DEPARTMENT OF DEFENSE

Department of the Navy

Record of Decision for Outdoor Research, Development, Test and Evaluation Activities, Naval Surface Warfare Center, Dahlgren Division, Dahlgren, Virginia

AGENCY: Department of the Navy, Department of Defense (DoD).

ACTION: Record of Decision.

SUMMARY: The United States Department of the Navy (Navy), after carefully weighing the strategic operational and environmental consequences of the proposed action, announces its decision to expand the Naval Surface Warfare Center, Dahlgren Division's (NSWCDD) outdoor research, development, test and evaluation (RDT&E) activities within the Potomac River Test Range (PRTR) complex, the Explosives Experimental Area (EEA) range complex, the Mission Area, and special-use airspace at Naval Support Facility (NSF) Dahlgren. These activities include outdoor operations that require the use of ordnance (guns and explosives), electromagnetic (EM) energy, high energy (HE) lasers, chemical and biological (chem/bio) simulants (non-toxic substances used to mimic dangerous agents), and PRTR use. The Navy has decided to implement the preferred alternative, Alternative 2, which will enable NSWCDD to meet current and future mission-related warfare and force-protection requirements by providing RDT&E of surface ship combat systems, ordnance, lasers and directed energy systems, force-level warfare, and homeland and force protection.

In the Final Environmental Impact Statement (EIS), the Navy evaluated direct, indirect, and potential cumulative environmental effects associated with implementation of the outdoor RDT&E activities and addressed methods to avoid, reduce or minimize impacts to affected resources. The Final EIS analysis determined that all alternatives would result in no significant impacts and therefore, will not contribute significantly to cumulative impacts on any of the resources analyzed.

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SUPPLEMENTARY INFORMATION: Pursuant to Section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969, 42 United States Code (U.S.C.) Section 4331 *et seq.*, the regulations of the Council on Environmental Quality for Implementing the Procedural Provisions of NEPA (Title 40 Code of Federal Regulations [CFR] parts 1500-1508), and the Department of Navy Regulations (32 CFR Part 775), the Navy announces its decision to expand NSWCDD's outdoor RDT&E activities within the Potomac River Test Range (PRTR) complex, the Explosives Experimental Area (EEA) range complex, the Mission Area, and special-use airspace at Naval Support Facility (NSF) Dahlgren. This decision will enable the Navy to meet current and future mission-related warfare and force-protection requirements by providing RDT&E of surface ship combat systems, ordnance, lasers and directed-energy systems, force-

level warfare, and homeland and force protection. This decision supports outdoor RDT&E activities that enable the Navy and other stakeholders to successfully meet current and future national and global defense challenges by developing a robust capability to carry out assigned RDT&E activities on range complexes, in the Mission Area, and in special-use airspace at NSF Dahlgren.

The Navy consulted with the National Marine Fisheries Service (NMFS) for species protected under Section 7 of the Endangered Species Act (ESA) and for Essential Fish Habitat (EFH) as established under the Magnuson-Stevens Fishery Conservation and Management Act (MFA); Maryland and Virginia State Historic Preservation Officers (SHPOs) for archeological and architectural resources protected under Section 106 of the National Historic Preservation Act (NHPA); and the Virginia Department of Environmental Quality (VDEQ) and Maryland Department of the Environment (MDE) under the Coastal Zone Management Act (CZMA).

After completion of the consultation process, the Navy determined that the outdoor RDT&E activities may affect but is not likely to adversely affect ESA protected species, will not substantially adversely affect EFH or Habitat Areas of Particular Concern (HAPC), will not adversely affect cultural resources, and is consistent to the maximum extent practicable with the enforceable policies of Virginia's and Maryland's coastal zone management programs. The EIS process considered applicable Executive Orders (EO), including EO 11990, *Protection of Wetlands*; EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds;* EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations;* EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks;* and EO 11593, *Protection and Enhancement of the Cultural Environment.*

The Navy ensured that Federal agencies, state agencies, local entities, non-governmental organizations, and members of the public or interested parties had the opportunity to provide comments during the public scoping period, the Draft EIS public comment period, and the Final EIS wait period. Throughout the EIS process, the public was provided the opportunity to obtain information on the status and progress of the proposed actions and the EIS through the NSWCDD Public Affairs Office and project website.

BACKGROUND: The Navy established NSWCDD in 1918 as an over-water proving ground for naval ordnance. The PRTR Complex is the nation's largest fully-instrumented, over-the-water gun-firing range. Set in a shallow-water coastal, or littoral, environment bounded by land, the PRTR replicates the littoral areas of the world where almost 45 percent of the world's population lives and in which the Navy operates. As the focus of warfare has shifted from deep water to coastal regions, testing equipment and technology in a littoral environment similar to those environments in which they will be deployed has become critical to ensure that warfare systems work as designed.

Purpose and Need

The purpose of the outdoor RDT&E activities is to enable NSWCDD to meet current and future mission-related warfare and force-protection requirements by providing RDT&E of surface ship combat systems, ordnance, lasers and directed-energy systems, force-level warfare, and homeland and force protection. Under 10 U.S.C. § 5062(d): "The Navy shall develop aircraft, weapons, tactics, technique, organization, and equipment of naval combat and service elements."

The need for the outdoor RDT&E activities is to enable the Navy and other stakeholders to successfully meet current and future national and global defense challenges required under 10 U.S.C § 5062(d) by developing a robust capability to carry out assigned RDT&E activities on range complexes, in the Mission Area, and in special-use airspace at NSF Dahlgren.

Public Involvement

To ensure that the full range of issues related to the proposed action were addressed, the Navy published a Notice of Intent (NOI) to prepare an EIS in the Federal Register on 18 June 2007 (72 FR 33456), commencing the 45-day public scoping period ending 14 August 2007. The NOI provided information on the proposed action, public scoping meetings, comment submittal and deadline. The NOI was also posted on the project website: http://www.navsea.navy.mil/nswc/dahlgren/EIS/index.aspx. The Navy placed notices in local newspapers including the: *Westmoreland News* (11 and 18 July 2007), *Northumberland Echo* (11 and 18 July 2007), *Fredericksburg Free Lance-Star* (11 and 22 July 2007), *Dahlgren Journal* (11 and 18 July 2007), *Dahlgren Source* (July 2007 issue), and *Maryland Independent* (20 and 23 July 2007). Notices of the public scoping meetings were mailed to Federal, state, and local government entities and elected officials, local community associations, and members of the general public.

The Navy held five public scoping meetings from 23-31 July 2007 at: Shiloh Baptist Church, King George, VA; St. Mary's Episcopal Church, Colonial Beach, VA; Callao Rescue Squad Hall, Callao, VA; LaPlata Volunteer Fire Department, LaPlata, MD; and Christ Episcopal Church, Chaptico, MD. The Navy received 57 scoping comments. The majority of the comments reflected concerns regarding noise and vibration, NSWCDD's mission, public safety, human health, and the environment. The Navy considered all comments received during the scoping period in the preparation of the Draft EIS and formally responded to the comments in the Draft EIS. The comments received during this public scoping process provided the framework for the issues and concerns that were addressed in the Scoping Meetings Summary Report.

On 17 August 2012, the United States Environmental Protection Agency (USEPA) published a Notice of Availability (NOA) of the Draft EIS in the *Federal Register* (77 FR 49792) and on 24 August 2012 the Navy published the Notice of Public Hearing (NOPH) in the Federal Register (77 FR 51528). The publication of the USEPA NOA initiated the 45-day public comment period that ended 01 October 2012. The Navy also placed notices of the Draft EIS in the following local newspapers: *Maryland Independent* (29 August 2012), *Northumberland Echo* (29 August 2012), *Westmoreland News* (29 August 2012), *Northern Neck News* (29 August 2012), *King George Journal* (29 August 2012), and *Fredericksburg Free Lance-Star* (28 August 2012). The NOA and NOPH were mailed to Federal, state, and local government entities and elected officials, local community associations, and members of the general public. The Draft EIS was made available for review in five local libraries, on the project website, or by mail.

The Navy held three public hearings on the Draft EIS on 11-13 September 2012 at the: Newburg Volunteer Rescue Squad and Fire Department, Newburg, MD; A.T. Johnson Alumni Museum, Montross, VA; and Mary Washington University-Dahlgren Campus, King George, VA. Attendees included representatives from Federal, state, and local agencies, and the general public. The Navy received 156 comments on the Draft EIS. The majority of the comments

reflected concerns regarding noise and vibration, ordnance, chemical and biological simulants, water quality, water resources and wetlands, and biological resources. The Navy reviewed all comments received on the Draft EIS and formally responded to them in the Final EIS.

The USEPA published a NOA of the Final EIS in the Federal Register (78 FR 48672) on 09 August 2013, which initiated a 31-day wait period that concluded on 09 September 2013. The Navy also placed notices of the Final EIS in the following local newspapers: *Maryland Independent* (7 August 2013), *Northumberland Echo* (7 August 2013), *Westmoreland News* (7 August 2013), *Northern Neck News* (7 August 2013), *King George Journal* (7 August 2013), and *Fredericksburg Free Lance-Star* (7 August 2013).

The Final EIS identified the Navy's preferred alternative for implementing outdoor RDT&E activities, other alternatives considered by the Navy, and detailed analyses of the environmental impacts of the alternatives. The Final EIS reflects public and agency comments on the Draft EIS, the Navy's responses, and additional information received from reviewers. The Final EIS provides the decision-maker with a comprehensive review of the potential environmental consequences of the preferred alternative and other alternatives. During the 31-day wait period following publication of the NOA of the Final EIS, the Navy received 42 additional comments, none of which raised new, substantive issues that had not already been addressed in the Draft EIS or Final EIS and none of which required a response.

Alternatives Considered

The Navy initially evaluated a range of alternatives that would meet the purpose and need of the outdoor RDT&E activities and applied screening criteria to identify those alternatives that were "reasonable" (i.e., practical) from a military mission, operations, technical, and economic standpoint. Selection criteria included:

1. Accommodate historical, current, and baseline RDT&E mission requirements for activities that have the potential to affect human health and/or the environment, including ordnance, use of EM energy, HE lasers, chemical simulants, and PRTR;

2. Accommodate known future requirements, which include the use of biological simulants alone;

3. Accommodate a margin of growth for those programs for which it is difficult to accurately forecast future needs, including mixtures of biological and chemical simulants; and

4. Minimize impacts to commercial and recreational use of the Potomac River. Alternatives that met the screening criteria were carried forward in the EIS analysis.

The Navy considered an alternative that would utilize the range complexes, Mission Area, and special-use airspace to the maximum extent possible in order to accommodate the maximum amount of growth in mission operations. The Navy determined this alternative to be unreasonable because it would negatively affect commercial and recreational use of the Potomac River, hence did not meet selection criterion 4. The Navy also concluded that no other location

for expanding NSWCDD's programs was a reasonable alternative because of the unnecessary disturbance, delays, and costs it would create, without any additional benefit.

The Navy determined that three alternatives would be carried forward in the EIS analysis:

1) No-Action Alternative – includes baseline activity levels for the portion of NSWCDD's outdoor activities that have the potential to affect the human environment (activities involving ordnance, the use of EM energy and HE lasers, the use of chemical simulants, and the use of the PRTR). The No-Action Alternative is the Environmentally Preferable Alternative.

2) Alternative 1 – includes baseline activity levels plus reflects the growth necessary to meet the minimum RDT&E mission requirements in the reasonably foreseeable future. Increases in current activities would be as follows: 108 percent for laser events, 20 percent for EM energy events, 325 percent for small-arms firing, 5 percent for detonations, 400 percent for chem/bio events, and 16 percent for PRTR hours of use. Large-caliber gun activities would remain at baseline levels. This alternative includes outdoor use of chemical and biological simulants tested separately.

3) Alternative 2 (Preferred Alternative) – provides for roughly 15 percent growth in activity levels above Alternative 1, averaged across activities. There would be increases in all activities except large-caliber gun activities, which would remain at baseline levels. It satisfies current baseline requirements, includes the growth necessary to meet minimum RDT&E mission requirements for the reasonably foreseeable future, includes the use of biological and chemical simulants together and separately, and includes a margin of growth for the most actively evolving programs – those for which the numbers of future annual test events, firings, and hours of use are harder to predict because of the uncertainties inherent in carrying out RDT&E. Alternative 2 is the Navy's preferred alternative because it would support an increased level of outdoor RDT&E activities in the foreseeable future, thus optimizing NSWCDD's activities on ranges and the Mission Area, without significantly increasing environmental impacts. This alternative would improve NSWCDD's operational capability and flexibility to provide mission support to the Navy and other services and organizations utilizing NSWCDD's RDT&E programs.

No-Action Alternative Components

Under the No-Action Alternative, outdoor RDT&E activities, including use of ordnance, EM energy, HE lasers, and chemical defense activities would continue at their current levels, as described below. Events are defined as tests that take place on one day under one standard operating procedure (SOP).

Ordnance Activities

Ordnance activities under the No Action Alternative include large-caliber guns/projectiles (greater than 20 millimeters caliber gun/projectile) with an average annual activity level (AAAL) of 4,700 projectiles, small arms (20 millimeters or less caliber gun/bullet) with an AAAL of 6,000 bullets, and an AAAL of 190 detonations.

NSWCDD's large caliber guns fire either live (explosive) or inert (non-explosive) projectiles. Each steel projectile fired from a gun counts as one of the approximately 4,700 projectiles fired

annually. Many of the projectiles go into the PRTR, but some projectiles fired on the Missile Test Range and Terminal Range are aimed at gun butts on land.

NSWCDD's small arms tests usually employ machine guns firing mostly inert steel bullets with small propellant charges, and producing lower noise levels that affect a smaller area than the noise resulting from firing the large-caliber guns.

Most ordnance detonations take place on the EEA's Churchill and Harris Ranges. The amount of explosives used in the ordnance that is detonated on the EEA can vary from less than 0.01 pounds (lbs) to 1,000 lbs Net Explosive Weight (NEW).

EM Energy Activities

The EM energy devices included under the No Action Alternative operate in the frequency range of 300 kilohertz (kHz) (or 300,000 cycles per second) to 300 gigahertz (GHz) (or 300 billion cycles per second) and at average powers ranging from 10 watts (W) up to 500 megawatts (MW), but with most events well below the maximum frequency range. There are approximately 490 AAAL EM events. Devices such as radios and range radars with power, frequency, and exposure levels below established thresholds for Hazards of EM Radiation to Personnel, ordnance Hazards of EM Radiation to Ordnance, fuel Hazards of EM Radiation to Fuel, and the potential for EM interference are not included in the outdoor RDT&E activities. NSWCDD coordinates with the Navy and Marine Corps Spectrum Center, which is responsible for ensuring access to and effective use of the EM spectrum in national security and military operations. Effects are possible only as the device is emitting. The time of emission is usually brief, varying from less than a second to several minutes, with no residual effects. However, one event could entail several hundred instantaneous pulses, while another event with a different device could be one single pulse of five minutes. Power levels, frequencies, and safety parameters are all delineated, and must be approved in an SOP well before the event commences.

Laser Activities

The HE lasers that are operated at NSWCDD and included under the No Action Alternative emit focused (lased) light ranging in power from 1 milliwatt (mW) to 100 kilowatt (kW) in a wavelength range from 500 nanometers (nm) to 11 micrometers (μm). The AAAL is 60 outdoor HE laser events annually.

Effects are possible only as the device is emitting. The time of emission is usually brief, varying from less than a second to several minutes, and there are no residual effects. However, one event could entail several hundred instantaneous pulses while another event with a different device could be one single pulse of five minutes. Power levels, frequencies, and safety parameters are all delineated, and must be approved in an SOP well before the event commences.

Chemical Defense Activities

Operations using chemical simulants have been conducted outdoors on NSF Dahlgren since 1980. The quantities of simulant used for an event may vary depending on the tests being conducted. Tests may include small quantities of a number of simulants or larger quantities of one or two simulants, consisting of no more than 20 gallons of simulant per test. The AAAL is 12 chemical defense events annually. There may be more than one test during one event. The chemicals tested are influenced by parameters such as global threats, homeland security, and technological developments.

PRTR Use

When NSWCDD is using the PRTR for mission activities, public access to the part of the range in use is restricted. Under the No Action Alternative, only access to the part of the Middle Danger Zone (MDZ) or upper Lower Danger Zone (LDZ) in use is restricted. The types of activities conducted on the Upper Danger Zone (UDZ) and mid-to-lower LDZ do not require that public access to these danger zones be restricted. Access to the MDZ or part of the MDZ or LDZ currently is restricted an AAAL of 750 hours a year, based on the hours that range control boats are deployed.

Alternative 1 Components

Alternative 1 RDT&E outdoor activity levels were determined by combining the No Action Alternative activity levels with activity-specific growth above those levels necessary to meet minimum known requirements in the near future. Under Alternative 1, activity levels would increase by 325 percent for small-arms firing with an AAAL of 25,500 bullets, 5 percent for detonations with an AAAL of 200 detonations, 20 percent for EM energy events with an AAAL of 590 events, 108 percent for laser events with an AAAL of 125 events, 400 percent for chem/bio defense events with an AAAL of 60 events (chemical and biological simulants used separately), and 16 percent for PRTR hours of use with an AAAL of 870 restricted hours. Activity levels for large-caliber guns/projectiles would remain at current baseline levels and therefore, would represent a zero percent increase.

Ordnance Activities

The tempo of large-caliber gun testing is expected to remain relatively constant for the foreseeable future. NSWCDD expects the number of large-caliber projectiles fired in the foreseeable future to remain at current levels and for the ratio of inert and explosive projectiles to remain constant. Currently, large-caliber guns would be fired typically from 8 am to 5 pm, Monday through Friday into the MDZ and occasionally into the upper LDZ. EM launchers, a type of large-caliber gun, would fire inert, shaped steel projectiles at conventional targets on the land and river ranges in addition to current firing into catchment facilities.

To address the Navy's goal of developing longer-range guns and projectiles, in the future large-caliber guns would be fired into a target area from 32,000 to 35,000 yards in the upper LDZ up to 10 days a year. This represents an increase over recent firing levels in this target area, but overall AAAL of projectiles fired will not increase.

The number of bullets fired from small arms is expected to increase under Alternative 1 from the current average of 6,000 up to an average of 25,500 per year to support projected Marine Corps requirements for small arms and related systems evaluation and development. All ammunition would be steel and inert.

Fragmentation arena tests on the Churchill Range are expected to increase in the future, leading to an increase in average annual detonations from the current AAAL of 190 detonations to 200 detonations under Alternative 1.

EM Energy

Under Alternative 1, the number of annual average events using EM energy would increase from the current AAAL levels of 490 to 590 events annually. Future directed-energy emissions being tested outdoors would include high-power microwave and radio frequency (RF) emissions; directed EM energy sensors and emitters may be mobile.

Because of the rapidly growing role of unmanned systems (UMSs) in modern warfare, NSWCDD testing would involve greater use of unmanned aerial vehicles (UAVs), unmanned ground vehicles (UGVs), and unmanned surface vehicles (USVs). The number of outdoor events using directed energy, excluding EM sensors, would increase above current levels. UAVs, UGVs, and USVs may be used as mobile targets for beams of directed energy. The aim of targeting might be a UMS, but UAVs would only be tracked, not disabled or destroyed. EM energy may be used to electronically track, disable, or destroy USVs on the MDZ.

UAVs could also be used as relay platforms to communicate from a land range or vessel on the PRTR to USVs or transmission targets on various platforms in the UDZ, MDZ, LDZ, or to targets on the land ranges. EM energy emitted from a land range or a vessel on the PRTR may be reflected off a UAV or similar airborne platform over the horizon to a target on the land ranges or a platform located in the UDZ, MDZ, or LDZ.

Some EM energy operations would take place beyond the normal 8 am to 5 pm, Monday-to-Friday PRTR range schedule because of the increasing need to test systems in all kinds of weather conditions and at dawn, dusk, and at night.

Lasers

Under Alternative 1, the average number of HE laser events would increase from current levels of AAAL 60 events to 125 events annually. The maximum HE laser power levels would increase from current levels of 100 kW to 500 kW. The sizes of targets and types and thickness of backstop material would increase proportionally to absorb the increased energy. HE lasers would be directed from sources on land ranges over the waters of the PRTR to targets (e.g., barges) that would be located on the waters of the MDZ at varying distances from the source.

Some HE laser operations under Alternative 1 would involve directing HE lasers from land ranges at moving airborne targets, such as mortar shells and UAVs in flight, over the waters of the PRTR's MDZ. This would help to determine the value of employing the HE laser system for point defense against moving aerial targets and high-speed missiles. HE lasers would target UAVs by tracking them and would disable/destroy mobile targets such as USVs on the water and mortar shells in the air. If lighter-weight power sources are developed, lasers may be fired from manned and unmanned aerial vehicles at targets on the MDZ water surface.

Some HE laser operations might involve directing lasers at an airborne platform, such as a UAV, but rather than trying to destroy the platform, the laser beam would be aimed at a mirror-like surface on the airborne platform to reflect the laser beam to a target over the horizon. Lasers may be emitted from a land range or a vessel on the PRTR to targets on various platforms in the UDZ, MDZ, or LDZ or the land ranges. Initially, laser emissions would be at eye-safe, lower-power levels, with power levels gradually increasing with RDT&E.

More events would take place at dawn and dusk, when the atmosphere is thermally stable. Also, because lasers must be operated at all times of the day in order to fully evaluate their capabilities,

some laser operations would occur after dark. To help in evaluation of their performance in inclement weather, lasers may also occasionally be operated when it is rainy or foggy.

Chemical and Biological Simulants

As new chem/bio detectors, decontaminants, and collective protection systems are developed and existing ones upgraded, they will need to be operated in maritime conditions and aboard vessels over water. Future activities using chemical and biological simulants outdoors on the land and water range complexes and the Mission Area would increase from the current baseline AAAL of 12 chemical simulant events annually up to an AAAL of 60 chemical and biological simulant events. Either chemical or biological simulants will be released for each event, but chemical and biological simulants would not be tested together. The areas in which the activities may take place would expand from the areas used currently (the PRTR, EEA, and Main Range) to include all of the land ranges, the Mission Area, and the MDZ. The majority of tests would continue to occur on the PRTR.

Testing detectors in an outdoor marine/estuarine environment is essential. Stand-off detectors such as the Joint Service Lightweight Stand-off Chemical Agent Detector remotely detect chemical-agent vapors some distance from the source using a scanner, a detector, and an electronics module to process and communicate information.

Chemical simulants are chosen for their low toxicity, low environmental impacts, and ability to closely simulate, or mimic, the actual agent the sensor is designed to detect. Future operations will use simulants that have been previously tested or other ones with similar or lesser toxicities. Prior to use, all simulants would be reviewed and approved by the NSWCDD Safety and Environmental Office in consultation with NSF Dahlgren personnel, as applicable, and would only be approved after considering toxicity data relative to the intended quantity and concentration of the simulant to be used. All operations would be conducted in accordance with local, state, and Federal regulations.

Operational tests over water would be conducted on the MDZ. Prior to the operation, NSWCDD would determine where, based on wind conditions, the operation should begin to release the vapor to attain the desired vapor concentration for a particular test. Vapor releases would take place well within the boundaries of the ranges and the Mission Area, so that vapor clouds would disperse before reaching their boundaries, as determined by modeling and by monitoring weather conditions just prior to the test. Prior to releasing simulants, the MDZ would be cleared of non-participating boats and personnel by range control boats, both as a safety measure and to preclude non-background sources of Infra- Red radiation (i.e., other vessels) that could interfere with the test.

Operational tests on land could be conducted on any of the land ranges or the Mission Area. Test methods would be similar to tests on the PRTR. Operations on the PRTR or on land would be designed to determine not only whether stand-off detectors are working as designed, but also whether point detectors and protective gear are working as designed.

Repetitive tests would be conducted with each simulant or group of simulants for both land and river range operations. A typical test would involve the release of approximately 10 gallons of simulant, but the amount could vary from a few ounces up to 20 gallons of simulant. The amount of simulant used would be the minimum amount needed to test its threshold capacity or

the lowest level of simulant the sensor can detect. Thus, the concentrations produced within each vapor cloud would be extremely low.

The outdoor testing of biological simulant sensors would be similar to simulant tests using chemical simulants. NSWCDD would use only Biosafety Level (BSL)-1 organisms as simulants. BSL-1 is the lowest biosafety level and is suitable for work involving well-characterized agents not known to consistently cause disease in healthy adult humans, and of minimal potential hazard to laboratory personnel and the environment. All simulants would be approved through the NSWCDD Safety and Environmental Office in consultation with NSF Dahlgren and would only be approved after considering biosafety-level data relative to the intended use of the simulant and the purpose of the test. The amount of simulant used would be the minimum amount necessary to obtain the desired results. All tests would be conducted in accordance with local, state, and Federal regulations.

PRTR Use

The increase in activities and the requirement to test beyond normal range operations hours under Alternative 1 would result in an overall increase in the number of hours that public access to some part of the PRTR would be restricted from the current AAAL of 750 hours to approximately 870 hours annually under Alternative 1.

This would result in restricting public access to the PRTR UDZ and the LDZ approximately two times a year as compared to no restrictions under the No Action Alternative and restricting public access to the upper LDZ approximately 10 days a year for long-range, large-caliber gun firing as compared to only infrequent restrictions under the No Action Alternative.

Alternative 2 (Preferred Alternative) Components

Alternative 2 provides for roughly 15 percent growth in activity levels above Alternative 1, averaged across activities. There would be increases in all activities except large-caliber gun activities, which would remain at the current AAAL of 4,700 projectiles annually.

Under Alternative 2, activity levels would increase for small-arms firing with an AAAL of 30,000 bullets, detonations with an AAAL of 230 detonations, EM energy events with an AAAL of 680 events, laser events with an AAAL of 145 events, chem/bio simulant defense events with an AAAL of 70 events (chemical and biological simulants will be used separately and together), and PRTR hours of use with an AAAL of 1,000 restricted hours. Activity levels for large-caliber guns/projectiles would remain at current baseline AAAL levels of 4,700 projectiles and therefore, would represent a zero percent increase.

This alternative satisfies current requirements, known outdoor RDT&E scheduled for the coming years, and projected increases in tests in the foreseeable future based on current trends. It provides the flexibility required in RDT&E to accommodate future developments needed to respond to global threats, homeland security, and future missions. Alternative 2 includes the following increases above Alternative 1 levels:

- Small arms firing activities will grow by about 4,500 bullets fired annually (18 percent) above Alternative 1 levels. The number of large-caliber projectiles fired will not increase.

- Detonations on the EEA will increase by 30 annually (15 percent) above Alternative 1 levels.
- RDT&E for operations using EM energy events will increase above Alternative 1 levels by 90 (15 percent) annually;
- HE laser events will increase by 20 (16 percent) annually;
- Chem/bio simulant events will increase by 10 (17 percent) annually. Biological simulants will be tested separately and together with chemical simulants.
- NSWCDD's use of the PRTR will increase by 130 hours (15 percent) annually above Alternative 1 levels. The number of days that the UDZ and LDZ will be restricted would be similar to Alternative 1, approximately two times a year; the upper LDZ will be restricted approximately 10 days a year.

DoD's and Navy's goal is to develop detectors capable of immediately recognizing either a chemical or biological threat, or a mixture of both. Alternative 2 will include mixtures of chemical and biological simulants for this type of operation. The chemical and biological simulants used will be the same ones approved for use in the individual chemical and biological operational tests under Alternative 1. The same protective and safety measures taken for chemical-simulant testing and biological-simulant testing will be used for the combined chemical and biological sensor testing.

Alternative 2 is the Navy's preferred alternative because it will support an increased level of outdoor RDT&E activities in the foreseeable future, thus optimizing NSWCDD's activities on ranges and the Mission Area, without significantly increasing environmental impacts. This alternative will improve NSWCDD's operational capability and flexibility to provide mission support to the Navy and other services and organizations utilizing NSWCDD's RDT&E programs.

SUMMARY OF ALTERNATIVES

RDT&E Activity	No Action Alternative Activity Magnitude	No Action Alternative Average Annual Activity Levels	Alternative 1 Average Annual Activity Levels	Alternative 2 Average Annual Activity Levels (PREFERRED)
Large-caliber Guns/ Projectiles	>20 mm to 8" caliber gun/ projectile	4,700 projectiles	4,700 projectiles	4,700 projectiles
Small Arms	≤20 mm caliber gun/bullet	6,000 bullets	25,500 bullets	30,000 bullets
Detonations	<0.01 lbs to 1,000 lbs NEW	190 detonations	200 detonations	230 detonations
EM Energy	300 kHz to 300 GHz frequency 10 W to 500 MW average power	490 events	590 events	680 events
Lasers	500 nm to 11 µm wavelength 1 mW to 100 kW maximum power	60 events 100 kW maximum power	125 events 500 kW maximum power	145 events 500 kW maximum power
Chemical &	≤20 gals of	12 events	60 events	70 events

RDT&E Activity	No Action Alternative Activity Magnitude	No Action Alternative Average Annual Activity Levels	Alternative 1 Average Annual Activity Levels	Alternative 2 Average Annual Activity Levels (PREFERRED)
Biological Defense	simulant/event	Chemical simulants only	Chemical and biological simulants used separately	Chemical and biological simulants used separately and together
PRTR Use	750 hours annually	750 hours	870 hours	1,000 hours

Environmental Impacts

The EIS evaluated the potential environmental effects associated with the outdoor RDT&E activities and alternatives on environmental resources including: land use, plans, and coastal zone management; socioeconomics; utilities; air quality; noise; cultural resources; hazardous materials and waste; health and safety; geology, topography, soils, and sediments; water resources; Potomac River biological resources; Potomac River birds; NSF Dahlgren's biological resources; and protected species.

The impact analysis included an evaluation of the direct and indirect impacts for each resource and for cumulative impacts. Under Alternative 2 impacts on each resource ranged from no impact to minor impacts. There would be no significant impact to land use, plans, and coastal zone management; socioeconomics; utilities; air quality; noise; cultural resources; hazardous materials and waste; health and safety; geology, topography, soils, and sediments; water resources; Potomac River biological resources; Potomac River birds; NSF Dahlgren's biological resources; and protected species from the implementation of the preferred alternative.

Protective Measures

NSWCDD and NSF Dahlgren have developed environmental management processes, comprising the established NSWCDD Environmental Management System and Safety Program, the NSF Dahlgren Comprehensive Work Approval Process, and protective measures. Protective measures are defined as actions or best management practices taken by NSWCDD to protect sensitive resources.

The protective measures, which rely heavily on ongoing process improvements, will continue to be used as the means of reducing environmental impacts. NSWCDD identifies environmental and safety risks and responds with mitigation and protective measures based on experience from earlier RDT&E. Developing mitigation based on the projected risk when an RDT&E activity is being planned and then implementing these responsive measures when the activity takes place can effectively reduce the impact of the activity below the level where the impact would be significant.

In order to avoid or minimize potential impacts, and consistent with NSWCDD's Environmental Policy and current environmental procedures, NSWCDD will include general safety and environmental protective measures in the planning and implementation of activities under the chosen alternative. The Navy will continue to implement all current practices identified in the Final EIS to avoid or minimize potential environmental impacts. General safety and

environmental protective and mitigation measures to further avoid, minimize, or compensate for potential impacts are as follows:

General Safety and Environmental Protective Measures

- Outdoor RDT&E activities will strictly adhere to all health, safety, and environmental protocols, including Risk Hazard Assessments (RHAs), SOPs or General Operating Procedures (GOPs) with associated Operation Procedures Supplements (OPSs) that cover RDT&E activities.
- Outdoor RDT&E activities will strictly adhere to all safety zones (i.e., PRTR danger zones, Airfield Safety Zones and special-use airspace, explosive safety quantity distance arcs, unexploded ordnance areas, EM hazard arcs, and laser safety buffer zones).
- Members of the public and personnel not involved in a test are excluded from ranges and the Mission Area prior to and during tests on the waters of the PRTR through the use of patrol boats and range restrictions and on land through the use of lookouts, road barriers, and signs.
- The Range Operations Center (ROC) in general notifies the public in advance of upcoming range activities through the NSWCDD website and a toll-free telephone recording. The information given includes daily range schedules, types of tests, any substances to be used such as smoke or lights, hours of testing, where on the PRTR tests will take place, whether tests are on schedule, whether noise will be made, and contact numbers to obtain more information.
- ROC notifies the public specifically of any activities that will restrict access within and from Upper Machodoc Creek or when any test is scheduled to take place before or after normal PRTR operating hours of 8 am to 5 pm weekdays. ROC notifies the public through NSWCDD's range website, its toll-free information line, and by placing notices in local newspapers.
- ROC coordinates with the operators of private vessels via the range control boats or marine radio to minimize delays when activities are taking place on the PRTR and public access to an operational area is restricted. ROC allows vessels to pass through the operational area on the PRTR during lulls in testing; delays for smaller craft are normally no longer than one-half hour, and, for larger vessels that must use the shipping channel in the middle of the range, are normally no longer than one hour (and in most cases, less than these times).
- Noise from an activity does not exceed the standards in the Outdoor Noise Management Process. When there is a possibility that noise levels higher than policy standards may occur, mitigation measures are implemented to ensure that installation personnel and the public are not exposed to hazardous noise levels. Potential mitigation measures may include avoiding testing when weather conditions are likely to result in higher noise levels to avoid exposing the public to increased noise levels and/or single and double hearing protection for on-installation personnel conducting the testing.
- Impacts to wildlife during testing are avoided when possible or minimized. Before an activity begins, trained observers look for wildlife in the target area or test area, and alert operators if any are present. Either the test is postponed temporarily or the wildlife is startled within legally allowable means to encourage movement out of the area. Trained

observers watch for wildlife that may move into the target area or operations area during tests, and the test is stopped while they clear the area. Dead animals are removed prior to tests on land to limit the chances of scavenging wildlife's entering the test area.

- Bald eagle protection zones around active bald eagle nests are respected during the planning and execution of test activities, and, as necessary, coordination with the USFWS and the Virginia Department of Game and Inland Fisheries (VDGIF) occurs.
- Testing of new ordnance and EM directed energy and HE laser equipment scales up gradually, and monitoring takes place to ensure that higher intensity levels do not generate impacts.
- Trees, shrubs, and taller grasses and herbaceous plants that grow in range and Mission Area operating areas and are obscuring lines-of-sight are trimmed prior to tests.

For activity-specific protective measures NSWCDD would ensure that for chem/bio defense activities under the proposed action:

- Weather conditions are monitored and simulant releases modeled before chem/bio simulant tests to ensure that simulant releases stay on ranges and the Mission Area.
- Simulant concentrations are monitored during and after releases to provide feedback for future modeling and to verify that modeled levels are not exceeded. The SOP includes the distance at which vapors and aerosols are diluted to a safe level based on the simulants and maximum quantities used. It also specifies that release point will be selected so that the simulant cloud must travel this distance before landfall.
- Simulant releases are spaced so that no land or water area would be exposed multiple times to the same simulant.
- Prior to each chem/bio operation, coordination takes place with the NSF Dahlgren Environmental, the MDE and the VDEQ, as applicable, concerning the types and quantities of simulants proposed for use.

Mitigation Measures

Mitigation measures differ from protective measures in that they would be implemented specifically in response to the impact findings described in the Final EIS. The impact findings were determined in the context of the existing environmental management processes and protective measures that are integral to current and future outdoor RDT&E activities. Mitigation is and will continue to be built into current and future activities under the outdoor RDT&E activities. Because protective measures reduce the impact of outdoor RDT&E activities below the level at which the impact would be significant, no mitigation measures are necessary. NSWCDD is committed to applying the same processes used to mitigate safety and environmental impacts for current activities to all future activities under the outdoor RDT&E activities.

Agency Consultation and Coordination

The Navy consulted with the NMFS for species protected under Section 7 of the ESA and for EFH as established under the MFA, the Maryland and Virginia SHPOs for archaeological and architectural resources protected under Section 106 of the NHPA, and the VDEQ and MDE

under the CZMA; and coordinated with the USFWS for species protected under the ESA. After completion of the consultation and coordination process, the Navy determined that the outdoor RDT&E activities may affect but are not likely to adversely affect ESA-protected species, will not substantially adversely affect EFH or HAPC, will not adversely affect cultural resources, and is consistent to the maximum extent practicable with the enforceable policies of Virginia's and Maryland's coastal zone management programs.

ESA: On 23 November 2011, a Biological Assessment was sent to NMFS's Northeast Region office requesting informal consultation under Section 7(2)(a) of the ESA for the shortnose sturgeon (*Acipenser brevirostrum*), Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), loggerhead turtle (*Caretta caretta*), Kemp's ridley turtle (*Lepidochelys kempii*), and green turtle (*Chelonia mydas*) and requesting concurrence that the outdoor RDT&E activities may affect, but are not likely to adversely affect these species. On 11 January 2012, NMFS concurred that the outdoor RDT&E activities may affect, but are not likely to adversely affect, any listed or proposed species under NMFS' jurisdiction.

The USFWS indicated that two ESA-listed species, the northeastern beach tiger beetle (*Cicindela dorsalis*) and sensitive joint-vetch (*Aeschynomene virginica*), may be found in the five-county project area. The Navy determined that the beetle is not located in the project area and that there would be no effect on sensitive joint-vetch because there is no suitable habitat (tidal wetlands) present within the areas directly or indirectly affected by the proposed action.

MFA: EFH has been designated for cobia, red drum, king mackerel, Spanish mackerel, windowpane flounder, bluefish, and summer flounder in the Potomac River. In addition, HAPCs in the Potomac River have been designated for red drum and summer flounder. Consistent with Navy policy, the Navy initiated consultation with NMFS on 29 April 2013 in accordance with the MFA. On 07 June 2013, NMFS concurred with the Navy's determination that the outdoor RDT&E activities will not substantially adversely affect EFH or HAPCs.

CZMA: The Navy prepared Federal Coastal Consistency Determinations (FCDDs) for Maryland and Virginia. The FCCDs concluded that there will be no to minimal impact on coastal zone resources and that the outdoor RDT&E activities are consistent to the maximum extent practicable with the enforceable policies of Maryland's and Virginia's coastal zone management programs. The FCCD and Draft EIS were sent 17 August 2012 to the Wetlands and Waterways Program at the Maryland Department of the Environment (MDE) and the Office of Environmental Impact Review of the VDEQ. VDEQ concurred on 18 October 2012 that the outdoor RDT&E activities will be consistent with the Virginia Coastal Zone Management Program. MDE did not respond within 60 days to the Navy's consistency determination nor ask for an extension. Therefore, under the provisions of the CZMA, the Navy may presume State agency concurrence with its consistency determination. The Maryland Department of Natural Resources provided CZM-related comments on the Draft EIS, which have been addressed in the Final EIS; however, the comments did not directly address consistency with the Federal coastal zone program.

NHPA: The Navy submitted a request for concurrence with its determination of no adverse effect on National Register-listed or eligible resources under Section 106 of the NHPA of 1966, as amended (16 U.S.C. 470f), and its implementing regulation, 36 CFR 800, to the Maryland Historic Trust (MHT) and the Virginia Department of Historic Resources (VDHR). The VDHR concurred on 05 June 2012 that there will be no adverse effect from the outdoor RDT&E

activities. The MHT concurred on 11 June 2012 that the outdoor RDT&E activities will have no direct or indirect adverse effect to archeological resources within the archeological area of potential effect (APE) and that there will be no adverse effect on National Register of Historic Places (NRHP) eligible or listed properties within the Maryland portion of the Historic Architectural APE. The Historic Architectural APE encompassed portions of King George, Westmoreland, and Richmond counties in Virginia and Charles and St. Mary's counties in Maryland. Thirty-six resources listed in or eligible for listing in the NRHP were within the APE plus multiple historic districts on NSF Dahlgren recommended as eligible for listing. The Archaeological APE, which encompassed NSF Dahlgren, nearby land, and the PRTR MDZ, included one resource on an island in the PRTR eligible for listing plus two resources on NSF Dahlgren recommended as eligible for listing in the NRHP.

Responses to Comments Received on the Final EIS: The Navy reviewed and considered all comments that were received during the 31-day wait period following the issuance of the NOA of the Final EIS. The Navy received 13 letters or e-mails containing 42 distinct comments on the Final EIS, none of which raised new, substantive issues that had not already been addressed in the Draft EIS or Final EIS. USEPA Region 3 commented on the clarity of the Navy's tables for identifying environmental justice populations of concern and concentrations of children, but did not comment on the content or conclusions of the analysis. Maryland and Virginia state agencies noted that their comments on the Draft EIS had been addressed in the Final EIS and that there will be no adverse impacts. Charles and St. Mary's counties indicated that the outdoor RDT&E activities are consistent with their plans, programs, and objectives; St. Mary's County requested the Navy to be aware of plans for their county airport. Two members of the public who had commented on the Draft EIS restated their concerns about the effects of increased noise and vibration levels; however, as described in the Final EIS, noise and vibration levels will not increase.

Conclusion: On behalf of the Navy, and based on all relevant factors addressed in the Final EIS, and considering recommendations and comments provided by Federal, state, and local agencies and committees, non-governmental organizations, and the general public throughout the NEPA process, I have selected implementation of Alternative 2 for the outdoor RDT&E activities at NSF Dahlgren, VA. Alternative 2 will fully meet the Navy's purpose and need to support future outdoor RDT&E activities' needs and requirements. It supports an increased level of outdoor RDT&E activities in the foreseeable future, thus optimizing NSWCDD's activities on ranges and the Mission Area, without significant environmental impacts. Therefore, the Navy will implement the preferred alternative.

10/15/13

Date

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(Energy, Installations and Environment)