt	2.6% clay
Area E	1.7% gravel	93.1% sand	3.3% silt	1.8% clay
Area F	0.75 % gravel	97% sand	0.5% silt	1.4% clay
Area G	1.1% gravel	95% sand	1.6% silt	2.3% clay
Area H	1.7% gravel	93% sand	1.8% silt	3.3% clay

Results of the chemical and biological testing for Phase 2 - Dredging Areas B1, B2 and C1 are summarized below.

Evaluation of the liquid phase: Chemistry

Under the requirements of 40 CFR 227.6(c)(1) and 227.27(a), chemical analysis was conducted on project area site water and elutriate. Results of this evaluation are summarized in Table 1. Please note in reading Table 1 that detection limits have been listed for only those constituents which the laboratory reported as non-detected (ND) in the concentration column (this reporting convention was similarly applied in reporting the results of bioaccumulation potential testing discussed below). If the constituents were detected (above the detection limit), the measured value would appear.

Expected concentrations of chemical constituents in the water column following ocean placement, after allowing for initial mixing, were calculated using the Automated Dredging and Disposal Alternatives Management System (ADDAMS), a mixing model developed by the U.S. Army Corps of Engineers (USACE) Waterways Experiment Station (WES) and described in the joint USEPA/USACE implementation manual entitled "Evaluation of Dredged Material Proposed for Ocean Disposal" (commonly referred to as the National “Green Book”). The material can be considered suitable for ocean disposal only if the concentration of the Suspended Particulate Phase (SPP) of the dredged material, after allowance for the initial mixing, will not exceed the

Limiting Permissible Concentration (LPC) beyond the boundaries of the disposal site within the first four hours following HARS placement or at any point in the marine environment after the first four hours. The ADDAMS Model predicted that applicable marine water quality criteria for listed constituents were not exceeded after allowance for initial mixing [40 CFR 227.29(a)]. Results of this analysis indicate that the LPC will be met for the proposed dredged material from the project area.

Bioassays:

In accordance with 40 CFR Part 227 of the Ocean Dumping regulations, bioassays were performed to assess the toxicities of the suspended particulate, liquid, and solid phases of the proposed dredged material from the proposed project area.

Evaluation of the liquid phase:

Liquid phase bioassays run as part of the suspended particulate phase on three appropriate sensitive marine organisms: a crustacean (a mysid shrimp, Americamysis bahia), a finfish (Menidia beryllina), and the planktonic larvae of a bivalve (the blue mussel, Mytilus edulis), show that after initial mixing (as determined under 40 CFR Sections 227.29(a)(2)), the liquid phase of the material would not exceed a toxicity threshold of 0.01 of a concentration shown to be acutely toxic to appropriate sensitive marine organisms. Accordingly, it is concluded the liquid phase of the material would be in compliance with 40 CFR Sections 227.6(c)(1) and 227.27(a). The specific test results and technical analysis of the data underlying this conclusion are described and evaluated in a joint USACE New York District/US Environmental Protection Agency Region 2 memorandum (copies available upon request).

Evaluation of the suspended particulate phase:

The suspended particulate phase of the material was evaluated for compliance with 40 CFR Sections 227.6(c)(2) and 227.27(b). Bioassay testing of the suspended particulate phase of the material has been conducted using three appropriate sensitive marine organisms: the mysid shrimp, Americamysis bahia; a finfish, Menidia beryllina; and the planktonic larvae of a blue mussel, Mytilus edulis. Median lethal concentrations (LC50), those concentrations of suspended particulate phase resulting in 50% mortality, were determined for all three test species. In addition, the median effective concentration (EC50) based on normal larval development to the D-cell stage, was determined for bivalve larvae. The Limiting Permissible Concentration (LPC) was then calculated as 0.01 of the LC50 or EC50 of the most sensitive organism. In this case, the LPC was calculated at 0.31% for Reach B1, 0.30% for Reach B2 and 0.77% for Reach C1, based on the EC50 of M. edulis.

This information shows that when placed in the HARS, and after initial mixing (as determined under 40 CFR Sections 227.29(a)(2)), the suspended particulate phase of this material would not exceed a toxicity threshold of 0.01 of a concentration shown to be acutely toxic in the laboratory bioassays, and thus would not result in significant mortality. Moreover, the fact that after placement, the suspended particulate phase would only exist in the environment for a short time, means the suspended particulate phase of the reach would not cause significant undesirable effects, including the possibility of danger associated with bioaccumulation, since these impacts require long exposure durations (see USEPA, 1994). Accordingly, it is concluded that the suspended phase of the material would be in compliance with 40 CFR Sections 227.6(c)(2) and 227.27(b). The results of bioassay tests conducted on proposed dredged sediments are presented in Table 2 of this public notice.

Evaluation of the solid phase:

The solid phase tests the whole dredged material before it has undergone processing that might alter its chemical or toxicological properties. The solid phase was evaluated for compliance with 40 CFR Sections 227.6(c)(3) and 227.27(b). This evaluation was made using the results of two specific types of evaluations on the solid phase of the material, one focusing on the acute (10-day) toxicity of the material, and the other focusing on the potential for the material to cause significant adverse effects due to bioaccumulation. Both types of tests used appropriate sensitive benthic marine organisms according to procedures approved by USEPA and the USACE. The following sections address the results of those tests and further analyze compliance with the regulatory criteria of 40 CFR Sections 227.6(c)(3), 227.27(b), and 228.15 and with USEPA Region 2/USACE New York District guidance.

1. Toxicity:

Ten-day toxicity tests were conducted on proposed project dredged material using a filter feeding mysid shrimp (Americamysis bahia) and a deposit feeding, burrowing amphipod (Ampelisca abdita), which are appropriate sensitive benthic marine organisms. The results from the proposed project material are then compared to results for the same organisms that are exposed to reference sediments. The reference sediments represent existing background conditions in the vicinity of the HARS, removed from the influence of any placement operations. These organisms are good predictors of adverse effects to benthic marine communities (see USEPA, 1996). The toxicity of project sediments was not statistically greater than reference sediments for either mysid, or for amphipods, and the difference between percent survivals in test and reference sediments was less than 10% for mysid shrimp and less than 20% for amphipods.

These results show that the solid phase of the material would not cause significant mortality and meets the solid phase toxicity criteria of Sections 227.6 and 227.27. The results of the ten-day toxicity test are summarized in Table 2.

2. Bioaccumulation:

Bioaccumulation tests for the sediment were conducted on the solid phase of the project material for contaminants of concern using two appropriate sensitive benthic marine organisms: a burrowing, deposit-feeding polychaete, Alitta virens (formerly Nereis virens), and a filter-feeding bivalve, Macoma nasuta. These species are considered to be good representatives of the phylogenetically diverse base of the marine food chain. Contaminants of concern were identified for the regional testing manual from the NY/NJ Harbor Estuary Program Toxics Characterization report (Squibb, et al. 1991).

Table 3 of this Public Notice addresses the bioaccumulation of contaminants of concern. Additional information on more rigorous evaluations conducted on individual contaminant values may be found in the Testing Evaluation Memo for this project. Table 3 indicates that several contaminants bioaccumulated above reference in the clam and/or worm. All constituents identified in worm and clam tissue were compared to existing Food and Drug Administration (FDA) action levels for poisonous or deleterious substances in fish and shellfish for human food, regional disposal criteria, background concentrations, and risk-based criteria provided by USEPA. The testing memo further evaluates these contaminants, and concludes that any contaminant that exceeded reference did not exceed any existing regional matrix or dioxin values. Several contaminants which did not have matrix values did exceed background levels, but in no case did any contaminant accumulate to toxicologically important concentrations, even when very

conservative assumptions were used in the analysis. Any contaminants that exhibited bioaccumulation test results above reference were all below the acceptable human health risk range and acceptable aquatic effects range, again using conservative approaches and analyses. A discussion of this determination is available in the Testing Evaluation Memo for this permit applicant's dredging and disposal project. The bioaccumulation test results were used in evaluating the potential impacts of the material. The determination is that the combined results of the toxicity and bioaccumulation tests indicate that the material meets the criteria of 40 CFR Sections 227.6(c)(3) and 227.27(b) and 228.15(d)(6)(v)(A) of the Regulations, and that the material is suitable for placement at the HARS.

CONCLUSIONS:

Based upon the results of testing of the sediments proposed for dredging in the permit applicant's facility and ocean placement the USACE and USEPA have determined that the material is Category 1 meeting the criteria for ocean placement as described in 40 CFR Sections 227.6, 227.27, and 228.15, and is a Remediation Material as defined under the USEPA Region 2/USACE, New York District guidance. The specific test results and technical analysis of the data underlying this conclusion are described in the joint USACE, New York District/USEPA Region 2 memorandum mentioned previously.

Placement of this material at the HARS will serve to reduce impacts to acceptable levels and improve benthic conditions. Sediments in the HARS have been found to be acutely toxic to sensitive benthic marine organisms in laboratory tests, whereas project sediments used in laboratory acute toxicity tests with the same species were determined not to be toxic. Placement of project material over existing toxic sediments would serve to remediate those areas for toxicity. In addition, by covering the existing sediments in the site with this project material, surface dwelling organisms will be exposed to sediments exhibiting Category 1 qualities whereas the existing sediments exceed these levels.

ALTERNATIVES TO HARS PLACEMENT:

Regarding ocean placement of dredged material, the Ocean Dumping Regulations [Title 40 CFR Sections 227.16(b)] states that ". . . alternative methods of disposal are practicable when they are available at reasonable incremental cost and energy expenditures which need not be competitive with the costs of ocean dumping, taking into account the environmental impacts associated with the use of alternatives to ocean dumping . . ." The permit applicant has investigated the use of alternative placement sites for the dredged material that include beneficial use, upland placement, beach placement and open water placement. Beneficial uses such as upland placement at Liberty State Park in Jersey City, New Jersey were investigated but other sources of fill material were deemed more practicable. The applicant also investigated the use of upland placement of the dredged material at landfill sites including the Charles City Landfill in Port Tobacco, Virginia. However, upland disposal locations in the metropolitan area are extremely limited. In addition, upland storage space is limited thereby making upland placement not a practicable alternative. The applicant investigated the alternative of open water placement at the Sea Bright Offshore Borrow Area (SBOBA), however it was deemed unfeasible. Therefore, alternative sites for the placement of the dredged material are either not available or not available at reasonable incremental costs, thus leaving HARS placement as the applicant's preferred alternative.

COMMUNICATIONS:

For additional information regarding this project or the HARS contact Mr. William T. Bruno, Regulatory Project Manager, USACE, New York District at (917) 790-8516 or Mr. Mark Reiss, Chief, Dredging, Sediments and Oceans Section, Water Division, US Environmental Protection Agency, Region 2 at (212) 637-3799. If the determination is made to issue a permit, the permittee will contact the US Coast Guard with the details of the authorized work.

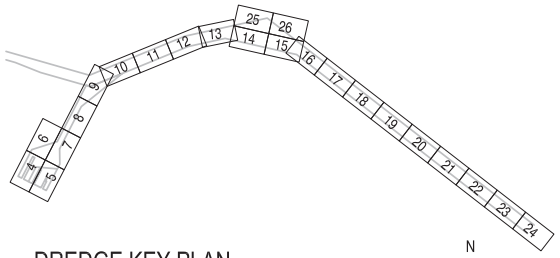
SITE PLAN
FOR
FY-2021 MAINTENANCE DREDGING AT EARLE
NAVAL WEAPONS STATION, COLTS NECK, NEW JERSEY

LIST OF SHEETS

HYDROGRAPHIC NOTES

1. SOUNDINGS ARE EXPRESSED IN FEET & TENTHS AND ARE REFERRED TO MEAN LOWER LOW WATER VERTICAL DATUM (2001 EPOCH).
2. ALL CONTOUR ELEVATIONS SHOULD BE CONSIDERED NEGATIVE UNLESS SPECIFIED AS POSITIVE.
3. HORIZONTAL POSITIONS ARE EXPRESSED IN FEET AND REFER TO THE U.S. STATE PLANE NAD 83 NEW JERSEY MERCATOR SYSTEM.
4. THE HYDROGRAPHIC SURVEY WAS CONDUCTED USING CLASS 1 HYDROGRAPHIC SURVEY METHODS & ACCURACIES OUTLINED IN THE CORPS OF ENGINEERS' HYDROGRAPHIC SURVEYING MANUAL (EM 1110-2-1003).
5. ALL SOUNDINGS WERE RECORDED USING A RESON 7125 MULTI-BEAM SONAR SYSTEM WITH HORIZONTAL POSITIONS OBTAINED VIA APPLANIX POS/MV GPS W/MRU.

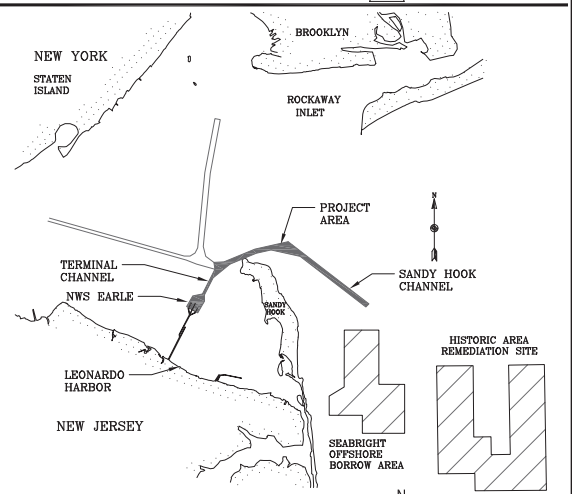
DREDGING KEY PLAN



DREDGE KEY PLAN

Scale: 1" = 5000'

LOCATION MAP 1



LOCATION MAP

NOT TO SCALE

NAVFAC

APPROVED BY: Digitally signed by GEORGO.JAMES.S.1392763089 Date: 2021.01.13 17:43:30 -05'00'

O-HYDRO TEAM MGR.

FOR REGULATORY AGENCY PERMIT APPLICATION SUBMITTAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

SATISFACTORY TO DATE

DES JSG | DRW JSG | CHK JSG

PM/TM M.A. FERMIN / J.S. GEORGO

BRANCH MANAGER DLB

CHIEF ENG/ARCH EJA

FIRE PROTECTION N/A

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND - MID ATLANTIC
DC CORE - HYDROGRAPHIC TEAM DC450 NS NORFOLK
NAVAL WEAPONS STATION EARLE COLTS NECK, NJ

FY 2021 MAINTENANCE DREDGING

TITLE SHEET

SCALE: AS NOTED

EPROJECT NO. 1652592

CONSTR. CONTR. NO.

NAVFAC DRAWING NO. 12805425

SHEET 1 OF 26

V-001

DRAWFORM REVISION: 07 AUG 2018

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FILE NAME: C:\Users\jgeo\Documents\VGSDC_Current_Projects\NWS Earle FY21 Maintenance Dredging\CAD\1652592_FY21 NWS Earle Maint_Dredging_Permit_Dwgs.dwg LAYOUT NAME: V-001 PLOTTED: Tuesday, November 24, 2020 - 8:42am USER: jgeo

USACE FILE: NAN-2019-01440-EBR

ESTIMATED DREDGING VOLUMES (1)
(INCL. ADDL. SILTATION PROJECTED TO JUNE 2022)

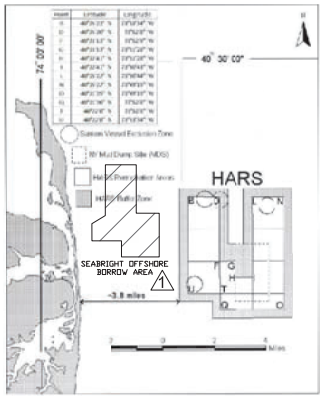
Location	Starting Station	Ending Station	Dredge Area (SY)	Dredging Footprint Area per June 2020 Bathymetric Survey (SY)	Project Depth (MLLW)	Maximum Overdredge Depth (MLLW)	Volume (CY)		
							Project Depth	2' OD Depth	Total
AREA B1	449+37.5	470+17.6	364,544	205,156	-45	-47	322,239	188,083	510,322
AREA B2	470+17.6	486+27.3	258,109	258,109	-45	-47	397,001	178,255	575,256
AREA C1	382+51.4	449+37.5	512,574	23,438	-45	-47	24,594	54,307	78,900
AREA C2	350+09	382+51.4	295,815	3,324	-45	-47	4,062	7,835	11,897
AREA D	292+31	350+09	513,754	10,389	-45	-47	134,361	61,966	196,327
AREA E	235+88	292+31	495,069	74,346	-45	-47	192,270	201,470	393,740
AREA F	202+76	235+88	219,839	22,284	-45	-47	35,939	49,225	85,165
AREA G	61+98	202+76	469,279	52,371	-45	-47	73,145	132,010	205,155
AREA H	61+98	202+76	468,522	64,198	-45	-47	67,796	95,213	163,009
Volume Sub Totals							**1,251,406**	**968,364**	**2,219,770**
Dredge Areas Total			**3,597,504**	**713,614**					**Total Volume**

NOTES FOR THIS TABLE:

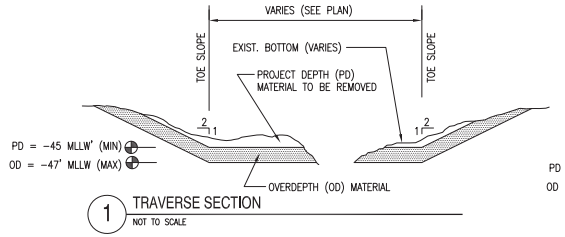
1. QUANTITIES INCLUDE MATERIAL IN PRISMS TO FORM SLOPES.
2. NIC: ALL MATERIAL BELOW OVERDEPTH AND OUTSIDE DREDGE PRISM TEMPLATE.
3. PROJECTED SILTATION RATE APPLIED TO JUNE 2020 SOUNDINGS TO ESTIMATE VOLUMES TO JUNE 2022 PROJECT EXECUTION.
4. ESTIMATED OVERDREDGE VOLUMES ARE BASED UPON AREAS WHERE PROJECTED DEPTHS ARE ABOVE REQUIRED PROJECT DEPTH.

TYPICAL ABBREVIATIONS

CY	CUBIC YARD
DWGS	DRAWINGS
ELEV, EL	ELEVATION
EXIST	EXISTING
MHW	MEAN HIGH WATER
MHHW	MEAN HIGHER HIGH WATER
MLW	MEAN LOW WATER
MLLW	MEAN LOWER LOW WATER
NAVD	NORTH AMERICAN VERTICAL DATUM
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NIC	NOT IN CONTRACT
OD	MAX. ALLOWABLE OVER DREDGE DEPTH
PD	MIN. REQUIRED PROJECT DREDGE DEPTH
STA	STATION
TBM	TEMPORARY BENCHMARK
T/S	TOE OF SLOPE



HISTORIC AREA REMEDIATION SITE (HARS) COORDINATE LOCATION



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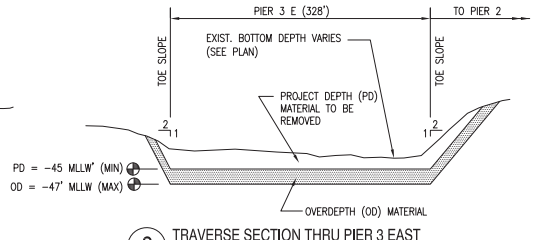
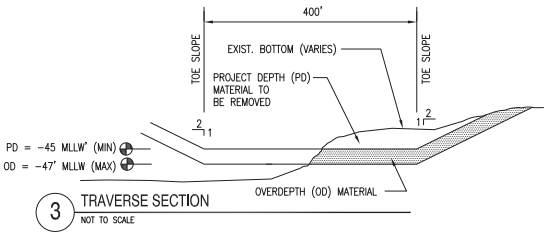


2 TRAVERSE SECTION THRU PIER 3 EAST
NOT TO SCALE



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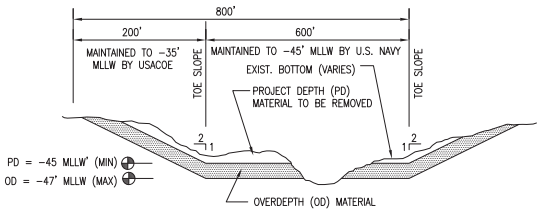

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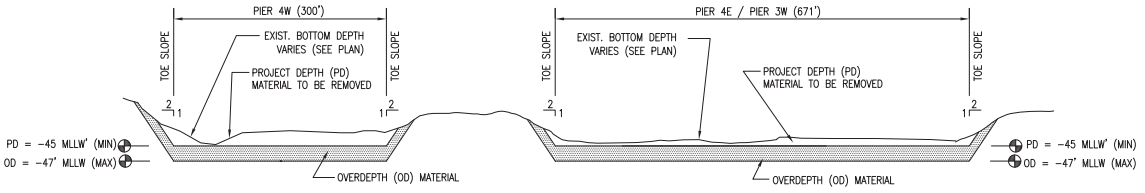

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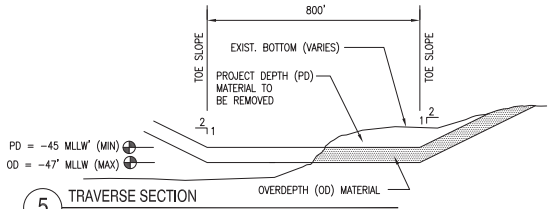

5 TRAVERSE SECTION
NOT TO SCALE

NO	DESCRIPTION	DATE	APPR
1	VOL TABLE REV PER NAVF QC-02-21 COMMENTS	02-09-21	JSG

NAVFAC

APPROVED BY
O-HYDRO TEAM MGR.
A/E INFO
APPROVED
FOR COMMANDER NAVFAC
ACTIVITY
SATISFACTORY TO DATE
DES JSG DRW JSG CHK JSG
PM/TM M.A. FERMIN / J.S. GEORGO
BRANCH MANAGER DLB
CHIEF ENG/ARCH EJA
FIRE PROTECTION N/A

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND – MID ATLANTIC
DC CORE - HYDROGRAPHIC TEAM DC450 COUTS NECK, NS NORFOLK
NAVAL WEAPONS STATION EARLE

FY 2021 MAINTENANCE DREDGING

DETAILS

SCALE: AS NOTED
EFP/PROJECT NO. 1652592
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12805426
SHEET 2 OF 26
V-002
DRAWFORM REVISION: 07 AUG 2018

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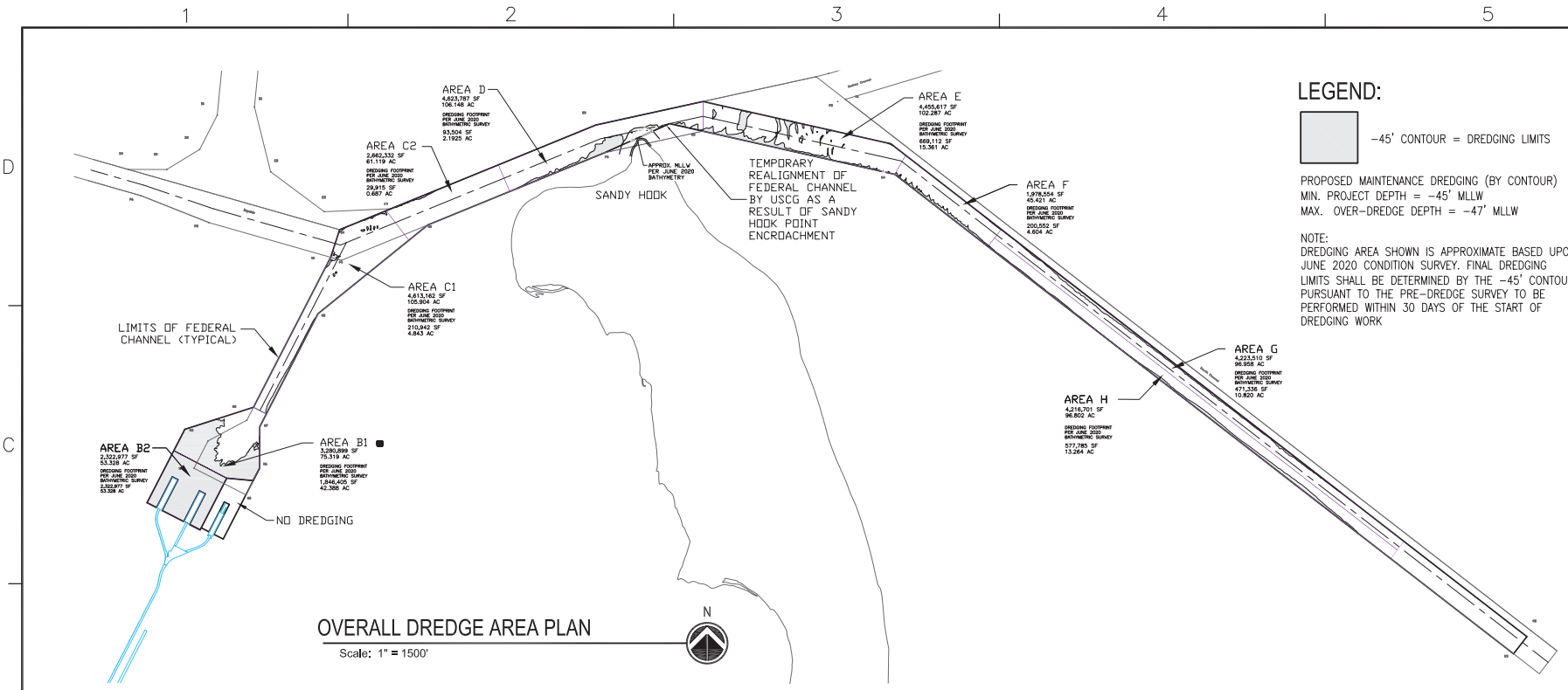
FILE NAME: C:\Users\jgeo\Documents\JGSDC_Current_Projects\NMS Earle FY21 Maintenance Dredging\CAD\1652592_FY21 NMS Earle Maint_Dredging_Permit_Drwgs.dwg LAYOUT NAME: V-002 PLOTTED: Tuesday, February 09, 2021 - 11:59am USER: jgeo

USACE FILE: NAN-2019-01440-EBR



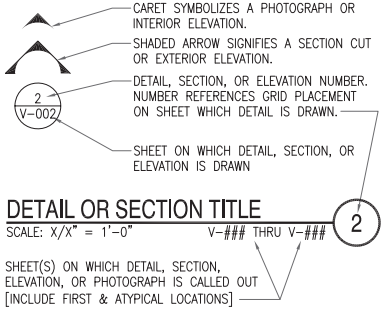
LEGEND:

−45' CONTOUR = DREDGING LIMITS

PROPOSED MAINTENANCE DREDGING (BY CONTOUR)
MIN. PROJECT DEPTH = −45' MLLW
MAX. OVER-DREDGE DEPTH = −47' MLLW

NOTE:
DREDGING AREA SHOWN IS APPROXIMATE BASED UPON JUNE 2020 CONDITION SURVEY. FINAL DREDGING LIMITS SHALL BE DETERMINED BY THE −45' CONTOUR PURSUANT TO THE PRE-DREDGE SURVEY TO BE PERFORMED WITHIN 30 DAYS OF THE START OF DREDGING WORK

SYMBOLS LEGEND



TYPICAL ABBREVIATIONS

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DWGS	DRAWINGS
ELEV, EL	ELEVATION
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MHW	MEAN HIGH WATER
MHHW	MEAN HIGHER HIGH WATER
MLW	MEAN LOW WATER
MLLW	MEAN LOWER LOW WATER
NAVD	NORTH AMERICAN VERTICAL DATUM
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NIC	NOT IN CONTRACT
OD	MAX. ALLOWABLE OVER DREDGE DEPTH
PD	MIN. REQUIRED PROJECT DREDGE DEPTH
STA	STATION
TBM	TEMPORARY BENCHMARK
T/S	TOE OF SLOPE

GENERAL NOTES

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND – MID ATLANTIC
DC CORE - HYDROGRAPHIC TEAM DC450 COLTS NECK, NJ
NAVAL WEAPONS STATION EARLE NS NORFOLK

FY 2021 MAINTENANCE DREDGING

GENERAL NOTES, LEGEND AND OVERALL DREDGE AREA PLAN

SCALE: AS NOTED
EFPROJECT NO. 1652592
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12805427
SHEET 3 OF 26
V-003
DRAWFORM REVISION: 07 AUG 2018

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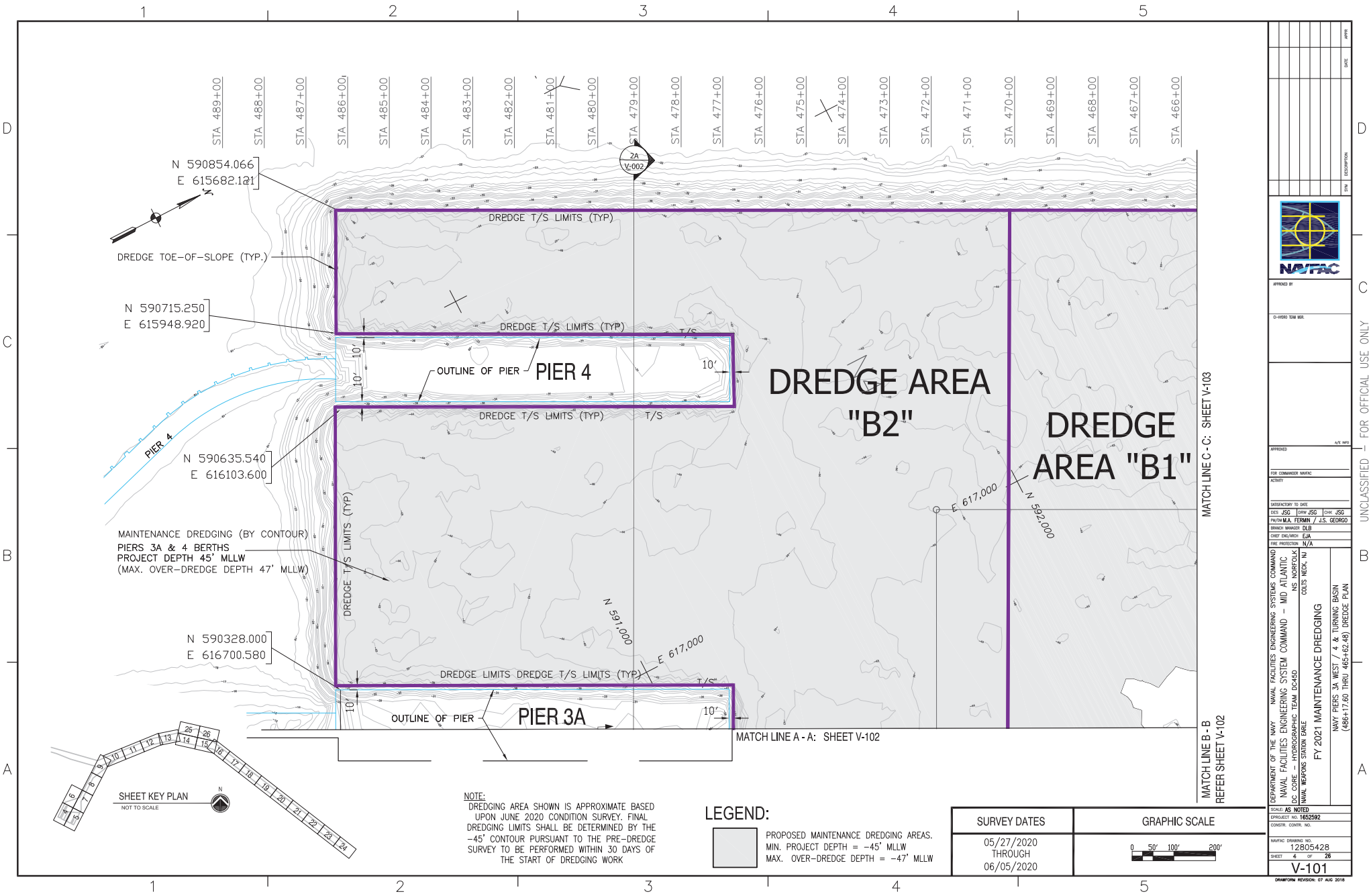

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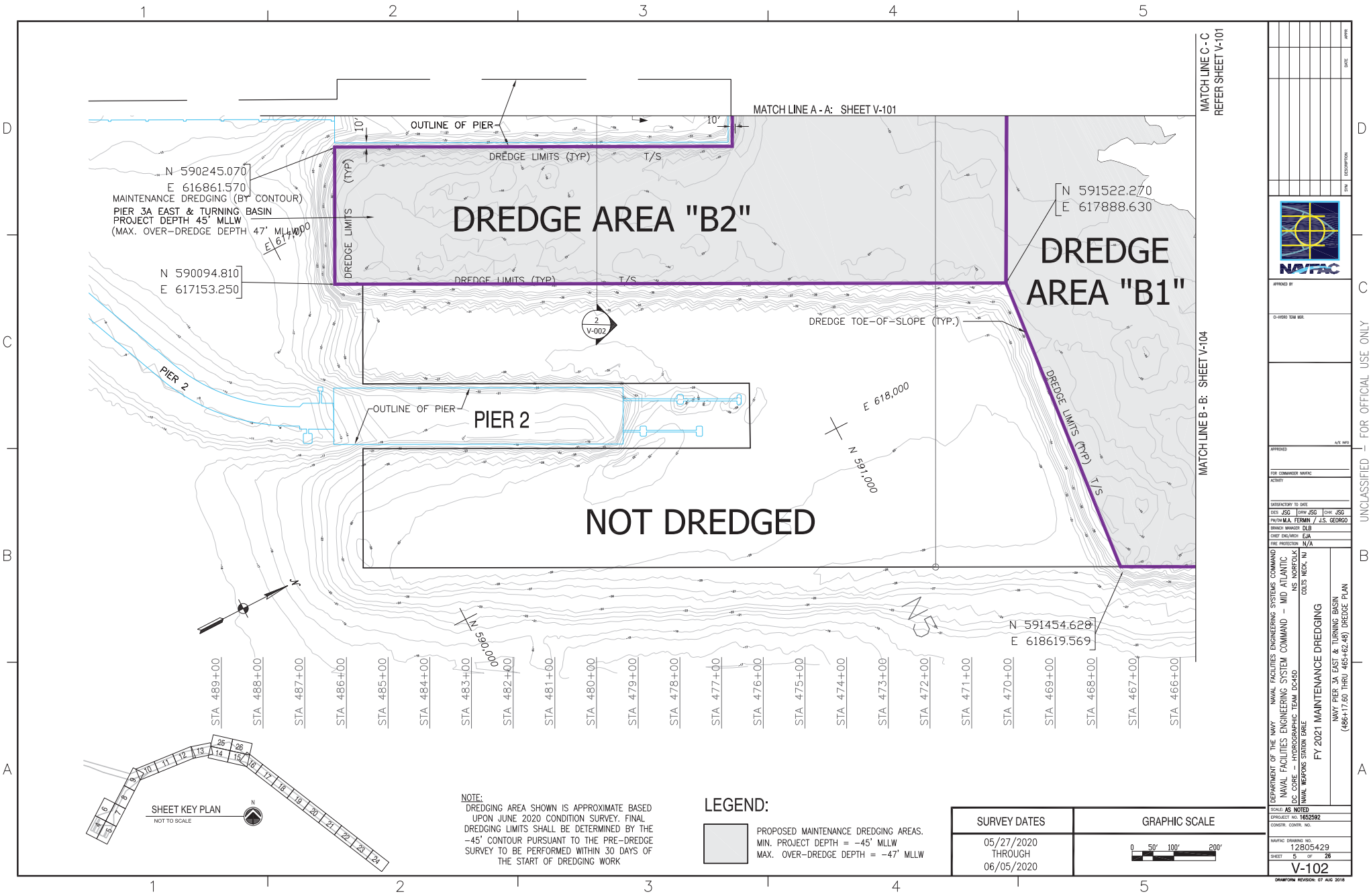

NOTE:
DREDGING AREA SHOWN IS APPROXIMATE BASED UPON JUNE 2020 CONDITION SURVEY. FINAL DREDGING LIMITS SHALL BE DETERMINED BY THE -45' CONTOUR PURSUANT TO THE PRE-DREDGE SURVEY TO BE PERFORMED WITHIN 30 DAYS OF THE START OF DREDGING WORK

LEGEND:

PROPOSED MAINTENANCE DREDGING AREAS.
MIN. PROJECT DEPTH = -45' MLLW
MAX. OVER-DREDGE DEPTH = -47' MLLW

SURVEY DATES	GRAPHIC SCALE
05/27/2020 THROUGH 06/05/2020	0 50' 100' 200'

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND - MID ATLANTIC
DC CORE - HYDROGRAPHIC TEAM DC450 COUTS NECK, NS NORFOLK
NAVAL WEAPONS STATION EARLE

FY 2021 MAINTENANCE DREDGING
NAVY PIER 3A EAST & TURNING BASIN
(486+17.60 THRU 465+62.48) DREDGE PLAN

SCALE: AS NOTED
EPROJECT NO. 1652592
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12805429
SHEET 5 OF 26
V-102
DRAWFORM REVISION: 07 AUG 2018

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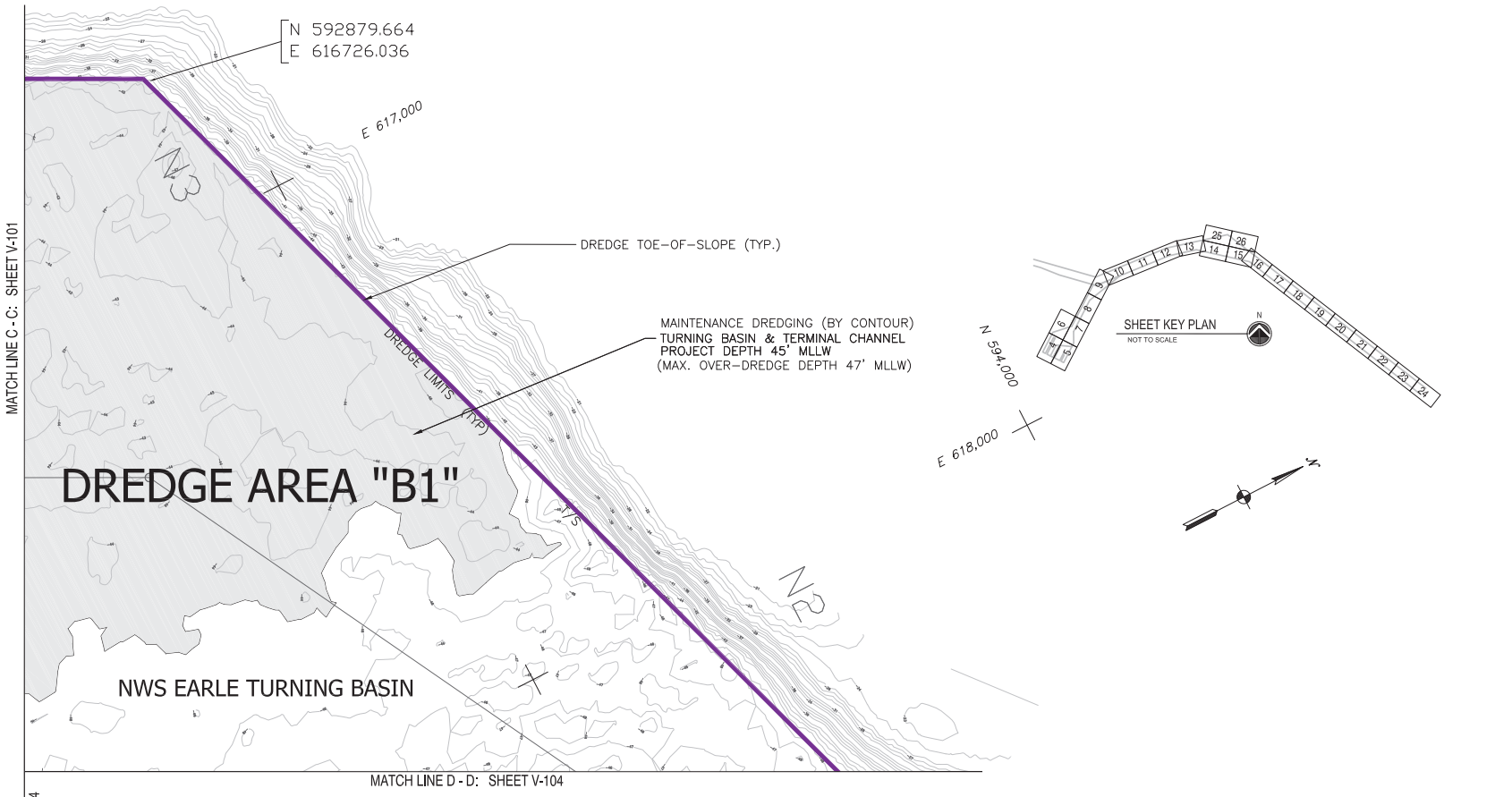

NOTE:
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LEGEND:

PROPOSED MAINTENANCE DREDGING AREAS.
MIN. PROJECT DEPTH = -45' MLLW
MAX. OVER-DREDGE DEPTH = -47' MLLW

SURVEY DATES	GRAPHIC SCALE
05/27/2020 THROUGH 06/05/2020	0 50' 100' 200'

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND - MID ATLANTIC
DC CORE - HYDROGRAPHIC TEAM DC45D COLTS NECK, NJ NS NORFOLK
NAVAL WEAPONS STATION EARLE

FY 2021 MAINTENANCE DREDGING

TURNING BASIN - WEST
(465+56.48 THRU 450+97.99) DREDGE PLAN

SCALE: AS NOTED
EPROJECT NO. 1652592
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12805430
SHEET 6 OF 26
V-103
DRAWFORM REVISION: 07 AUG 2018

DES JSG DRW JSG CHK JSG
PM/TM M.A. FERMIN / J.S. GEORGO
BRANCH MANAGER D.L.B.
CHIEF ENG/ARCH E.A.
FIRE PROTECTION N/A

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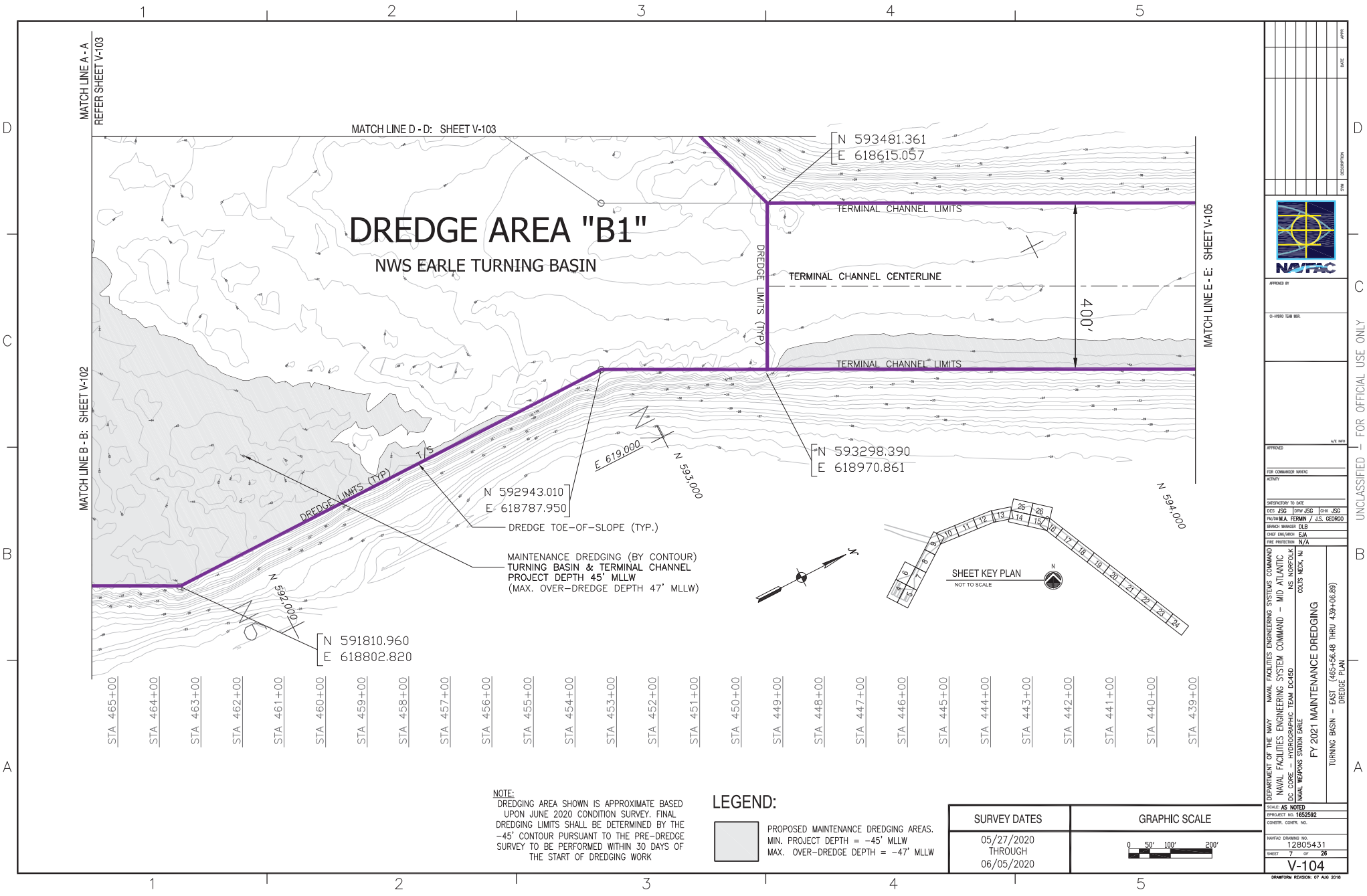

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LEGEND:

PROPOSED MAINTENANCE DREDGING AREAS.
MIN. PROJECT DEPTH = -45' MLLW
MAX. OVER-DREDGE DEPTH = -47' MLLW

SURVEY DATES	GRAPHIC SCALE
05/27/2020 THROUGH 06/05/2020	0 50' 100' 200'

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND - MID ATLANTIC
DC CORE - HYDROGRAPHIC TEAM DC450 NAVAL WEAPONS STATION EARLE COLTS NECK, NJ NORFOLK

FY 2021 MAINTENANCE DREDGING
TURNING BASIN - EAST (465+56.48 THRU 439+06.89)
DREDGE PLAN

SCALE: AS NOTED
EPROJECT NO. 1652592
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12805431
SHEET 7 OF 26
V-104
DRAWFORM REVISION: 07 AUG 2018

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PM/TM M.A. FERMIN / J.S. GEORGO
BRANCH MANAGER DLB
CHIEF ENG/ARCH EJA
FIRE PROTECTION N/A

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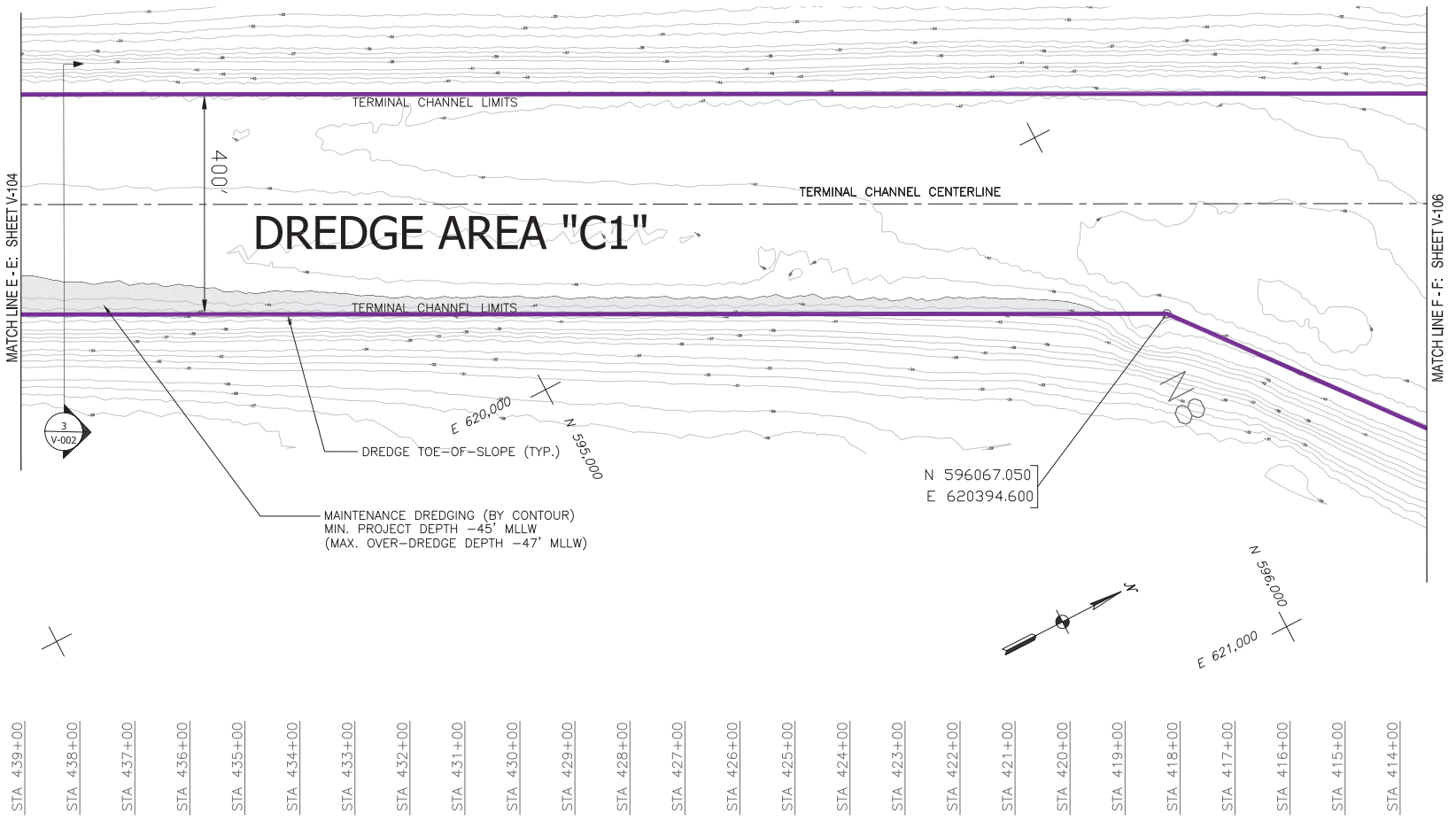

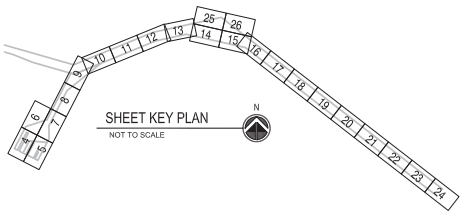

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LEGEND:

PROPOSED MAINTENANCE DREDGING AREAS.
MIN. PROJECT DEPTH = -45' MLLW
MAX. OVER-DREDGE DEPTH = -47' MLLW

SURVEY DATES	GRAPHIC SCALE
05/27/2020 THROUGH 06/05/2020	0 50' 100' 200'

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND - MID ATLANTIC
DC CORE - HYDROGRAPHIC TEAM DC450 COUTS NECK, NJ
NAVAL WEAPONS STATION EARLE NS NORFOLK

FY 2021 MAINTENANCE DREDGING
TERMINAL CHANNEL (439+06.89 THRU 413+40.46)
DREDGE PLAN

SCALE: AS NOTED
EPROJECT NO. 1652592
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12805432
SHEET 8 OF 26
V-105

DRAWFORM REVISION: 07 AUG 2018

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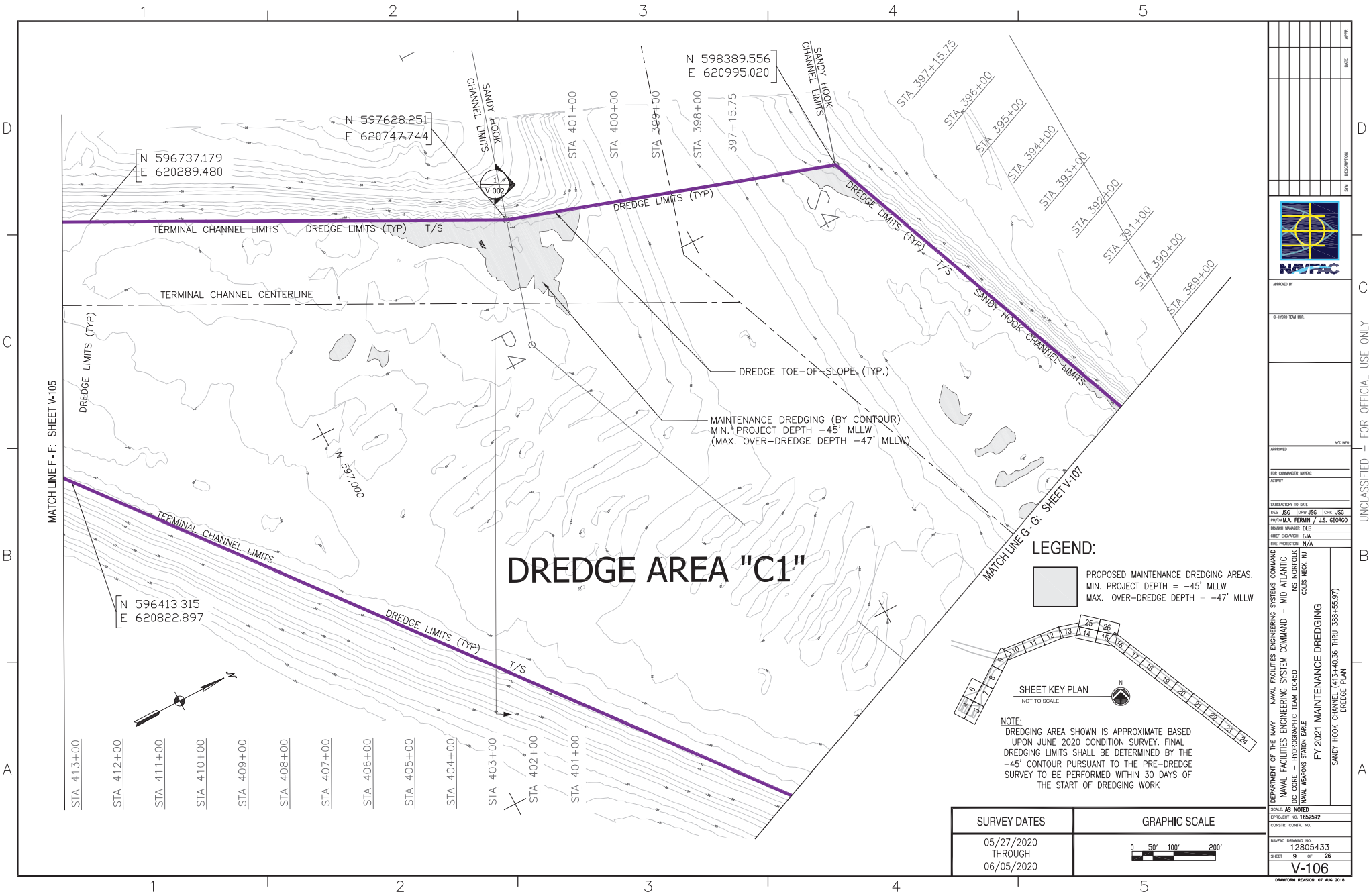

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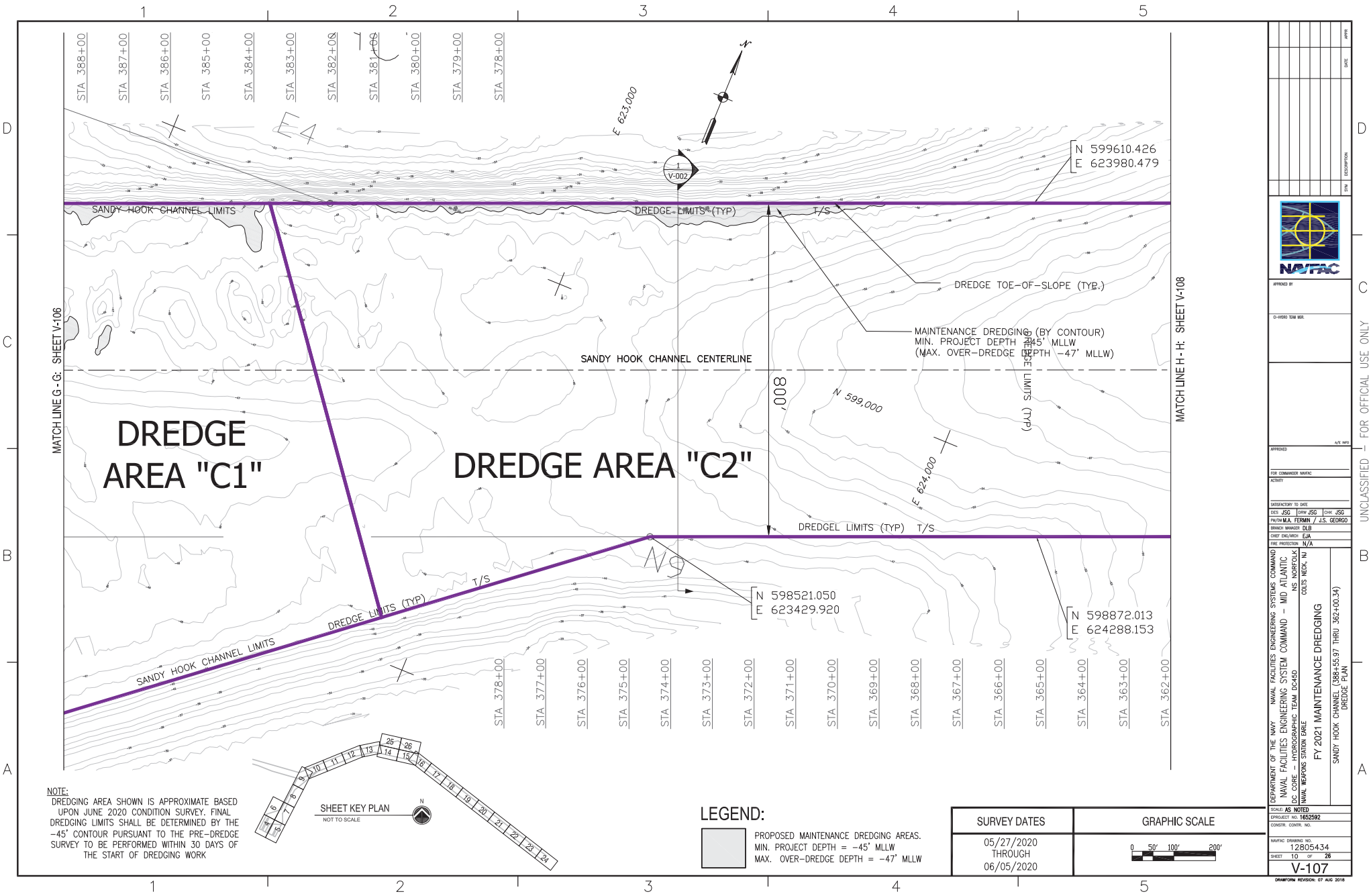
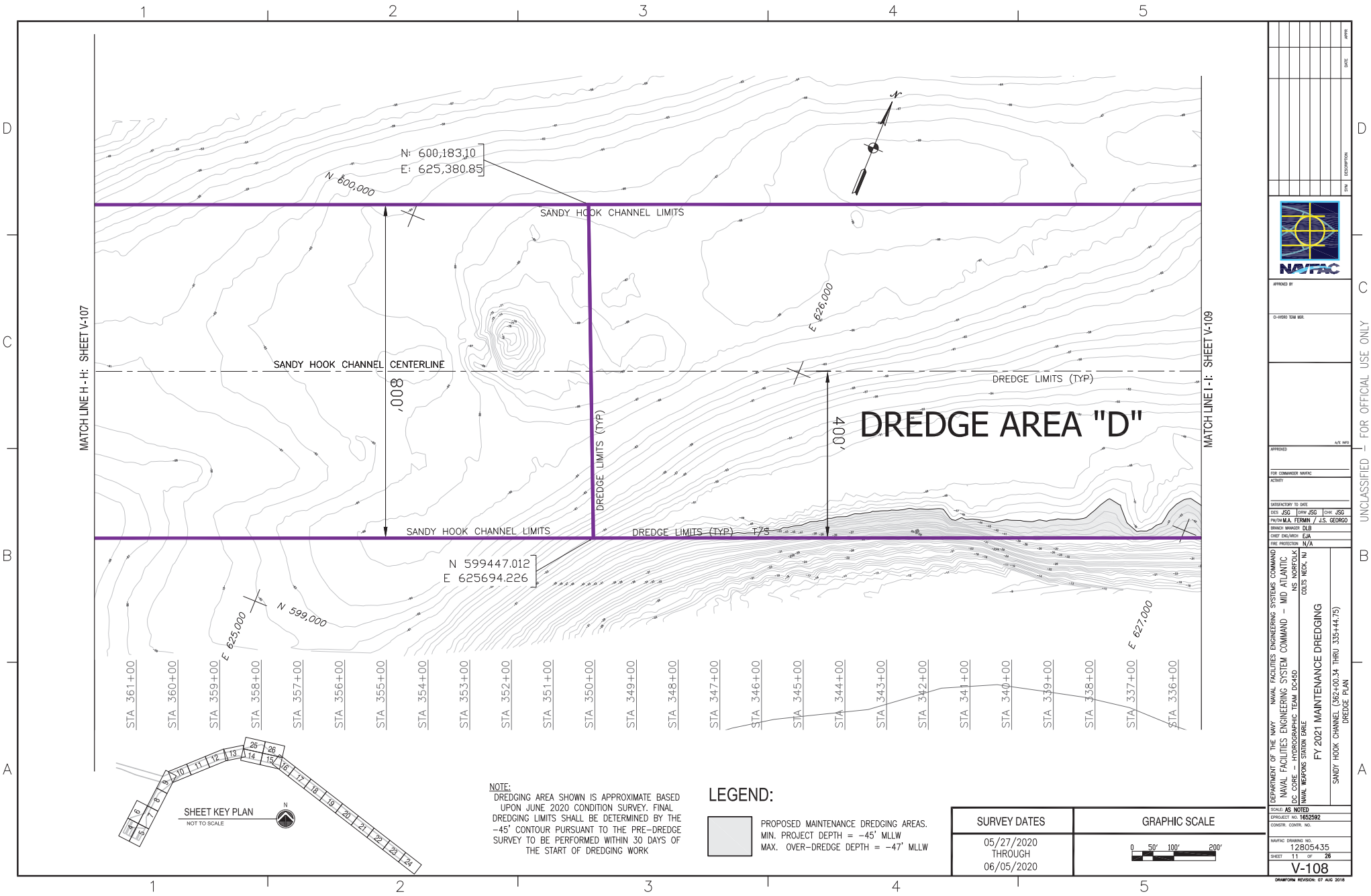


USACE FILE: NAN-2019-01440-EBR



NOTE:
DREDGING AREA SHOWN IS APPROXIMATE BASED UPON JUNE 2020 CONDITION SURVEY. FINAL DREDGING LIMITS SHALL BE DETERMINED BY THE -45' CONTOUR PURSUANT TO THE PRE-DREDGE SURVEY TO BE PERFORMED WITHIN 30 DAYS OF THE START OF DREDGING WORK

LEGEND:

PROPOSED MAINTENANCE DREDGING AREAS.
MIN. PROJECT DEPTH = -45' MLLW
MAX. OVER-DREDGE DEPTH = -47' MLLW

SURVEY DATES	GRAPHIC SCALE
05/27/2020 THROUGH 06/05/2020	0 50' 100' 200'

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND - MID ATLANTIC
DC CORE - HYDROGRAPHIC TEAM DC450 COLTS NECK, NJ
NAVAL WEAPONS STATION EARLE NS NORFOLK

FY 2021 MAINTENANCE DREDGING
SANDY HOOK CHANNEL (362+00.34 THRU 335+44.75)
DREDGE PLAN

SCALE: AS NOTED
EFPROJECT NO. 1652592
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12805435
SHEET 11 OF 26
V-108

DRAWFORM REVISION: 07 AUG 2018

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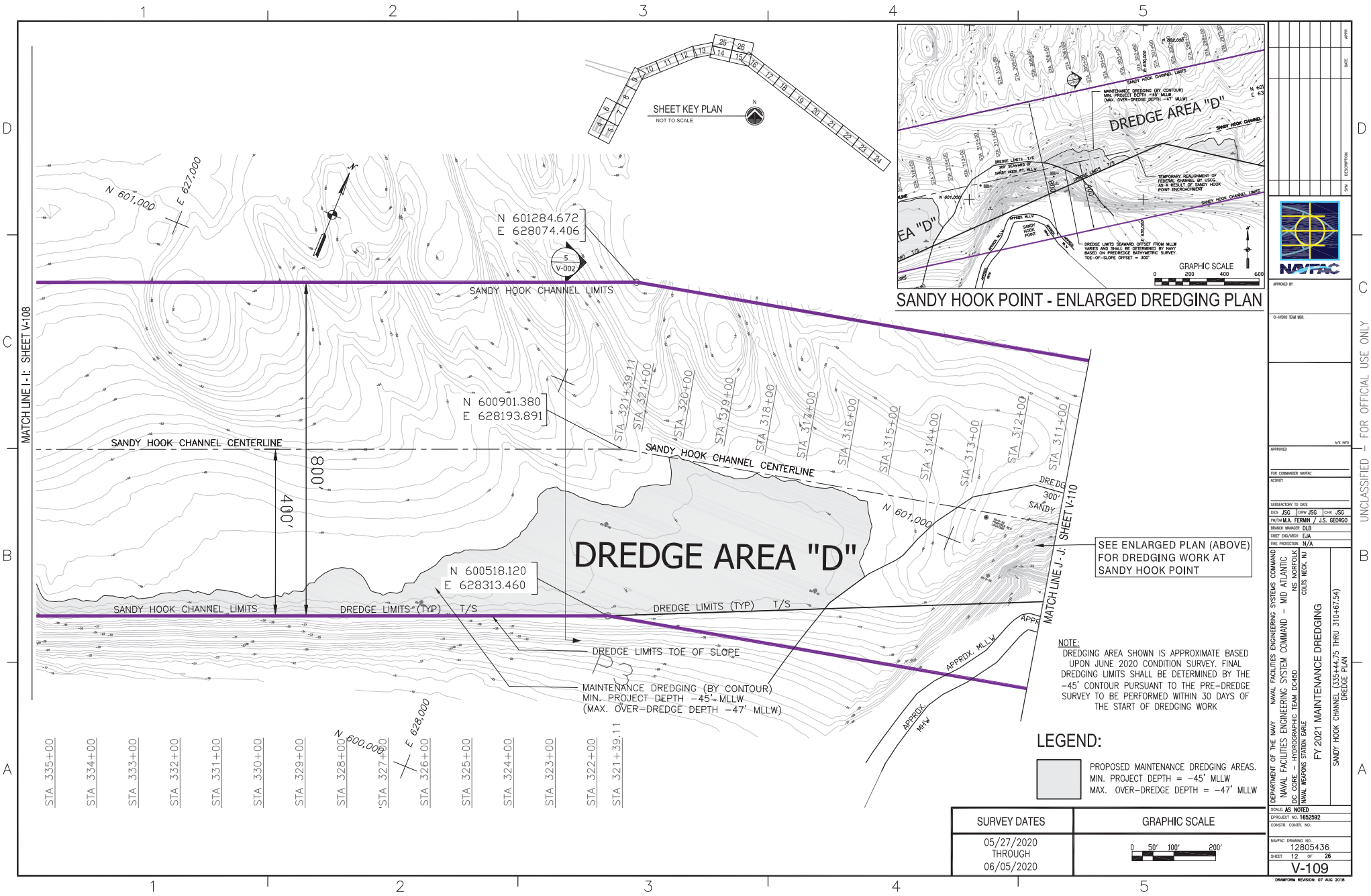
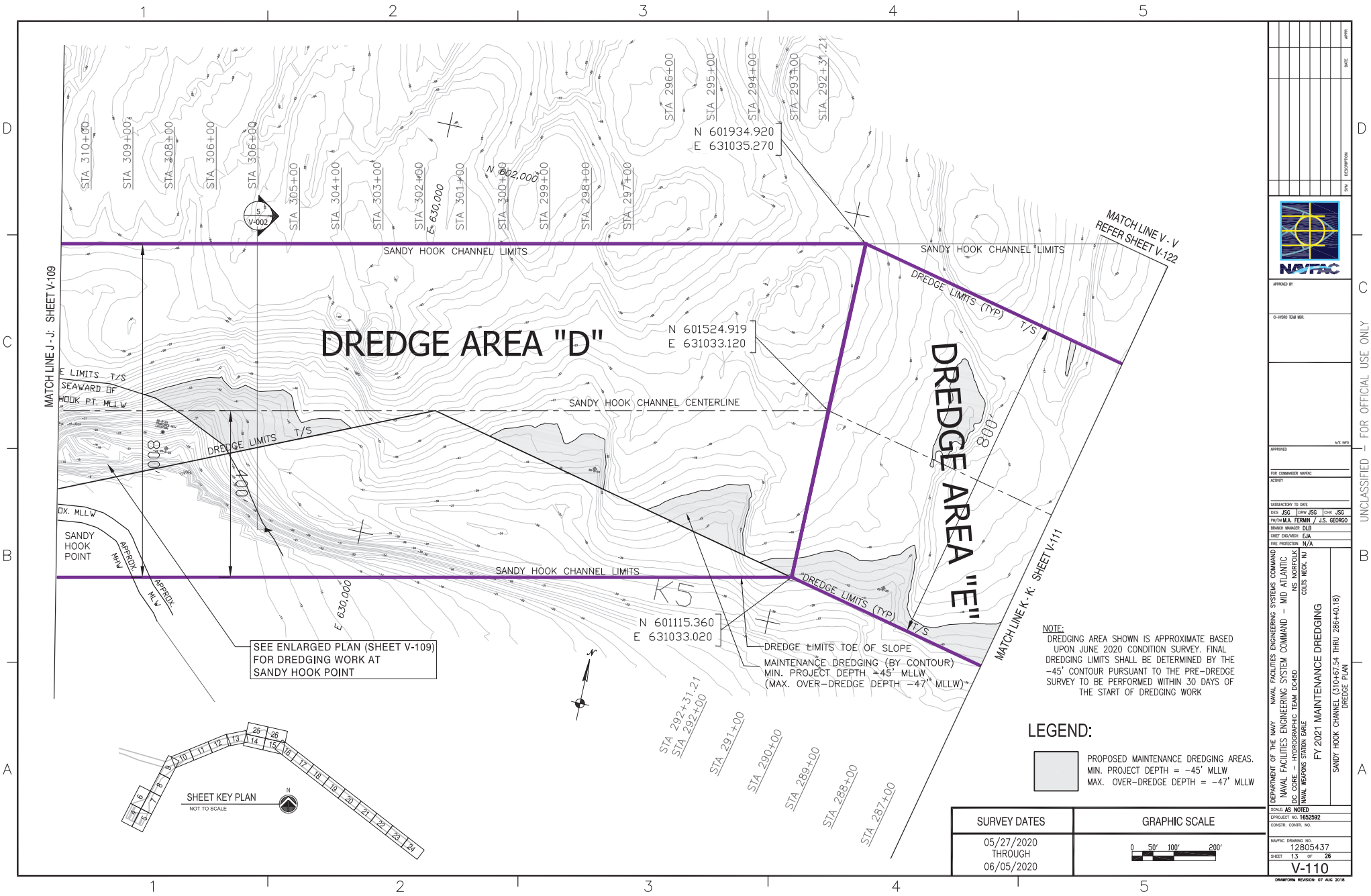
USACE FILE: NAN-2019-01440-EBR




DREDGE AREA "D"
DREDGE AREA "E"
SANDY HOOK CHANNEL LIMITS
SANDY HOOK CHANNEL CENTERLINE
DREDGE LIMITS T/S
DREDGE LIMITS (TYP)
MATCH LINE J - J: SHEET V-109
MATCH LINE K - K: SHEET V-111
MATCH LINE V - V REFER SHEET V-122
N 601934.920
E 631035.270
N 601524.919
E 631033.120
N 601115.360
E 631033.020
N 602,000
E 630,000
E 630,000
STA 310+00
STA 309+00
STA 308+00
STA 306+00
STA 306+00
STA 305+00
STA 304+00
STA 303+00
STA 302+00
STA 301+00
STA 300+00
STA 299+00
STA 298+00
STA 297+00
STA 296+00
STA 295+00
STA 294+00
STA 293+00
STA 292+31.21
STA 292+31.21
STA 292+00
STA 291+00
STA 290+00
STA 289+00
STA 288+00
STA 287+00
800'
1,000'
SANDY HOOK POINT
APPROX. MHW
APPROX. MLW
SEE ENLARGED PLAN (SHEET V-109) FOR DREDGING WORK AT SANDY HOOK POINT
DREDGE LIMITS TOE OF SLOPE
MAINTENANCE DREDGING (BY CONTOUR)
MIN. PROJECT DEPTH -45' MLLW
(MAX. OVER-DREDGE DEPTH -47' MLLW)
SHEET KEY PLAN
NOT TO SCALE
NOTE:
DREDGING AREA SHOWN IS APPROXIMATE BASED UPON JUNE 2020 CONDITION SURVEY. FINAL DREDGING LIMITS SHALL BE DETERMINED BY THE -45' CONTOUR PURSUANT TO THE PRE-DREDGE SURVEY TO BE PERFORMED WITHIN 30 DAYS OF THE START OF DREDGING WORK
LEGEND:
PROPOSED MAINTENANCE DREDGING AREAS.
MIN. PROJECT DEPTH = -45' MLLW
MAX. OVER-DREDGE DEPTH = -47' MLLW
SURVEY DATES
05/27/2020
THROUGH
06/05/2020
GRAPHIC SCALE
0 50' 100' 200'
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND - MID ATLANTIC
DC CORE - HYDROGRAPHIC TEAM DC450 COLTS NECK, NJ
NAVAL WEAPONS STATION EARLE NS NORFOLK
FY 2021 MAINTENANCE DREDGING
SANDY HOOK CHANNEL (310+67.54 THRU 286+40.18)
DREDGE PLAN
SCALE: AS NOTED
EPROJECT NO. 1652592
NAVFAC DRAWING NO. 12805437
SHEET 13 OF 26
V-110
DRAWFORM REVISION: 07 AUG 2018
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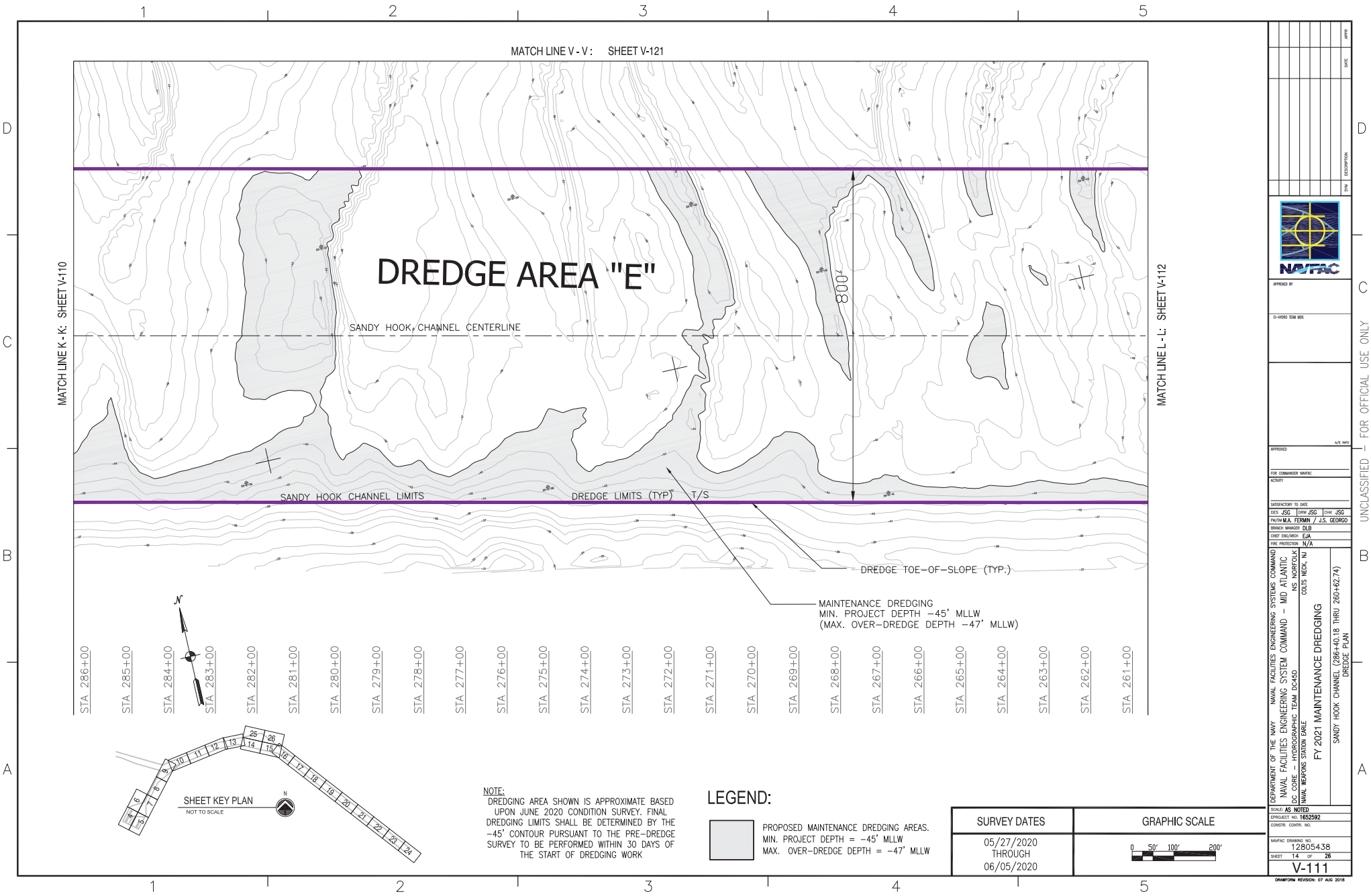
USACE FILE: NAN-2019-01440-EBR



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LEGEND:

PROPOSED MAINTENANCE DREDGING AREAS.
MIN. PROJECT DEPTH = -45' MLLW
MAX. OVER-DREDGE DEPTH = -47' MLLW

SURVEY DATES	GRAPHIC SCALE
05/27/2020 THROUGH 06/05/2020	0 50' 100' 200'

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND - MID ATLANTIC
DC CORE HYDROGRAPHIC TEAM DC450 COLTS NECK, NJ
NAVAL WEAPONS STATION EARLE NS NORFOLK

FY 2021 MAINTENANCE DREDGING
SANDY HOOK CHANNEL (286+40.18 THRU 260+62.74)
DREDGE PLAN

SCALE: AS NOTED
EPROJECT NO. 1652592
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12805438
SHEET 14 OF 26
V-111

DRAWFORM REVISION: 07 AUG 2018

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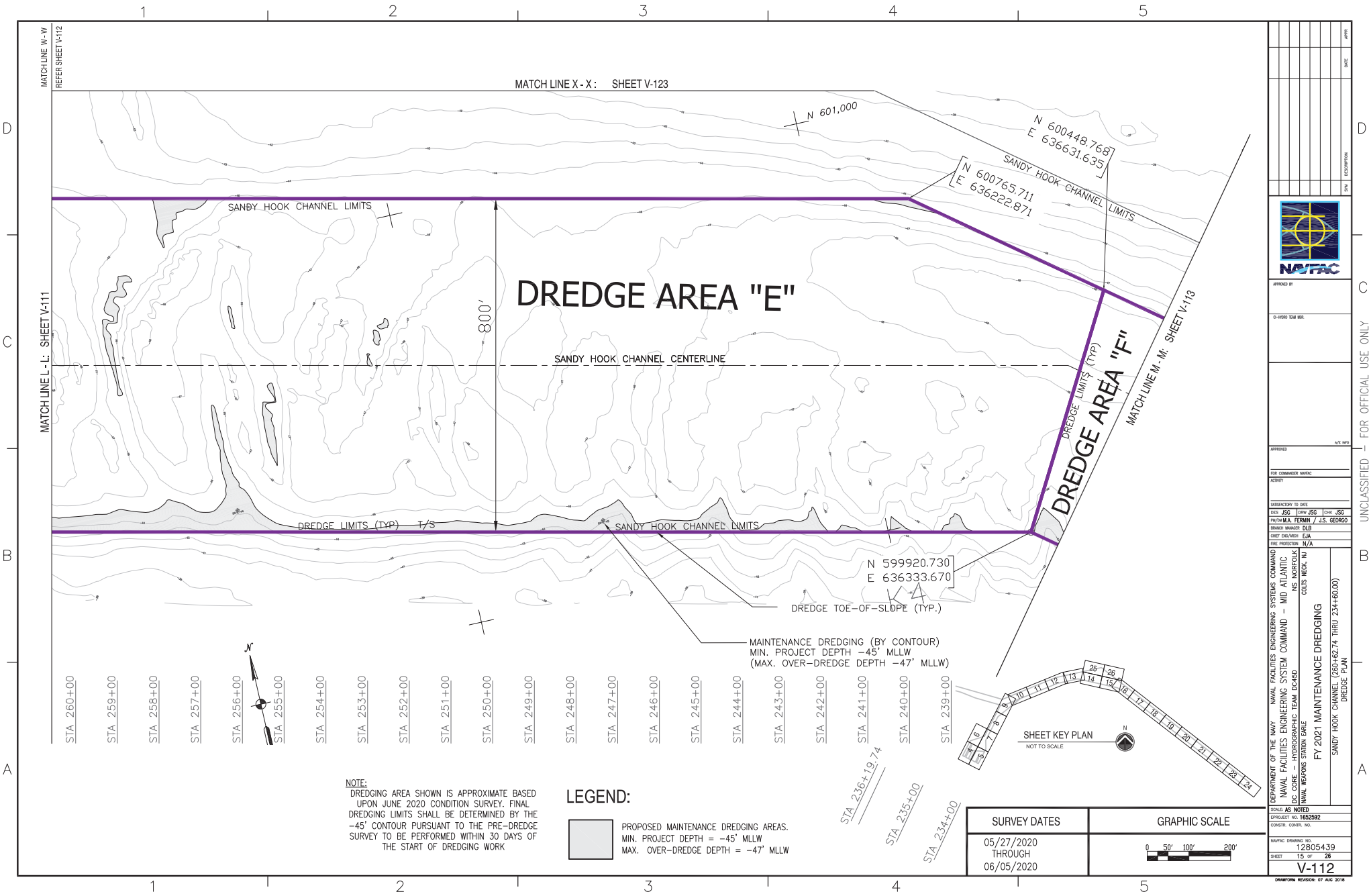
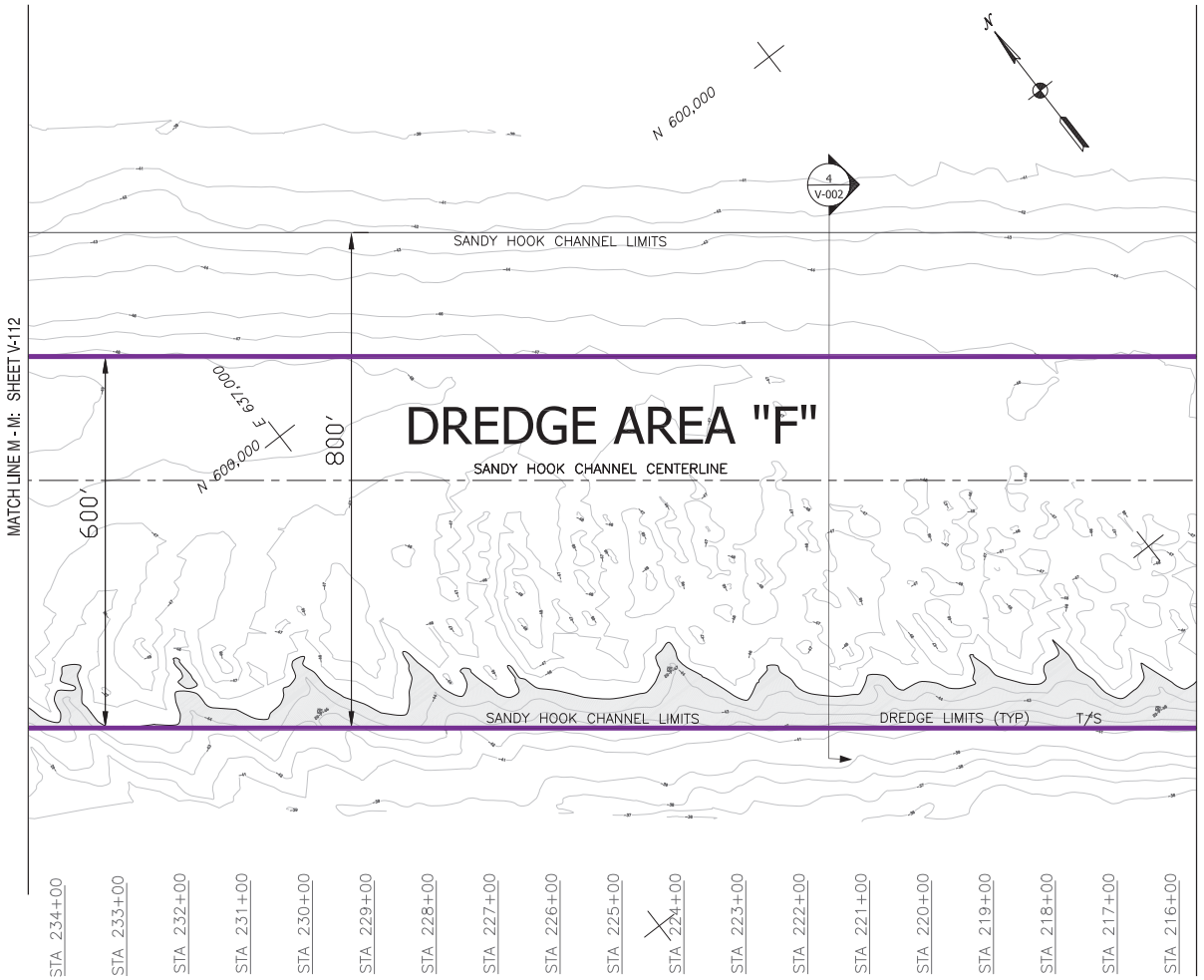
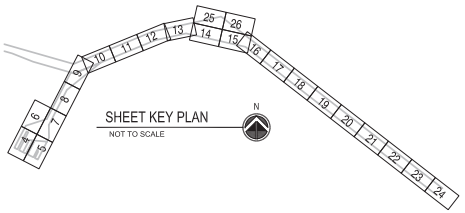


USACE FILE: NAN-2019-01440-EBR





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LEGEND:

PROPOSED MAINTENANCE DREDGING AREAS.
MIN. PROJECT DEPTH = −45' MLLW
MAX. OVER−DREDGE DEPTH = −47' MLLW

SURVEY DATES	GRAPHIC SCALE
05/27/2020 THROUGH 06/05/2020	0 50' 100' 200'

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND – MID ATLANTIC
DC CORE - HYDROGRAPHIC TEAM DC450 COLTS NECK, NJ
NAVAL WEAPONS STATION EARLE NS NORFOLK

FY 2021 MAINTENANCE DREDGING
SANDY HOOK CHANNEL (234+60.00 THRU 215+71.96)
DREDGE PLAN

SCALE: AS NOTED
EPROJECT NO. 1652592
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12805440
SHEET 16 OF 26
V-113

DRAWFORM REVISION: 07 AUG 2018

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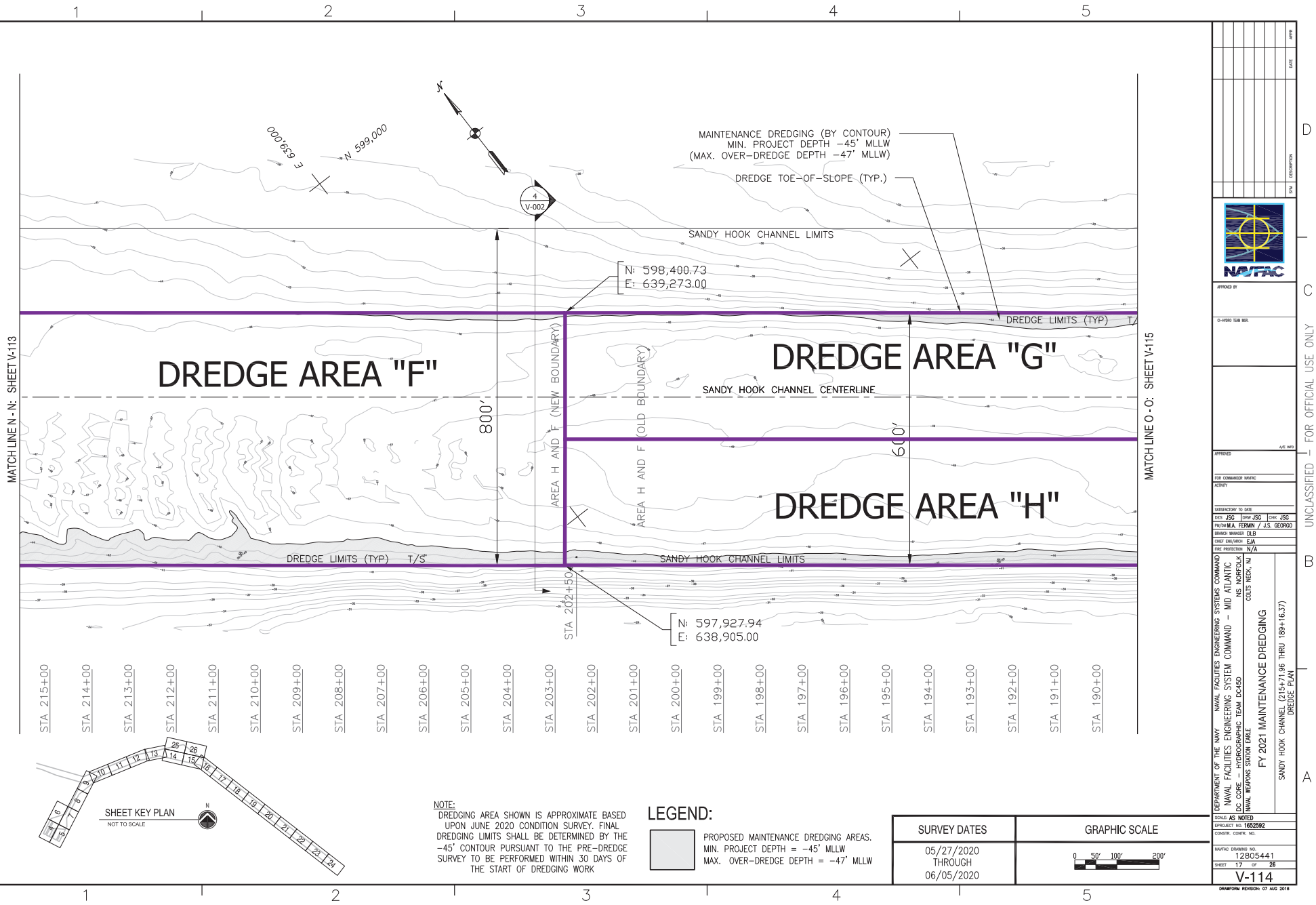

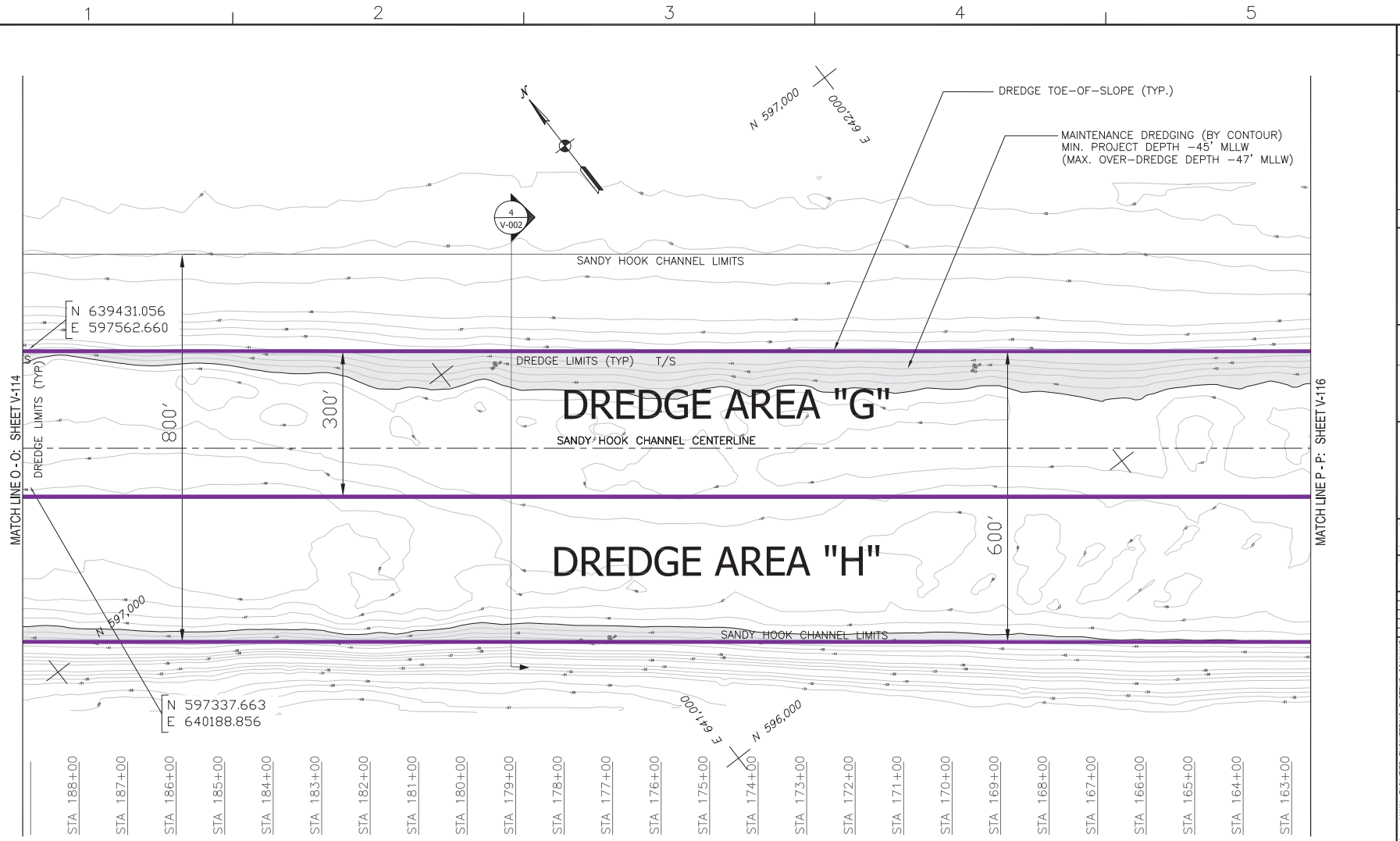

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LEGEND:

PROPOSED MAINTENANCE DREDGING AREAS.
MIN. PROJECT DEPTH = -45' MLLW
MAX. OVER-DREDGE DEPTH = -47' MLLW

SURVEY DATES	GRAPHIC SCALE
05/27/2020 THROUGH 06/05/2020	0 50' 100' 200'

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND - MID ATLANTIC
DC CORE - HYDROGRAPHIC TEAM DC450 COLTS NECK, NJ
NAVAL WEAPONS STATION EARLE NS NORFOLK

FY 2021 MAINTENANCE DREDGING
SANDY HOOK CHANNEL (189+16.37 THRU 162+60.78)
DREDGE PLAN

SCALE: AS NOTED
EPROJECT NO. 1652592
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12805442
SHEET 18 OF 26
V-115
DRAWFORM REVISION: 07 AUG 2018

DES JSG DRW JSG CHK JSG
PM/TM M.A. FERMIN / J.S. GEORGO
BRANCH MANAGER DLB
CHIEF ENG/ARCH EJA
FIRE PROTECTION N/A

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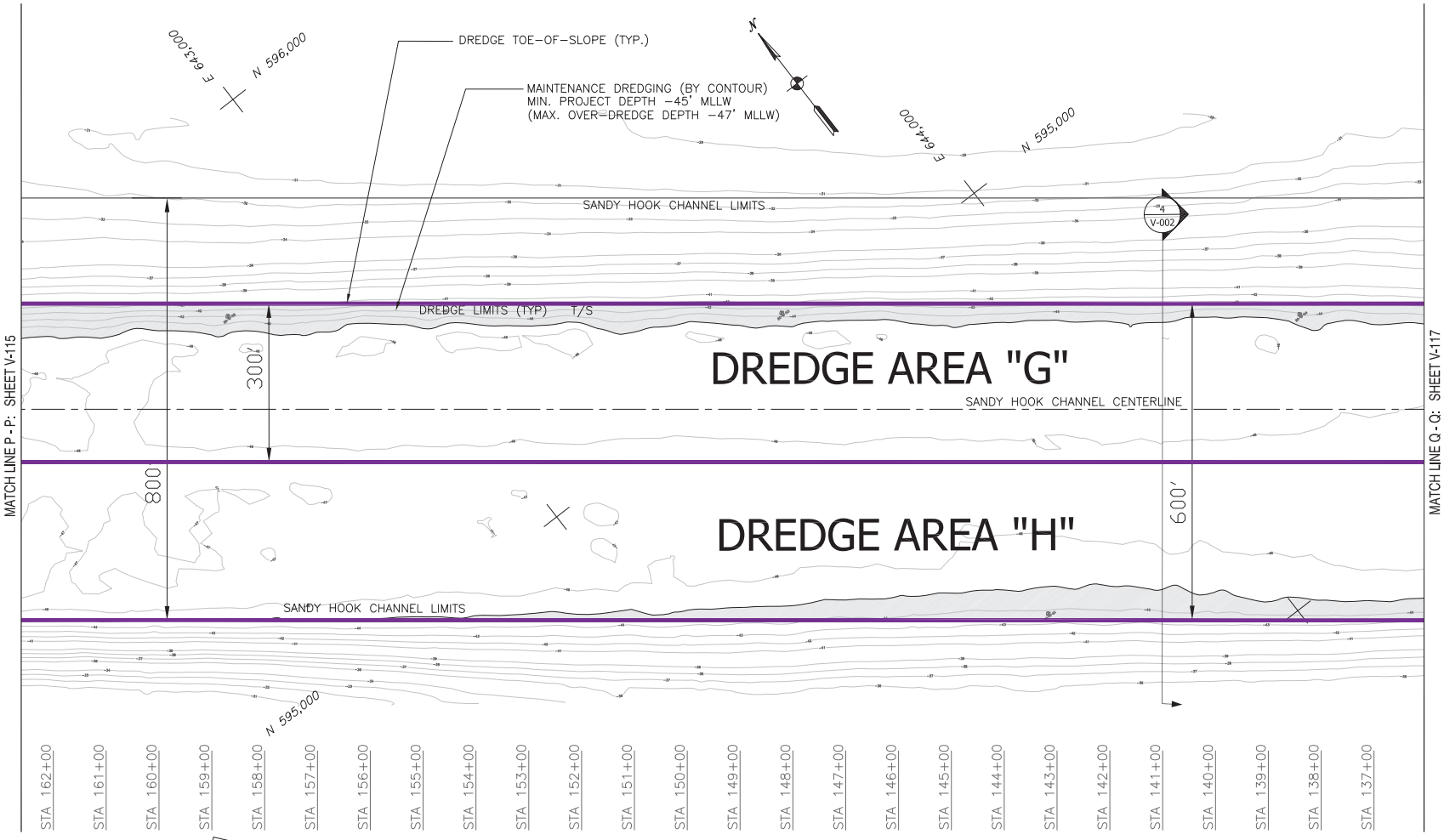
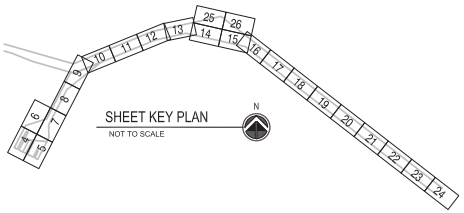
USACE FILE: NAN-2019-01440-EBR





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LEGEND:

PROPOSED MAINTENANCE DREDGING AREAS.
MIN. PROJECT DEPTH = -45' MLLW.
MAX. OVER-DREDGE DEPTH = -47' MLLW

SURVEY DATES	GRAPHIC SCALE
05/27/2020 THROUGH 06/05/2020	0 50' 100' 200'

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND - MID ATLANTIC
DC CORE - HYDROGRAPHIC TEAM DC450 COLTS NECK, NJ
NAVAL WEAPONS STATION EARLE NORFOLK, VA

FY 2021 MAINTENANCE DREDGING
SANDY HOOK CHANNEL (162+60.78 THRU 136+05.19)
DREDGE PLAN

SCALE: AS NOTED
EPROJECT NO. 1652592
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12805443
SHEET 19 OF 26
V-116

DRAWFORM REVISION: 07 AUG 2018

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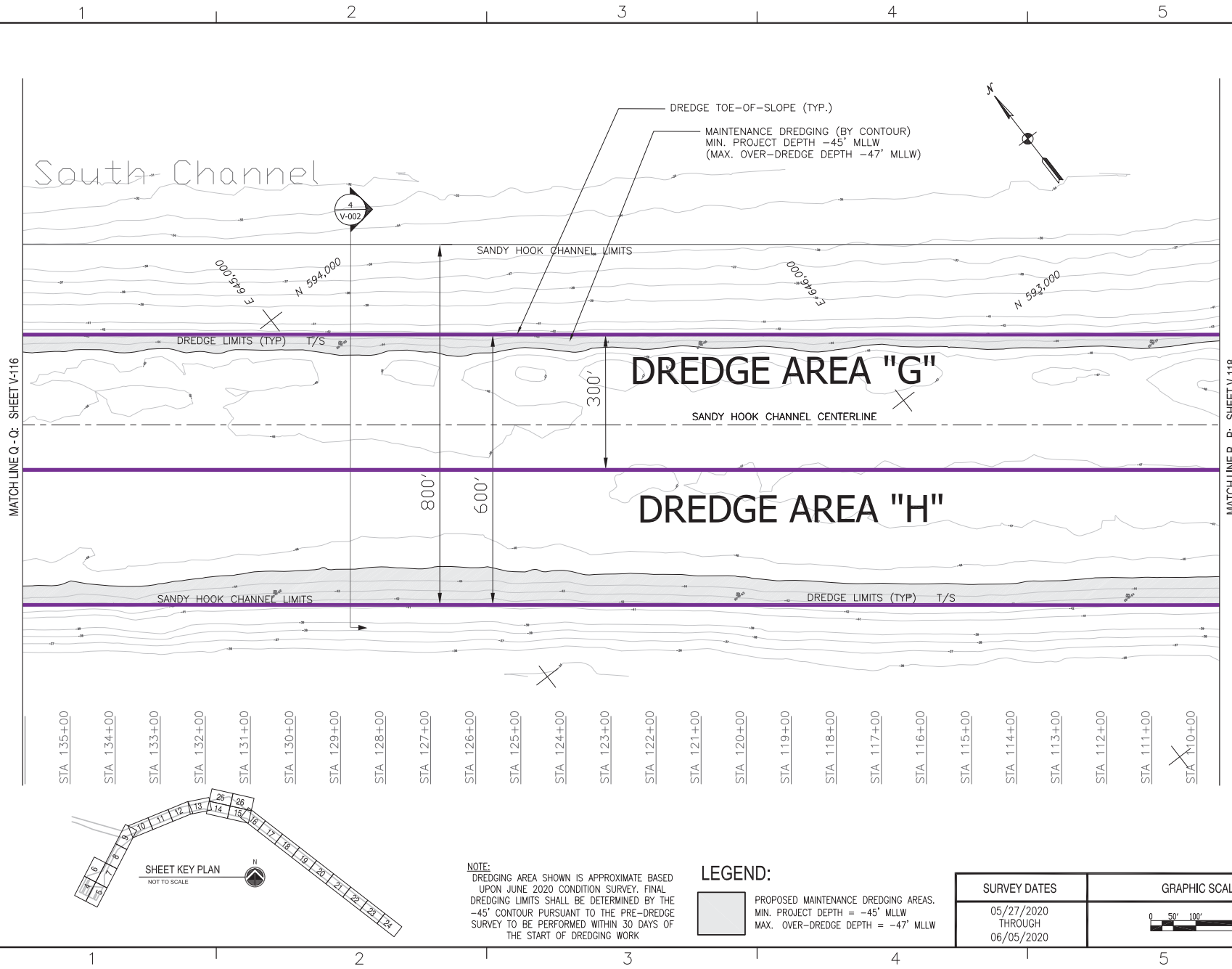

NOTE:
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LEGEND:

PROPOSED MAINTENANCE DREDGING AREAS.
MIN. PROJECT DEPTH = -45' MLLW
MAX. OVER-DREDGE DEPTH = -47' MLLW

SURVEY DATES	GRAPHIC SCALE
05/27/2020 THROUGH 06/05/2020	0 50' 100' 200'

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND - MID ATLANTIC
DC CORE - HYDROGRAPHIC TEAM DC450 COLTS NECK, NJ
NAVAL WEAPONS STATION EARLE NS NORFOLK

FY 2021 MAINTENANCE DREDGING
SANDY HOOK CHANNEL (136+05.19 THRU 109+49.60)
DREDGE PLAN

SCALE: AS NOTED
EPROJECT NO. 1652592
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12805444
SHEET 20 OF 26
V-117

DRAWFORM REVISION: 07 AUG 2018

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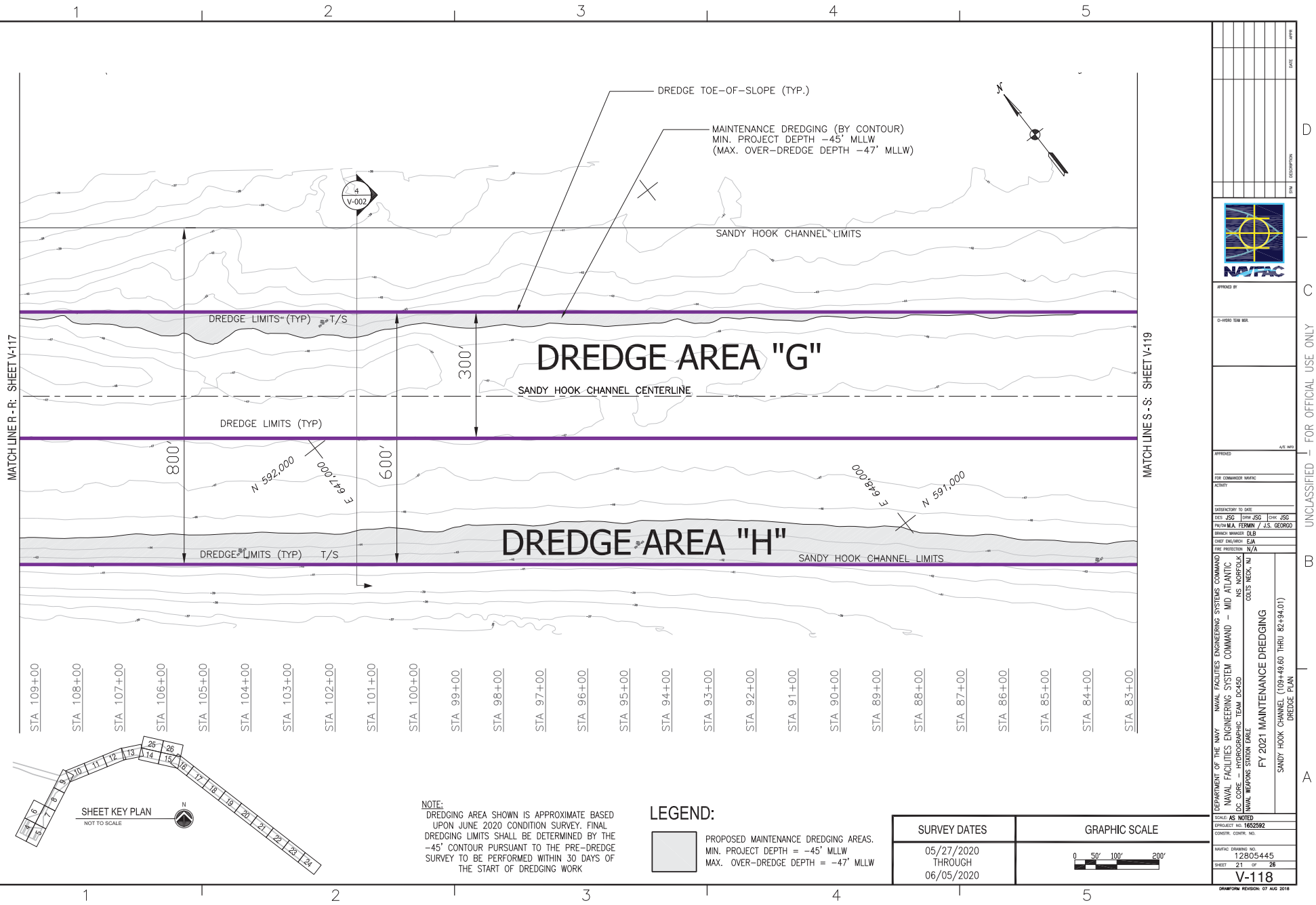
FILE NAME: C:\Users\jgoo\Documents\VGSDC_Current_Projects\NMS Earle FY21 Maintenance Dredging\CAD\1652592_FY21 NMS Earle Maint_Dredging_Permit_Dwgs.dwg LAYOUT NAME: V-117 PLOTTED: Tuesday, November 24, 2020 - 2:29pm USER: jgoo



NOTE:
DREDGING AREA SHOWN IS APPROXIMATE BASED UPON JUNE 2020 CONDITION SURVEY. FINAL DREDGING LIMITS SHALL BE DETERMINED BY THE -45' CONTOUR PURSUANT TO THE PRE-DREDGE SURVEY TO BE PERFORMED WITHIN 30 DAYS OF THE START OF DREDGING WORK

LEGEND:

PROPOSED MAINTENANCE DREDGING AREAS.
MIN. PROJECT DEPTH = -45' MLLW
MAX. OVER-DREDGE DEPTH = -47' MLLW

SURVEY DATES	GRAPHIC SCALE
05/27/2020 THROUGH 06/05/2020	0 50' 100' 200'

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND - MID ATLANTIC
DC CORE - HYDROGRAPHIC TEAM DC450 COLTS NECK, NJ
NAVAL WEAPONS STATION EARLE NS NORFOLK

FY 2021 MAINTENANCE DREDGING
SANDY HOOK CHANNEL (109+49.60 THRU 82+94.01)
DREDGE PLAN

SCALE: AS NOTED
EPROJECT NO. 1652592
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12805445
SHEET 21 OF 26
V-118

DRAWFORM REVISION: 07 AUG 2018

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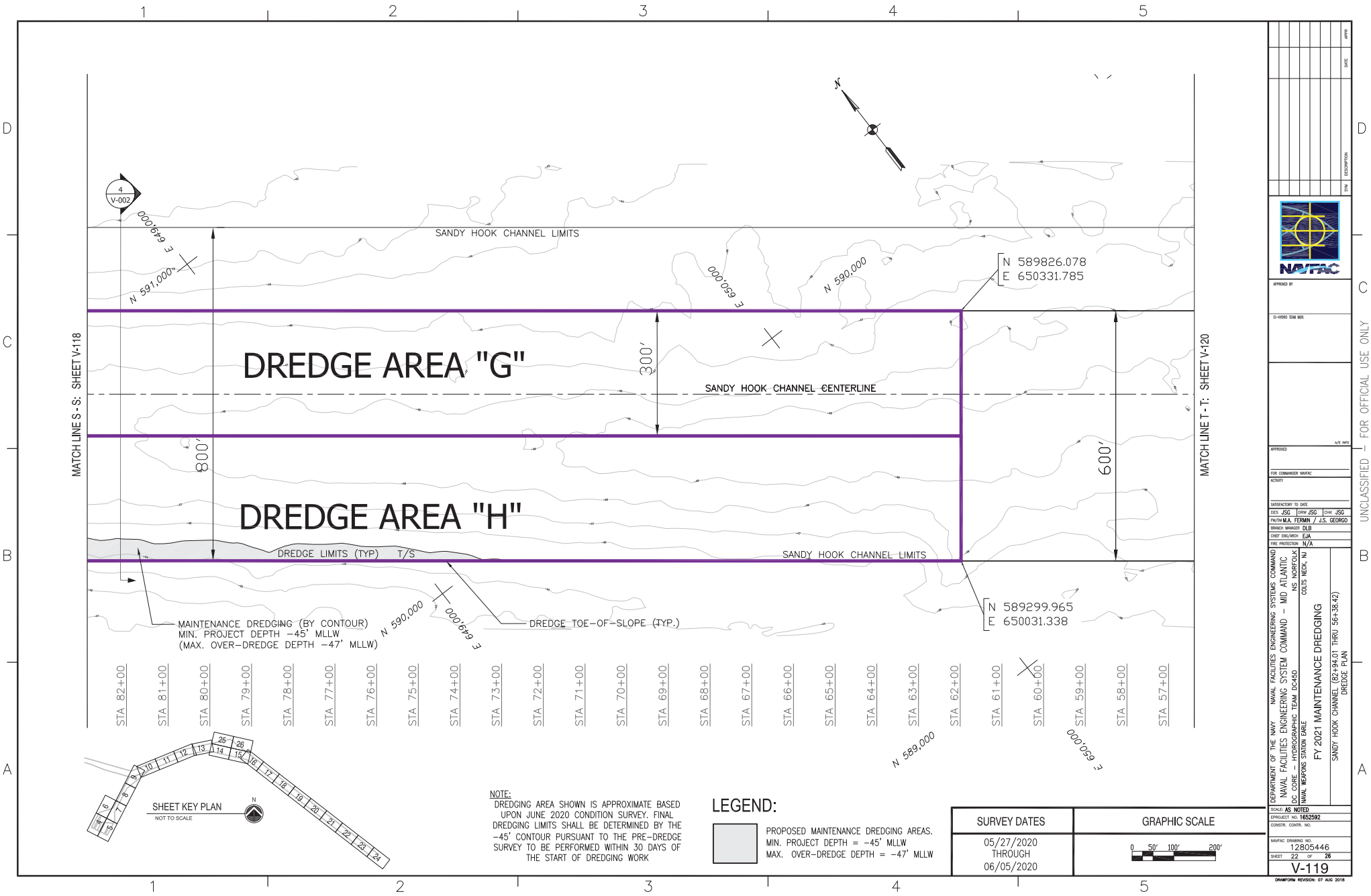
USACE FILE: NAN-2019-01440-EBR



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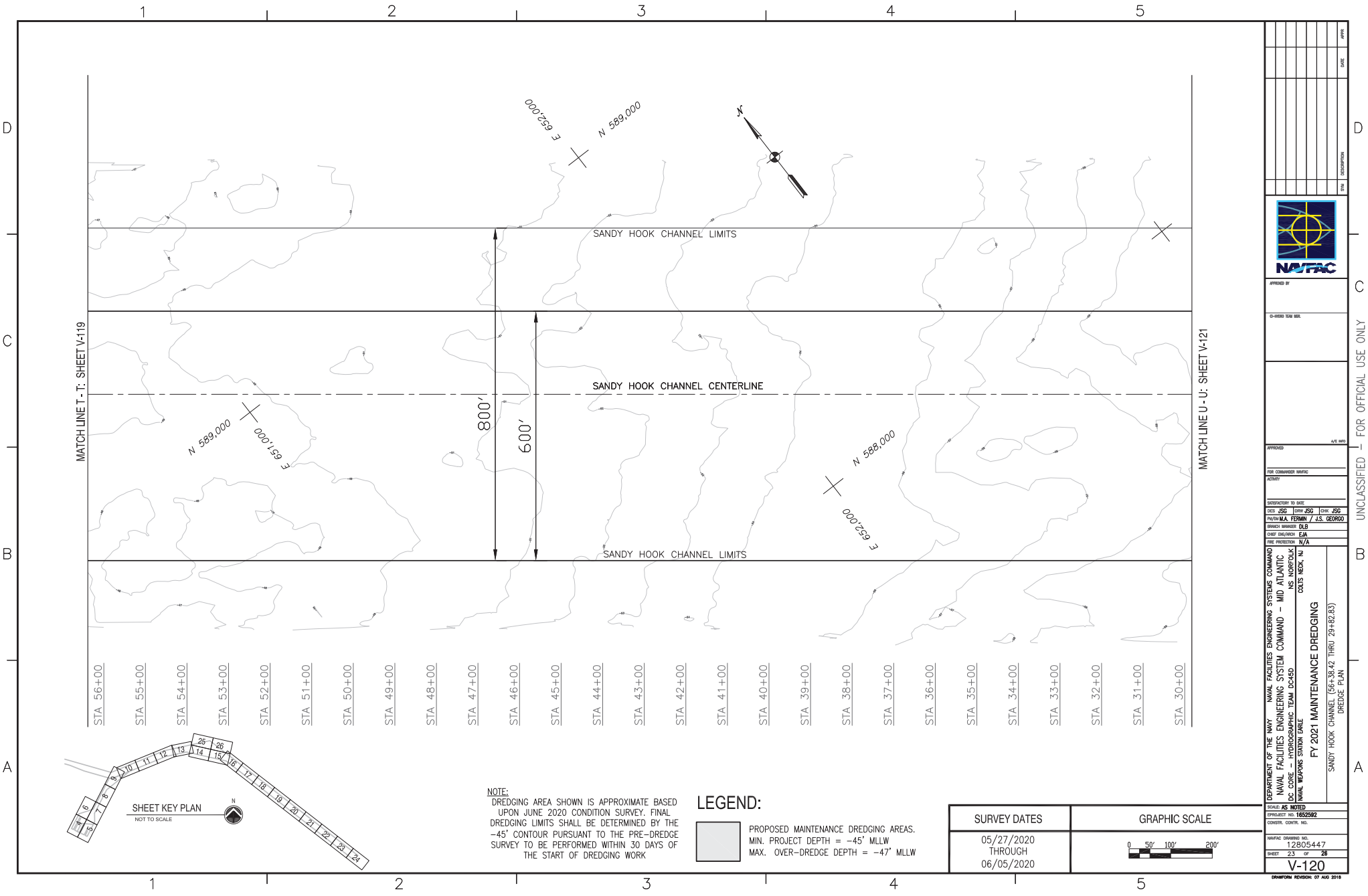

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LEGEND:

PROPOSED MAINTENANCE DREDGING AREAS.
MIN. PROJECT DEPTH = -45' MLLW
MAX. OVER-DREDGE DEPTH = -47' MLLW

SURVEY DATES	GRAPHIC SCALE
05/27/2020 THROUGH 06/05/2020	0 50' 100' 200'

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND - MID ATLANTIC
DC CORE - HYDROGRAPHIC TEAM DC45D NS NORFOLK
NAVAL WEAPONS STATION EARLE COLTS NECK, NJ

FY 2021 MAINTENANCE DREDGING
SANDY HOOK CHANNEL (56+38.42 THRU 29+82.83)
DREDGE PLAN

SCALE: AS NOTED
EPROJECT NO. 1652592
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12805447
SHEET 23 OF 26
V-120
DRAWFORM REVISION: 07 AUG 2018

APPROVED BY
O-WORD TEAM MBR.
A/E INFO
APPROVED
FOR COMMANDER NAVFAC
ACTIVITY
SATISFACTORY TO DATE
DES JSG DRW JSG CHK JSG
PM/TM M.A. FERMIN / J.S. GEORGO
BRANCH MANAGER DLB
CHIEF ENG/ARCH EJA
FIRE PROTECTION N/A

APPR. | DATE | DESCRIPTION | NO.

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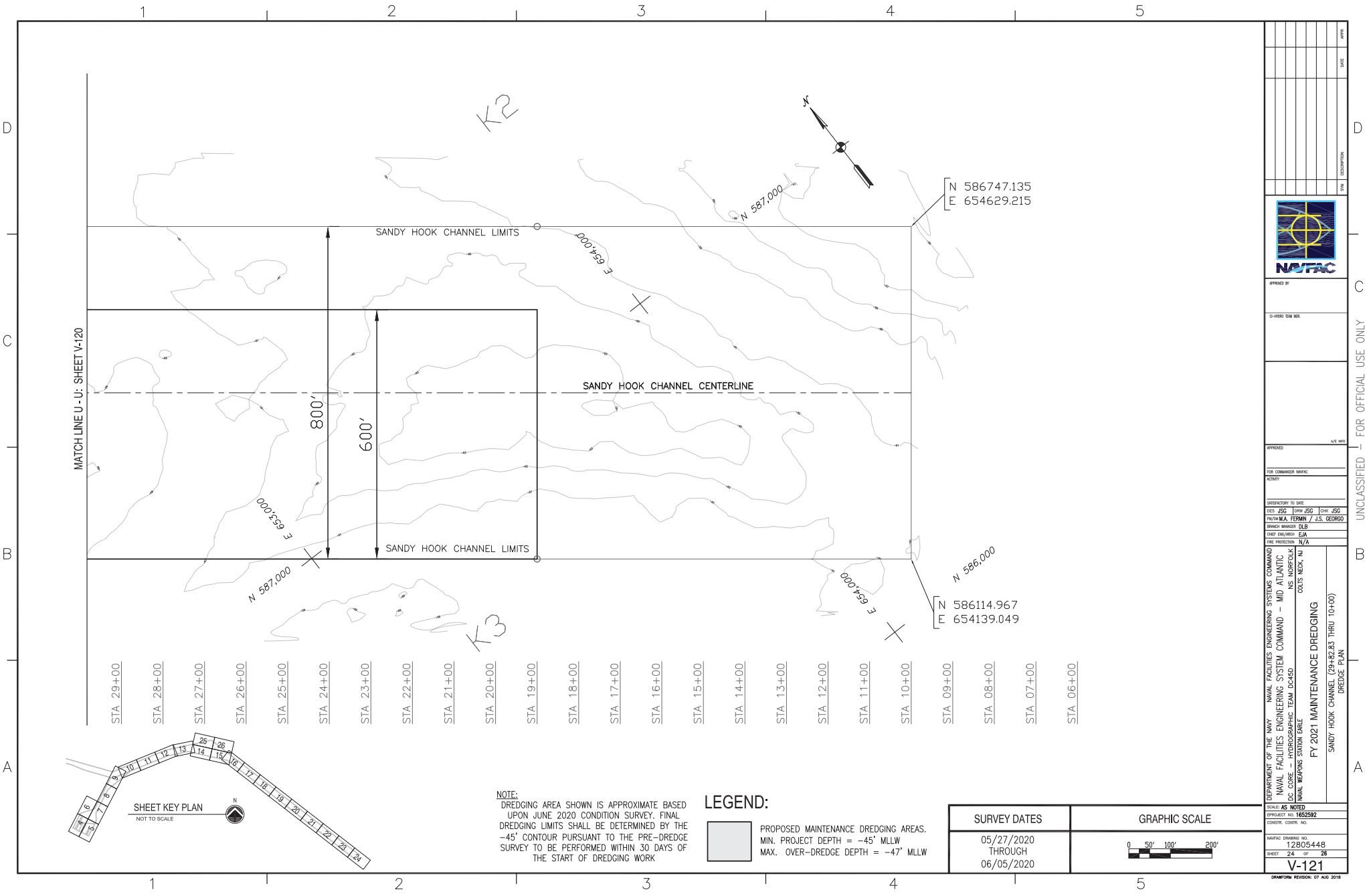
FILE NAME: C:\Users\jgoyo\Documents\ArcGIS\C_Current_Projects\NWS Earle FY21 Maintenance Dredging\CAD\1652592_FY21 NWS Earle Maint_Dredging_Permit_Drwgs.dwg LAYOUT NAME: V-120 PLOTTED: Tuesday, November 24, 2020 - 2:34pm USER: jgoyo

USACE FILE: NAN-2019-01440-EBR



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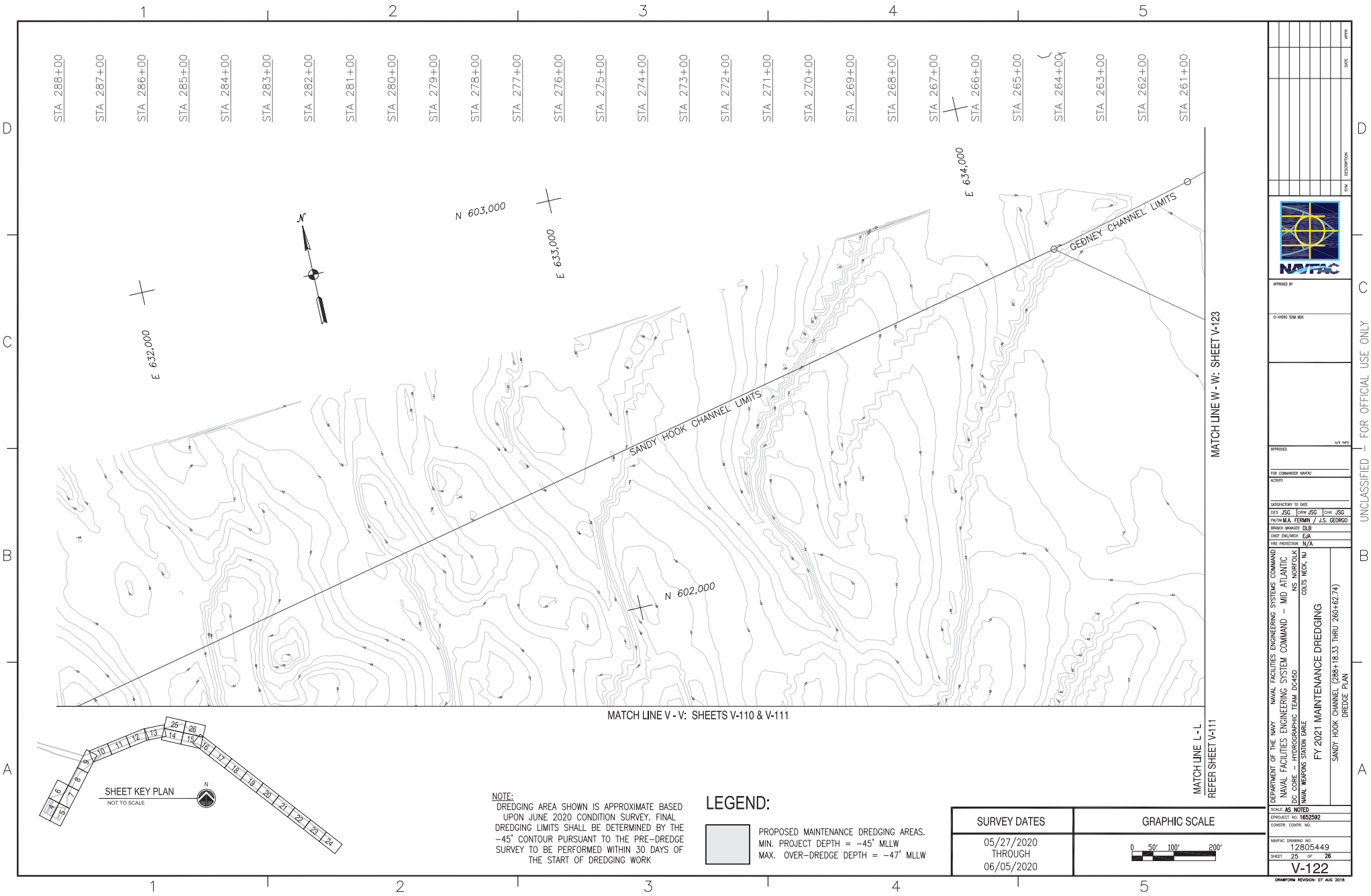

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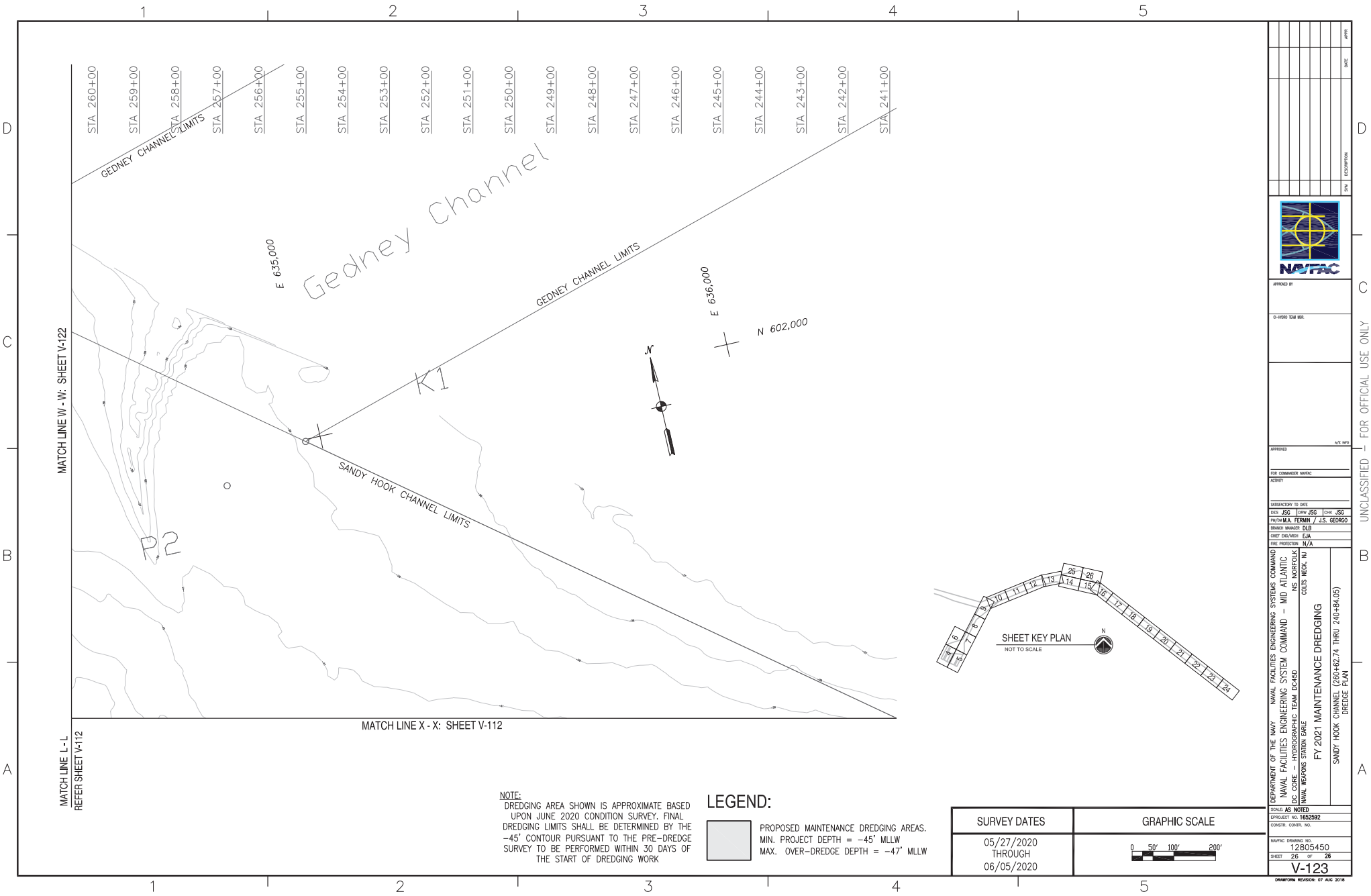

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LEGEND:

PROPOSED MAINTENANCE DREDGING AREAS.
MIN. PROJECT DEPTH = −45' MLLW
MAX. OVER−DREDGE DEPTH = −47' MLLW

SURVEY DATES	GRAPHIC SCALE
05/27/2020 THROUGH 06/05/2020	0 50' 100' 200'

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND
NAVAL FACILITIES ENGINEERING SYSTEM COMMAND − MID ATLANTIC
DC CORE - HYDROGRAPHIC TEAM DC450 COLTS NECK, NJ
NAVAL WEAPONS STATION EARLE NS NORFOLK

FY 2021 MAINTENANCE DREDGING
SANDY HOOK CHANNEL (260+62.74 THRU 240+84.05)
DREDGE PLAN

SCALE: AS NOTED
EPROJECT NO. 1652592
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12805450
SHEET 26 OF 26
V-123

DRAWFORM REVISION: 07 AUG 2018

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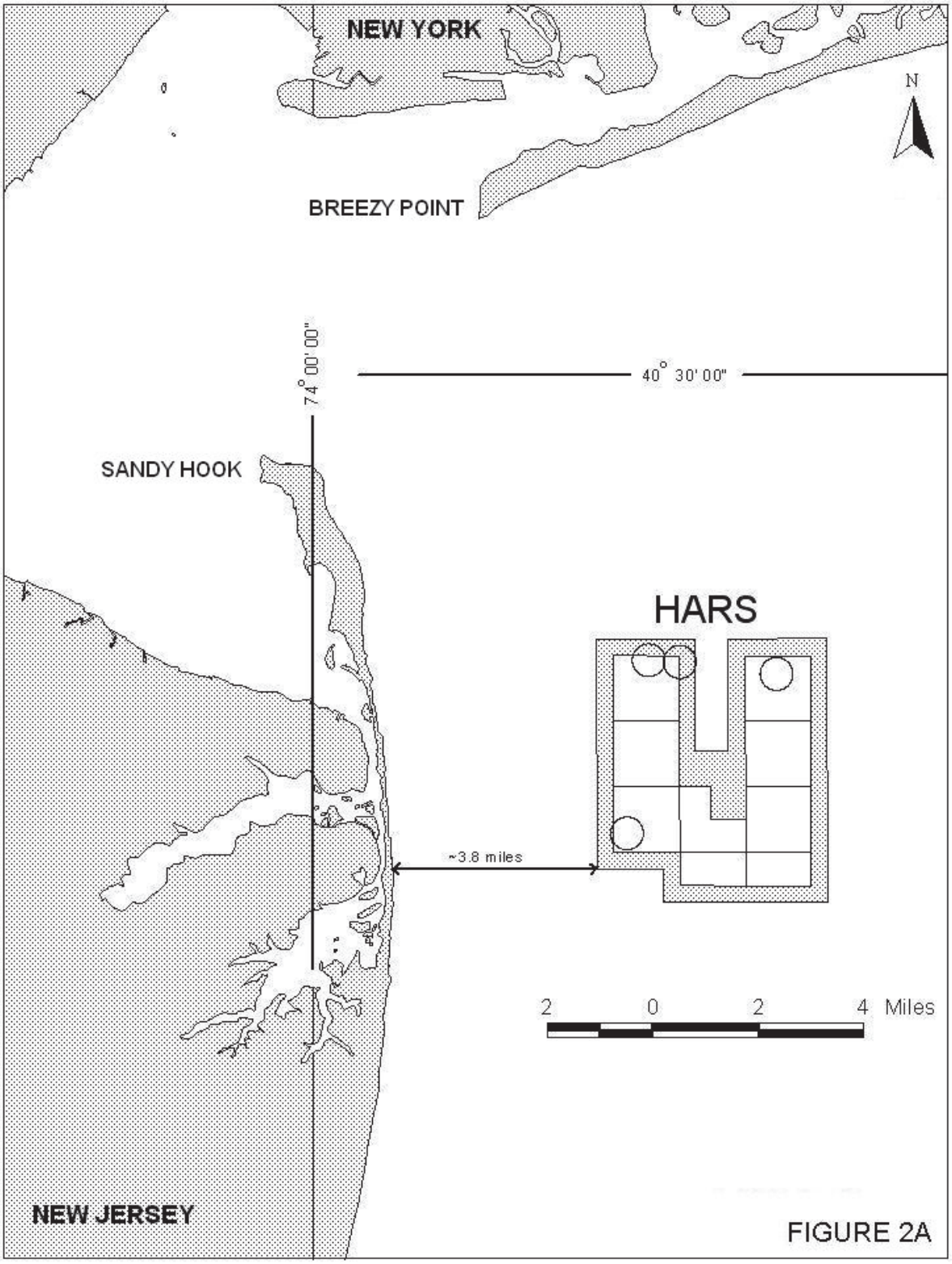
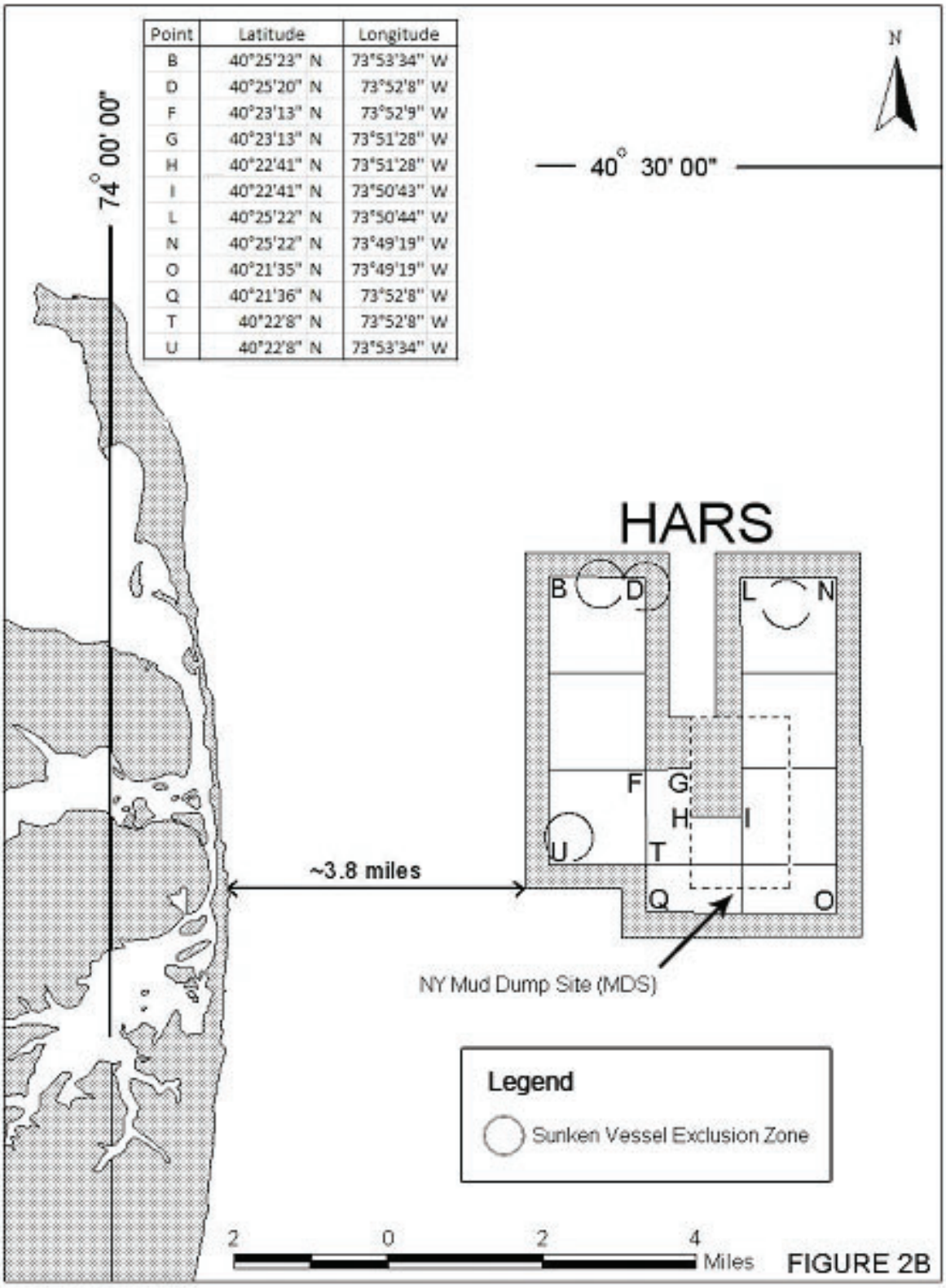


HARS Location Map 1



HARS Location Map

TABLE 1a. RESULTS OF CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE
NWS Earle Area B1

	SITE WATER		ELUTRIATE	
CONSTITUENTS	**DETECTION LIMITS**	**CONCENTRATION**	**DETECTION LIMITS**	**CONCENTRATION**
Metals	**ppb (ug/L)**	**ppb (ug/L)**	**ppb (ug/L)**	**ppb (ug/L)**
Ag	0.200	ND	0.200	ND
Cd	0.200	ND	0.200	ND
Cr	0.800	ND		1.60
Cu		1.4		1.80
Hg	0.050	ND	0.700	ND
Ni		0.90		1.40
Pb		0.400		1.80
Zn		2.30		4.20
Pesticides	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
Aldrin	0.531	ND	0.521	ND
a-Chlordane	0.442	ND	0.433	ND
trans Nonachlor	0.436	ND	0.428	ND
Dieldrin	0.544	ND	0.533	ND
4,4'-DDT	0.633	ND	0.621	ND
2,4'-DDT	0.795	ND	0.779	ND
4,4'-DDD	0.531	ND	0.521	ND
2,4'-DDD	0.582	ND	0.571	ND
4,4'-DDE	0.445	ND	0.436	ND
2,4'-DDE	0.557	ND	0.546	ND
Total DDT		**ND**		**ND**
Endosulfan I	0.531	ND	0.521	ND
Endosulfan II	0.525	ND	0.515	ND
Endosulfan sulfate	0.439	ND	0.430	ND
Heptachlor	0.534	ND	0.524	ND
Heptachlor epoxide	0.422	ND	0.433	ND
Industrial Chemicals	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
PCB 8	0.572	ND	0.561	ND
PCB 18	0.366	ND	0.359	ND
PCB 28	0.423	ND	0.415	ND
PCB 44	0.534	ND	0.524	ND
PCB 49	0.391	ND	0.383	ND
PCB 52	0.499	ND	0.489	ND
PCB 66	0.601	ND	0.589	ND
PCB 87	0.461	ND	0.452	ND
PCB 101	0.388	ND	0.380	ND
PCB 105	0.598	ND	0.586	ND
PCB 118	0.576	ND	0.565	ND
PCB 128	0.417	ND	0.409	ND
PCB 138	0.493	ND	0.483	ND
PCB 153	0.493	ND	0.483	ND
PCB 170	0.452	ND	0.443	ND
PCB 180	0.458	ND	0.449	ND
PCB 183	0.410	ND	0.402	ND
PCB 184	0.576	ND	0.565	ND
PCB 187	0.423	ND	0.415	ND
PCB 195	0.429	ND	0.421	ND
PCB 206	0.464	ND	0.455	ND
PCB 209	0.445	ND	0.436	ND
Total PCB		**ND**		**ND**

ND = Not detected
For values reported as ND, one-half of the detection limit is used in the calculation of Total DDT and Total PCB

Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
(If all DDT metabolites are ND, the total is reported as ND)

Total PCB = sum of congeners reported x 2
(If all PCB congeners are ND, the total is reported as ND)

ppb = parts per billion
ug/L = micrograms per liter
pptr = parts per trillion
ng/L = nanograms per liter

TABLE 1b. RESULTS OF CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE
NWS Earle Area B2

	SITE WATER		ELUTRIATE	
CONSTITUENTS	**DETECTION LIMITS**	**CONCENTRATION**	**DETECTION LIMITS**	**CONCENTRATION**
Metals	**ppb (ug/L)**	**ppb (ug/L)**	**ppb (ug/L)**	**ppb (ug/L)**
Ag	0.200	ND	0.200	ND
Cd	0.200	ND	0.2	ND
Cr	0.800	ND		3.40
CND		1.90		2.90
Hg	0.050	ND	0.050	ND
Ni	0.800	ND		2.30
Pb		0.600		4.00
Zn		2.50		7.30
Pesticides	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
Aldrin	0.531	ND	0.521	ND
a-Chlordane	0.442	ND	0.433	ND
trans Nonachlor	0.436	ND	0.428	ND
Dieldrin	0.544	ND	0.533	ND
4,4'-DDT	0.633	ND	0.621	ND
2,4'-DDT	0.795	ND	0.779	ND
4,4'-DDD	0.531	ND	0.521	ND
2,4'-DDD	0.582	ND	0.571	ND
4,4'-DDE	0.445	ND	0.436	ND
2,4'-DDE	0.557	ND	0.546	ND
Total DDT		**ND**		**ND**
Endosulfan I	0.531	ND	0.521	ND
Endosulfan II	0.525	ND	0.515	ND
Endosulfan sulfate	0.439	ND	0.430	ND
Heptachlor	0.534	ND	0.524	ND
Heptachlor epoxide	0.422	ND	0.433	ND
Industrial Chemicals	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
PCB 8	0.572	ND	0.561	ND
PCB 18	0.366	ND	0.359	ND
PCB 28	0.423	ND	0.415	ND
PCB 44	0.534	ND	0.524	ND
PCB 49	0.391	ND	0.383	ND
PCB 52	0.499	ND	0.489	ND
PCB 66	0.601	ND	0.589	ND
PCB 87	0.461	ND	0.452	ND
PCB 101	0.388	ND	0.380	ND
PCB 105	0.598	ND	0.586	ND
PCB 118	0.576	ND	0.565	ND
PCB 128	0.417	ND	0.409	ND
PCB 138	0.493	ND	0.483	ND
PCB 153	0.493	ND	0.483	ND
PCB 170	0.452	ND	0.443	ND
PCB 180	0.458	ND	0.449	ND
PCB 183	0.410	ND	0.402	ND
PCB 184	0.576	ND	0.565	ND
PCB 187	0.423	ND	0.415	ND
PCB 195	0.429	ND	0.421	ND
PCB 206	0.464	ND	0.455	ND
PCB 209	0.445	ND	0.436	ND
Total PCB		**ND**		**ND**

ND = Not detected
For values reported as ND, one-half of the detection limit is used in the calculation of Total DDT and Total PCB

Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
(If all DDT metabolites are ND, the total is reported as ND)

Total PCB = sum of congeners reported x 2
(If all PCB congeners are ND, the total is reported as ND)

ppb = parts per billion
ug/L = micrograms per liter
pptr = parts per trillion
ng/L = nanograms per liter

TABLE 1c. RESULTS OF CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE
NWS Earle Area C1

	SITE WATER		ELUTRIATE	
CONSTITUENTS	**DETECTION LIMITS**	**CONCENTRATION**	**DETECTION LIMITS**	**CONCENTRATION**
Metals	**ppb (ug/L)**	**ppb (ug/L)**	**ppb (ug/L)**	**ppb (ug/L)**
Ag	0.200	ND	0.200	ND
Cd	0.200	ND	0.200	ND
Cr	0.800	ND		1.80
Cu		1.70		2.00
Hg	0.050	ND	0.050	ND
Ni	0.800	ND		1.30
Pb		0.800		2.60
Zn		3.00		5.80
Pesticides	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
Aldrin	0.531	ND	0.521	ND
a-Chlordane	0.442	ND	0.433	ND
trans Nonachlor	0.436	ND	0.428	ND
Dieldrin	0.544	ND	0.533	ND
4,4'-DDT	0.633	ND	0.621	ND
2,4'-DDT	0.795	ND	0.779	ND
4,4'-DDD	0.531	ND	0.521	ND
2,4'-DDD	0.582	ND	0.571	ND
4,4'-DDE	0.445	ND	0.436	ND
2,4'-DDE	0.557	ND	0.546	ND
Total DDT		**ND**		**ND**
Endosulfan I	0.531	ND	0.521	ND
Endosulfan II	0.525	ND	0.515	ND
Endosulfan sulfate	0.439	ND	0.430	ND
Heptachlor	0.534	ND	0.524	ND
Heptachlor epoxide	0.422	ND	0.433	ND
Industrial Chemicals	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
PCB 8	0.572	ND	0.561	ND
PCB 18	0.366	ND	0.359	ND
PCB 28	0.423	ND	0.415	ND
PCB 44	0.534	ND	0.524	ND
PCB 49	0.391	ND	0.383	ND
PCB 52	0.499	ND	0.489	ND
PCB 66	0.601	ND	0.589	ND
PCB 87	0.461	ND	0.452	ND
PCB 101	0.388	ND	0.380	ND
PCB 105	0.598	ND	0.586	ND
PCB 118	0.576	ND	0.565	ND
PCB 128	0.417	ND	0.409	ND
PCB 138	0.493	ND	0.483	ND
PCB 153	0.493	ND	0.483	ND
PCB 170	0.452	ND	0.443	ND
PCB 180	0.458	ND	0.449	ND
PCB 183	0.410	ND	0.402	ND
PCB 184	0.576	ND	0.565	ND
PCB 187	0.423	ND	0.415	ND
PCB 195	0.429	ND	0.421	ND
PCB 206	0.464	ND	0.455	ND
PCB 209	0.445	ND	0.436	ND
Total PCB		**ND**		**ND**

ND = Not detected
For values reported as ND, one-half of the detection limit is used in the calculation of Total DDT and Total PCB

Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
(If all DDT metabolites are ND, the total is reported as ND)

Total PCB = sum of congeners reported x 2
(If all PCB congeners are ND, the total is reported as ND)

ppb = parts per billion
ug/L = micrograms per liter
pptr = parts per trillion
ng/L = nanograms per liter

NWS EARLE AREA B1

TABLE 2a. TOXICITY TEST RESULTS

Suspended Particulate Phase

Test Species	Test Duration	LC_{50}/EC_{50}	LPC (a)
Menidia beryllina	96 hours	**(b)** >100 %	1.000
Americamysis bahia	96 hours	**(b)** >100 %	1.000
Mytilus edulis **(larval survival)**	48 hours	**(b)** 91.8%	0.918
Mytilus edulis **(larval normal develop.)**	48 hours	**(c)** 31.8%	0.318

(a) Limiting Permissible Concentration (LPC) is the LC_{50} or EC_{50} multiplied by 0.01

(b) Median Lethal Concentration (LC_{50}) resulting in 50% mortatlity at test termination

(c) Median Effective Concentration (EC_{50}) based on normal development to the D-cell, prodissoconch 1 stage

Whole Sediment (10 days)

Test Species	% Survival Reference	% Survival Test	% Difference Reference - Test	Is difference statistically significant? (a=0.05)
Ampelisca abdita	97%	97%	0%	No
Americamysis bahia	98%	94%	4%	No

NWS EARLE AREA B2

TABLE 2b. TOXICITY TEST RESULTS

Suspended Particulate Phase

Test Species	Test Duration	LC_{50}/EC_{50}	LPC (a)
Menidia beryllina	96 hours	**(b)** >100%	1.000
Americamysis bahia	96 hours	**(b)** >100%	1.000
Mytilus edulis **(larval survival)**	48 hours	**(b)** >100%	1.000
Mytilus edulis **(larval normal develop.)**	48 hours	**(c)** 30.4%	0.304

(a) Limiting Permissible Concentration (LPC) is the LC_{50} or EC_{50} multiplied by 0.01

(b) Median Lethal Concentration (LC_{50}) resulting in 50% mortatlity at test termination

(c) Median Effective Concentration (EC_{50}) based on normal development to the D-cell, prodissoconch 1 stage

Whole Sediment (10 days)

Test Species	% Survival Reference	% Survival Test	% Difference Reference - Test	Is difference statistically significant? (a=0.05)
Ampelisca abdita	97%	96%	1%	No
Americamysis bahia	98%	95%	3%	No

NWS EARLE AREA C1

TABLE 2c. TOXICITY TEST RESULTS

Suspended Particulate Phase

Test Species	Test Duration	LC_{50}/EC_{50}	LPC (a)
Menidia beryllina	96 hours	**(b)** >100 %	1.000
Americamysis bahia	96 hours	**(b)** >100 %	1.000
Mytilus edulis **(larval survival)**	48 hours	**(b)** >100%	1.000
Mytilus edulis **(larval normal develop.)**	48 hours	**(c)** 76.9%	0.769

(a) Limiting Permissible Concentration (LPC) is the LC_{50} or EC_{50} multiplied by 0.01

(b) Median Lethal Concentration (LC_{50}) resulting in 50% mortatlity at test termination

(c) Median Effective Concentration (EC_{50}) based on normal development to the D-cell, prodissoconch 1 stage

Whole Sediment (10 days)

Test Species	% Survival Reference	% Survival Test	% Difference Reference - Test	Is difference statistically significant? (a=0.05)
Ampelisca abdita	97%	96%	1%	No
Americamysis bahia	98%	94%	4%	No

EA Job No. 6350601

TABLE 3a. 28 DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE
Wet weight concentrations
NWS Earle Area B1

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)
Ag		0.066		0.054		0.037		0.019
As		4.42		4.30		2.52		2.10
Cd		0.144		0.049		0.131		0.069
Cr		0.476		0.388		0.187		0.341
Cu		1.57		* 2.40		0.93		* 1.31
Hg		0.016		* 0.021		0.022		0.021
Ni		0.628		0.551	0.300	ND		0.294
Pb		0.118		* 0.635		0.153		* 0.443
Zn		16.0		14.2		20.4		26.2
Pesticides	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Aldrin		0.20	0.028	ND	0.028	ND	0.028	ND
a-Chlordane		0.090		* 0.199		0.077		* 0.270
trans Nonachlor		0.04		* 0.084		0.214		* 0.342
Dieldrin		0.027		* 0.161		0.118		* 0.364
4,4'-DDT	0.024	ND	0.024	ND	0.024	ND	0.024	ND
2,4'-DDT	0.034	ND	0.034	ND	0.034	ND	0.062	ND
4,4'-DDD		0.171		* 0.615		0.212		* 0.690
2,4'-DDD	0.034	ND		* 0.183		0.122		* 0.315
4,4'-DDE		0.356		* 1.419		0.089		* 0.337
2,4'-DDE	0.018	ND		0.062	0.018	ND	0.018	ND
Total DDT		**0.582**		* **2.308**		**0.461**		* **1.394**
Endosulfan I	0.030	ND		0.040	0.030	ND	0.030	ND
Endosulfan II	0.034	ND	0.034	ND	0.034	ND	0.034	ND
Endosulfan sulfate	0.024	ND	0.024	ND		0.13		* 0.20
Heptachlor	0.022	ND	0.022	ND	0.022	ND	0.022	ND
Heptachlor epoxide		0.02	0.034	ND		0.06	0.034	ND
Industrial Chemicals	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
PCB 8	0.060	ND	0.060	ND	0.060	ND	0.060	ND
PCB 18	0.028	ND		0.069	0.028	ND		* 0.32
PCB 28	0.034	ND		* 0.594	0.034	ND		* 0.74
PCB 44		0.140		* 0.382		0.125		* 0.418
PCB 49		0.044		* 0.576		0.169		* 0.77
PCB 52		0.128		* 0.95		0.285		* 2.16
PCB 66		0.046		* 0.571		0.317		* 0.58
PCB 87		0.025		* 0.147		0.033		* 0.084
PCB 101		0.108		* 0.757		0.542		1.01
PCB 105		0.021		* 0.129		0.141		* 0.204
PCB 118		0.077		* 0.477		0.265		* 0.635
PCB 128	0.030	ND		* 0.093		0.186		* 0.280
PCB 138		0.074		* 0.629		1.452		* 1.84
PCB 153		0.105		* 0.803		2.11		* 2.66
PCB 170		0.015		* 0.169		0.403		* 0.497
PCB 180		0.014		* 0.179		0.883		* 1.032
PCB 183	0.022	ND		* 0.083		0.360		* 0.410
PCB 184	0.048	ND	0.048	ND	0.048	ND	0.048	ND
PCB 187		0.030		* 0.245		0.864		* 1.063
PCB 195		0.014		* 0.042		0.165		* 0.234
PCB 206		0.009		* 0.063		0.316		* 0.401
PCB 209		0.018		* 0.057		0.292		* 0.405
Total PCB		**1.96**		* **14.1**		**18.0**		* **31.6**
1,4-Dichlorobenzene		0.166		* 0.251		0.156		0.249

Table 3a. (Continued) **EA Job No. 6350601**

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
PAH's	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Naphthalene		1.154		* 1.738		1.554		1.892
Acenaphthylene		0.081		* 0.456		0.092		* 0.460
Acenaphthene		0.172		* 0.446		0.232		* 0.472
Fluorene		0.372		* 0.635		0.206		* 0.391
Phenanthrene		2.53		* 4.41		0.171		0.419
Anthracene		0.197		* 1.38		0.615		* 1.458
Fluoranthene		1.54		* 13.2		0.315		* 4.39
Pyrene		1.118		* 16.8		0.194		* 6.2
Benzo(a)anthracene		0.185		* 4.90		0.118		* 1.545
Chrysene		0.49		* 7.41		0.182		* 3.26
Benzo(b)fluoranthene		0.182		* 5.04		0.053		* 1.411
Benzo(k)fluoranthene		0.212		* 5.83		0.047		* 2.04
Benzo(a)pyrene		0.178		* 4.74		0.103		* 1.796
Indeno(1,2,3-cd)pyrene		0.076		* 2.176		0.046		* 0.997
Dibenzo(a,h)antracene		0.042		* 0.621		0.040		0.257
Benzo(g,h,i)perylene		0.127		* 3.024		0.054		* 1.345
Total PAH's		**8.66**		* **72.8**		**4.02**		* **28.3**
Dioxins	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)
2378 TCDD	0.580	ND		0.228	0.760	ND	1.386	ND
12378 PeCDD	0.716	ND	0.478	ND	1.206	ND	1.740	ND
123478 HxCDD	0.952	ND	0.578	ND	1.338	ND	2.334	ND
123678 HxCDD	0.892	ND		0.377	1.334	ND	2.326	ND
123789 HxCDD	1.196	ND		0.445	1.308	ND	2.310	ND
1234678 HpCDD	1.040	ND		* 6.180		3.22		* 12.43
1234789 OCDD		5.2		* 67.88		16.93		* 113.90
2378 TCDF	0.380	ND		* 1.487		5.080		* 10.768
12378 PeCDF	0.476	ND		0.230	0.856	ND	1.590	ND
23478 PeCDF	0.468	ND		0.268	0.918	ND	1.664	ND
123478 HxCDF	0.446	ND	0.336	ND	0.784	ND	1.222	ND
123678 HxCDF	0.424	ND	0.308	ND	0.752	ND	1.118	ND
234678 HxCDF	0.428	ND		0.216	0.740	ND	1.100	ND
123789 HxCDF	0.558	ND	0.384	ND	0.888	ND	1.396	ND
1234678 HpCDF		0.444		* 2.392		1.524		* 4.728
1234789 HpCDF	0.662	ND	0.348	ND	0.702	ND	1.436	ND
12346789 OCDF		1.33		2.095	0.93	ND		* 4.069

ND = Not detected
Concentrations shown are the mean of 5 replicate analyses in wet weight.
For values reported as ND (not detected), one-half of the detection limit is used in the calculation of the mean concentration.
* = Statistically significant at the 95% confidence level.

Total PAH = Sum of all PAH's.
(If all PAHs are ND, the total is reported as ND)

Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
(If all DDT metabolites are ND, the total is reported as ND)

Total PCB = 2(x), where x = sum of PCB congeners
(If all PCB congeners are ND, the total is reported as ND)

EA Job No. 6350601

TABLE 3b. 28 DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE
Wet weight concentrations
NWS Earle Area B2

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)
Ag		0.066		0.053		0.037		0.021
As		4.42		4.45		2.52		1.98
Cd		0.144		0.051		0.131		0.059
Cr		0.476		* 1.061		0.187		0.670
Cu		1.57		* 2.09		0.93		* 1.35
Hg		0.016		* 0.018		0.022		0.024
Ni		0.628		0.909	0.300	ND		0.386
Pb		0.118		* 0.594		0.153		* 0.565
Zn		16.0		13.9		20.4		21.2
Pesticides	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Aldrin		0.20	0.028	ND	0.028	ND	0.028	ND
a-Chlordane		0.090		* 0.194		0.077		* 0.248
trans Nonachlor		0.04		* 0.113		0.214		* 0.308
Dieldrin		0.027		* 0.149		0.118		* 0.372
4,4'-DDT	0.024	ND	0.024	ND	0.024	ND	0.024	ND
2,4'-DDT	0.034	ND	0.034	ND	0.034	ND	0.034	ND
4,4'-DDD		0.171		* 0.570		0.212		* 0.793
2,4'-DDD	0.034	ND		* 0.170		0.122		* 0.336
4,4'-DDE		0.356		* 1.355		0.089		* 0.281
2,4'-DDE	0.018	ND		* 0.079	0.018	ND	0.018	ND
Total DDT		**0.582**		* **2.203**		**0.461**		* **1.448**
Endosulfan I	0.030	ND	0.030	ND	0.030	ND	0.030	ND
Endosulfan II	0.034	ND	0.034	ND	0.034	ND	0.034	ND
Endosulfan sulfate	0.024	ND	0.024	ND		0.13		0.18
Heptachlor	0.022	ND	0.022	ND	0.022	ND	0.022	ND
Heptachlor epoxide		0.02	0.034	ND		0.06	0.034	ND
Industrial Chemicals	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
PCB 8	0.060	ND	0.060	ND	0.060	ND	0.060	ND
PCB 18	0.028	ND	0.028	ND	0.028	ND		* 0.37
PCB 28	0.034	ND		* 0.576	0.034	ND		* 0.59
PCB 44		0.140		* 0.387		0.125		* 0.446
PCB 49		0.044		* 0.588		0.169		* 0.73
PCB 52		0.128		* 0.89		0.285		* 1.57
PCB 66		0.046		* 0.586		0.317		* 0.55
PCB 87		0.025		* 0.111		0.033		* 0.086
PCB 101		0.108		* 0.671		0.542		* 1.17
PCB 105		0.021		* 0.122		0.141		* 0.238
PCB 118		0.077		* 0.452		0.265		* 0.642
PCB 128	0.030	ND		* 0.114		0.186		* 0.280
PCB 138		0.074		* 0.628		1.452		* 1.87
PCB 153		0.105		* 0.713		2.11		* 2.68
PCB 170		0.015		* 0.156		0.403		* 0.500
PCB 180		0.014		* 0.163		0.883		* 1.066
PCB 183	0.022	ND		* 0.075		0.360		* 0.426
PCB 184	0.048	ND	0.048	ND	0.048	ND	0.048	ND
PCB 187		0.030		* 0.252		0.864		* 1.118
PCB 195		0.014		* 0.030		0.165		* 0.226
PCB 206		0.009		* 0.046		0.316		* 0.399
PCB 209		0.018		* 0.043		0.292		* 0.356
Total PCB		**1.96**		* **13.3**		**18.0**		* **30.7**
1,4-Dichlorobenzene		0.166		0.145		0.156		0.191

TABLE 3b. (Continued) **EA Job No. 6350601**

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
PAH's	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Naphthalene		1.154		* 1.452		1.554		* 1.994
Acenaphthylene		0.081		* 0.475		0.092		* 0.403
Acenaphthene		0.172		* 0.473		0.232		* 0.744
Fluorene		0.372		* 0.688		0.206		* 0.588
Phenanthrene		2.53		* 3.95		0.171		0.425
Anthracene		0.197		* 1.40		0.615		* 1.864
Fluoranthene		1.54		* 14.4		0.315		* 5.56
Pyrene		1.118		* 16.8		0.194		* 7.2
Benzo(a)anthracene		0.185		* 4.91		0.118		* 1.141
Chrysene		0.49		* 6.75		0.182		* 2.81
Benzo(b)fluoranthene		0.182		* 4.88		0.053		* 1.254
Benzo(k)fluoranthene		0.212		* 5.34		0.047		* 1.88
Benzo(a)pyrene		0.178		* 3.76		0.103		* 1.548
Indeno(1,2,3-cd)pyrene		0.076		* 1.750		0.046		* 0.744
Dibenzo(a,h)antracene		0.042		* 0.488		0.040		0.149
Benzo(g,h,i)perylene		0.127		* 2.352		0.054		* 1.073
Total PAH's		**8.66**		* **69.9**		**4.02**		* **29.4**
Dioxins	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)
2378 TCDD	0.580	ND	0.304	ND	0.760	ND	1.470	ND
12378 PeCDD	0.716	ND	0.526	ND	1.206	ND	1.982	ND
123478 HxCDD	0.952	ND	0.616	ND	1.338	ND	2.252	ND
123678 HxCDD	0.892	ND		0.352	1.334	ND		1.476
123789 HxCDD	1.196	ND		0.427	1.308	ND	2.322	ND
1234678 HpCDD	1.040	ND		* 5.378		3.22		* 15.54
1234789 OCDD		5.2		* 61.44		16.93		* 164.06
2378 TCDF	0.380	ND		1.208		5.080		* 12.540
12378 PeCDF	0.476	ND		0.154	0.856	ND	1.670	ND
23478 PeCDF	0.468	ND		0.224	0.918	ND	1.704	ND
123478 HxCDF	0.446	ND	0.396	ND	0.784	ND	1.416	ND
123678 HxCDF	0.424	ND	0.374	ND	0.752	ND	1.336	ND
234678 HxCDF	0.428	ND	0.378	ND	0.740	ND	1.334	ND
123789 HxCDF	0.558	ND	0.444	ND	0.888	ND	1.636	ND
1234678 HpCDF		0.444		* 2.088		1.524		* 6.090
1234789 HpCDF	0.662	ND	0.442	ND	0.702	ND	1.416	ND
12346789 OCDF		1.33		2.336	0.93	ND		* 5.616

ND = Not detected
Concentrations shown are the mean of 5 replicate analyses in wet weight.
For values reported as ND (not detected), one-half of the detection limit is used in the calculation of the mean concentration.
* = Statistically significant at the 95% confidence level.

Total PAH = Sum of all PAH's.
(If all PAHs are ND, the total is reported as ND)

Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
(If all DDT metabolites are ND, the total is reported as ND)

Total PCB = 2(x), where x = sum of PCB congeners
(If all PCB congeners are ND, the total is reported as ND)

EA Job No. 6350601

TABLE 3c. 28 DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE
Wet weight concentrations
NWS Earle Area C1

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)
Ag		0.066		0.047		0.037		0.022
As		4.42		4.35		2.52		2.15
Cd		0.144		0.059		0.131		0.067
Cr		0.476		0.335		0.187		* 1.040
Cu		1.57		* 1.89		0.93		* 1.31
Hg		0.016		0.016		0.022		0.023
Ni		0.628		0.528	0.300	ND		* 0.642
Pb		0.118		* 0.479		0.153		* 0.464
Zn		16.0		14.3		20.4		24.1
Pesticides	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Aldrin		0.20	0.028	ND	0.028	ND	0.028	ND
a-Chlordane		0.090		0.117		0.077		* 0.171
trans Nonachlor		0.04		* 0.057		0.214		* 0.251
Dieldrin		0.027		* 0.106		0.118		* 0.278
4,4'-DDT	0.024	ND	0.024	ND	0.024	ND	0.024	ND
2,4'-DDT	0.034	ND	0.034	ND	0.034	ND	0.034	ND
4,4'-DDD		0.171		* 0.344		0.212		* 0.480
2,4'-DDD	0.034	ND		* 0.120		0.122		* 0.264
4,4'-DDE		0.356		* 1.032		0.089		* 0.275
2,4'-DDE	0.018	ND		* 0.076	0.018	ND	0.018	ND
Total DDT		**0.582**		* **1.601**		**0.461**		* **1.057**
Endosulfan I	0.030	ND	0.030	ND	0.030	ND	0.030	ND
Endosulfan II	0.034	ND	0.034	ND	0.034	ND		0.05
Endosulfan sulfate	0.024	ND	0.024	ND		0.13		* 0.23
Heptachlor	0.022	ND	0.022	ND	0.022	ND	0.022	ND
Heptachlor epoxide		0.02	0.034	ND		0.06	0.034	ND
Industrial Chemicals	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
PCB 8	0.060	ND	0.060	ND	0.060	ND	0.060	ND
PCB 18	0.028	ND	0.028	ND	0.028	ND		* 0.36
PCB 28	0.034	ND		* 0.468	0.034	ND		* 0.57
PCB 44		0.140		* 0.391		0.125		* 0.423
PCB 49		0.044		* 0.617		0.169		* 0.87
PCB 52		0.128		* 0.87		0.285		* 1.91
PCB 66		0.046		* 0.536		0.317		* 0.59
PCB 87		0.025		* 0.107		0.033		* 0.093
PCB 101		0.108		* 0.720		0.542		* 1.25
PCB 105		0.021		* 0.146		0.141		* 0.217
PCB 118		0.077		* 0.520		0.265		* 0.676
PCB 128	0.030	ND		* 0.104		0.186		* 0.267
PCB 138		0.074		* 0.610		1.452		* 1.90
PCB 153		0.105		* 0.724		2.11		* 2.71
PCB 170		0.015		* 0.183		0.403		* 0.488
PCB 180		0.014		* 0.149		0.883		* 1.048
PCB 183	0.022	ND		* 0.074		0.360		* 0.434
PCB 184	0.048	ND	0.048	ND	0.048	ND	0.048	ND
PCB 187		0.030		* 0.215		0.864		* 1.125
PCB 195		0.014		0.022		0.165		* 0.236
PCB 206		0.009		* 0.071		0.316		* 0.379
PCB 209		0.018		* 0.038		0.292		* 0.336
Total PCB		**1.96**		* **13.3**		**18.0**		* **31.9**
1,4-Dichlorobenzene		0.166		0.158		0.156		0.185

Table 3c. (Continued) **EA Job No. 6350601**

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
PAH's	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Naphthalene		1.154		* 1.404		1.554		* 2.528
Acenaphthylene		0.081		* 0.333		0.092		* 0.322
Acenaphthene		0.172		* 0.327		0.232		* 0.495
Fluorene		0.372		* 0.513		0.206		* 0.403
Phenanthrene		2.53		3.06		0.171		0.410
Anthracene		0.197		* 0.75		0.615		* 1.520
Fluoranthene		1.54		* 9.1		0.315		* 4.17
Pyrene		1.118		* 13.2		0.194		* 6.4
Benzo(a)anthracene		0.185		* 2.93		0.118		* 1.115
Chrysene		0.49		* 3.94		0.182		* 2.41
Benzo(b)fluoranthene		0.182		* 3.42		0.053		* 1.244
Benzo(k)fluoranthene		0.212		* 3.55		0.047		* 1.76
Benzo(a)pyrene		0.178		* 2.67		0.103		* 1.277
Indeno(1,2,3-cd)pyrene		0.076		* 1.229		0.046		* 0.786
Dibenzo(a,h)antracene		0.042		* 0.360		0.040		* 0.204
Benzo(g,h,i)perylene		0.127		* 1.762		0.054		* 1.048
Total PAH's		**8.66**		* **48.5**		**4.02**		* **26.1**
Dioxins	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)
2378 TCDD	0.580	ND		0.236	0.760	ND	1.610	ND
12378 PeCDD	0.716	ND	0.462	ND	1.206	ND	1.862	ND
123478 HxCDD	0.952	ND	0.556	ND	1.338	ND	2.354	ND
123678 HxCDD	0.892	ND	0.542	ND	1.334	ND	2.290	ND
123789 HxCDD	1.196	ND	0.534	ND	1.308	ND	2.222	ND
1234678 HpCDD	1.040	ND		* 3.333		3.22		* 10.17
1234789 OCDD		5.2		* 46.58		16.93		* 106.36
2378 TCDF	0.380	ND		* 1.075		5.080		* 10.728
12378 PeCDF	0.476	ND	0.368	ND	0.856	ND	1.632	ND
23478 PeCDF	0.468	ND	0.380	ND	0.918	ND	1.626	ND
123478 HxCDF	0.446	ND	0.340	ND	0.784	ND	1.368	ND
123678 HxCDF	0.424	ND	0.316	ND	0.752	ND	1.318	ND
234678 HxCDF	0.428	ND	0.328	ND	0.740	ND	1.238	ND
123789 HxCDF	0.558	ND	0.396	ND	0.888	ND	1.620	ND
1234678 HpCDF		0.444		* 1.462		1.524		* 4.866
1234789 HpCDF	0.662	ND	0.424	ND	0.702	ND	1.094	ND
12346789 OCDF		1.33		0.975	0.93	ND		3.333

ND = Not detected
Concentrations shown are the mean of 5 replicate analyses in wet weight.
For values reported as ND (not detected), one-half of the detection limit is used in the calculation of the mean concentration.
* = Statistically significant at the 95% confidence level.

Total PAH = Sum of all PAH's.
(If all PAHs are ND, the total is reported as ND)

Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
(If all DDT metabolites are ND, the total is reported as ND)

Total PCB = 2(x), where x = sum of PCB congeners
(If all PCB congeners are ND, the total is reported as ND)