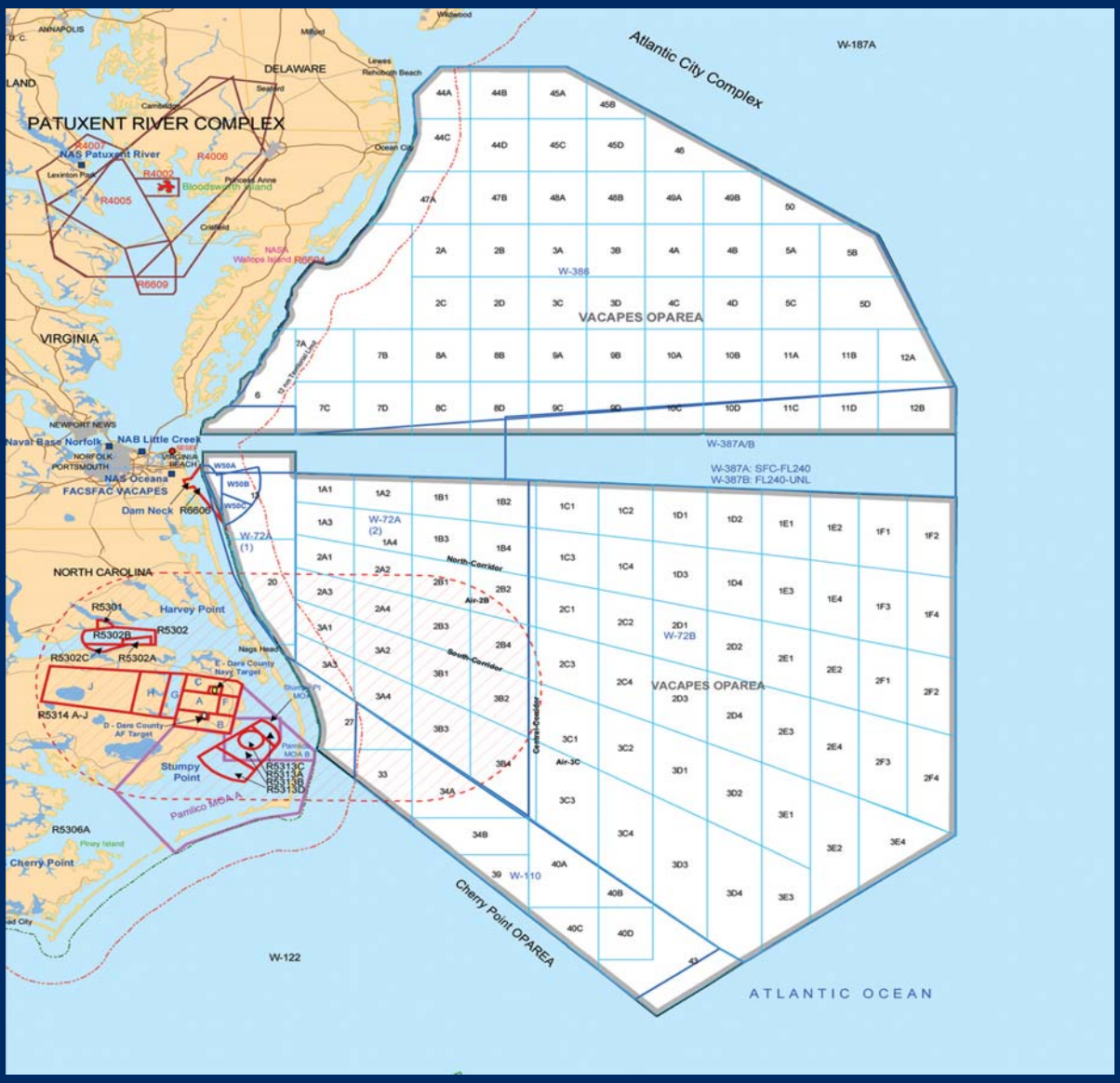
Virginia Capes Range Complex Final Environmental Impact Statement/ Overseas Environmental Impact Statement (EIS/OEIS) Volume 2, Appendices



Prepared by:

United States Fleet Forces

March 2009

VACAPES RANGE COMPLEX
FINAL ENVIRONMENTAL IMPACT STATEMENT/ OVERSEAS ENVIRONMENTAL IMPACT STATEMENT

Volume 2, Appendices

Lead Agency
Department of the Navy

Action Proponent:
United States Fleet Forces

For Additional Information:
NAVFAC Atlantic
6506 Hampton Boulevard, Norfolk, VA 23508-1278
Phone: (757) 322-4960

Cooperating Agency
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway, Silver Spring, Maryland 20910-3226

Published March 2009

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APPENDIX A

COOPERATING AGENCIES AND ACCEPTANCE LETTERS

This appendix contains the following letters:

1. CNO letter dated 21 February 2007 to NMFS requesting NMFS to be a cooperative agency on VACAPES EIS/OEIS
2. NMFS acceptance letter dated 12 March 2007

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DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO

5090
Ser N456C/7U158027
21 February 2007

Dr. William T. Hogarth
Assistant Administrator
National Oceanic and Atmospheric
Administration (NOAA) Fisheries
1315 East West Highway
Silver Springs, MD 20910

Dear Dr. Hogarth:

In accordance with the National Environmental Policy Act (NEPA), the Department of the Navy (Navy) is initiating the preparation of an Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) to evaluate potential environmental effects of using the Virginia Capes (VACAPES) Range Complex to support current, emerging, and future military activities as necessary to achieve and sustain Fleet readiness. The Proposed Action will further our statutory obligations under Title 10 of the United States Code governing the roles and responsibilities of the Navy.

In order to adequately evaluate the potential environmental effects of the Proposed Action, the Navy and National Marine Fisheries Service (NMFS) will need to work together on predominantly explosive acoustic effects to marine species protected under the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA). To assist in this effort, and in accordance with 40 CFR Part 1501 and the Council on Environmental Quality Cooperating Agency guidance issued on 30 January 2002, the Navy requests NMFS serve as a cooperating agency for the development of the EIS/OEIS.

The Proposed Action for the VACAPES Range Complex EIS/OEIS is to:

- Maintain current levels of military readiness by training.
- Accommodate future increases in operational training tempo and support the deployment of naval forces.
- Achieve and sustain readiness in ships and squadrons so that the Navy can quickly surge significant combat power in the event of a national crisis or contingency operations.
- Support the acquisition and implementation into the Fleet of advanced military technology. The VACAPES Range Complex

must adequately support the testing and training needed for new platforms and weapons systems.

- Implement investments to optimize range capabilities required to adequately support required training.

- Maintain the long-term viability of the Complex while protecting human health and the environment.

The No-Action Alternative is the continuation of training, testing, and supporting operations at baseline levels of activity.

The EIS/OEIS will address foreseeable activities in the particular geographical areas affected by the No-Action Alternative and action alternatives. This EIS/OEIS will include acoustic exposure modeling of predominantly explosive sources and an effects-analysis for marine mammals. The effects-analysis will be based upon validated Navy acoustic models and agreed upon Navy/NMFS criteria. In addition, other environmental resource areas that will be addressed as applicable in the EIS/OEIS include air quality; airspace; biological resources, including marine mammals and threatened and endangered species; cultural resources; geology and soils; hazardous materials and waste; health and safety; land use; noise; socioeconomics; transportation; utilities; visual and aesthetic resources; and water resources.

As the lead agency, the Navy will be responsible for overseeing preparation of the EIS/OEIS, which will include, but not be limited to the following:

- Gathering all necessary background information and preparing the EIS/OEIS and all necessary permit applications associated with predominantly explosive acoustic issues on the underwater ranges.

- Working with NMFS personnel to determine the method of estimating potential effects to protected marine species, including threatened and endangered species.

- Determining the scope of the EIS/OEIS, including the alternatives evaluated.

- Circulating the appropriate NEPA documentation to the general public and any other interested parties.

- Scheduling and supervising meetings held in support of the NEPA process, and compiling any comments received.

- Maintaining an administrative record and responding to any Freedom of Information Act requests relating to the EIS/OEIS.

Navy requests that NMFS, as cooperating agency, provide support as follows:

- Provide timely comments after the Agency Information Meeting (which will be held at the onset of the EIS/OEIS process) and on working drafts of the EIS/OEIS documents. The Navy requests that comments on draft EIS/OEIS documents be provided within 21 calendar days.

- Respond to Navy requests for information. Coordinating, to the maximum extent practicable, any public comment periods necessary in the MMPA permitting process with the Navy's NEPA public comment periods.

- Participate, as necessary, in meetings hosted by the Navy for discussion of EIS/OEIS related issues.

- Adhere to the overall project schedule agreed upon by the Navy and NMFS.

- Provide a formal, written response to this request.

My point of contact for this action is Ms. Karen M. Foskey, (703) 602-2859, email: karen.foskey@navy.mil.

Sincerely,

J.A. SYMONDS
Rear Admiral, U.S. Navy
Director, Environmental
Readiness Division

Copy to:
ASN (I&E)
DASN (E), (I&F)
OAGC (I&E)
FLTFORCOM, N4/7
FLTFORCOM, N77
Commander, Navy Region Mid-Atlantic

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910

THE DIRECTOR

MAR 12 2007

Admiral J.A. Symonds
Director, Environmental Readiness Division
Department of the Navy
2000 Navy Pentagon
Washington, DC 20350-2000

Dear Admiral Symonds:

Thank you for your letter requesting the National Marine Fisheries Service (NOAA Fisheries) be a cooperating agency in the preparation of an Environmental Impact Statement (EIS) to evaluate potential environmental effects of using the Virginia Capes (VACAPES) Range Complex to support current, emerging, and future military activities as necessary to achieve and sustain Fleet readiness. We support the Navy's decision to prepare an EIS on this activity and agree to be a cooperating agency, due, in part, to our responsibilities under section 101(a)(5)(A) of the Marine Mammal Protection Act (MMPA) and section 7 of the Endangered Species Act. We met with the Navy on February 7, 2007, and are currently working on a joint plan that will address how NOAA Fisheries and the Navy will cooperate during the development of multiple Navy EISs for Training Ranges and Major Exercises, including the VACAPES Range Complex. Until the joint plan is complete, NOAA Fisheries will make every effort to support the Navy in the specific ways described in the Navy's February 21, 2007, letter.

If you need any additional information, please contact Ms. Jolie Harrison, (301) 713-2289, ext. 166.

Sincerely,

for William T. Hogarth, Ph.D.

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

APPENDIX B

NOTICE OF INTENT AND NOTICE OF AVAILABILITY

This appendix contains the following:

1. Notice of Intent to Prepare an Environmental Impact Statement/Overseas Environmental Impact Statement for the Virginia Capes Range Complex and a Notice of Public Scoping Meetings (71 FR 236)
2. Revised Notice of Intent to Prepare an Environmental Impact Statement/Overseas Environmental Impact Statement for the Virginia Capes Range Complex and a Notice of Request for Public Comments (72 FR 171)
3. Notice of Public Hearing for the Virginia Capes Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (73 FR 125)

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condition of environmental resources in and around areas considered for development, and potential impacts on those resources as a result of implementing the alternatives. The alternatives considered in detail are: (1) Proposed Project/Proposed Action (i.e., Proposed Project Alternative), the Applicants' Preferred Alternative; (2) High Density (Increased Densities Consistent with Sacramento Area Council of Governments Blueprint); (3) Impact Minimization; (4) No Federal Action (No Section 404 of the Clean Water Act Permit); and (5) No Project/No Action (No development).

DATES: All written comments must be postmarked on or before February 5, 2007. A public hearing will be held on a date to be determined following the close of the comment period; notice of this hearing will be sent to all appropriate parties at a later date.

ADDRESSES: Comments may be submitted in writing to: Anna Sutton, U.S. Army Corps of Engineers, Sacramento District, Regulatory Branch, 1325 J Street, Room 1480, Sacramento, CA 95814–2922, or via e-mail to *Anna.M.Sutton@spk01.usace.army. mil.* Oral and written comments may also be submitted at the public hearing described in the **DATES** section.

FOR FURTHER INFORMATION CONTACT: Anna Sutton at (916) 557–7759 or via e-mail at *Anna.M.Sutton@spk01.usace.army.mil.*

SUPPLEMENTARY INFORMATION: Elliott Homes and GenCorp Realty Investments (GenCorp), the project applicant(s), are seeking adoption by the City of Rancho Cordova of the proposed Rio del Oro Specific Plan. Elliott Homes is seeking specific development entitlements (e.g., tentative subdivision maps); GenCorp is seeking overall development entitlements, but has not proposed specific development entitlements necessary for immediate or short-term development. Both Elliott Homes and GenCorp are also seeking authorization from USACE to place dredged or fill material into waters of the United States.

Five alternatives are evaluated in detail in the DEIS. Under the Proposed Project/Proposed Action (Proposed Project Alternative), buildout of the project would be split into five phases and is anticipated to occur over a 25- to 30-year period. The project provides for construction of approximately 11,601 residential dwelling units in three residential land use classifications on 1,920 acres, along with commercial land uses, neighborhood parks and other uses such as a landscape corridor and greenbelt, and several public schools. New utilities and communications infrastructure would be installed and new roadways and on- and off-site infrastructure improvements would be completed. The project designates a 507-acre wetland preserve area and two elderberry preserve areas on the project site. The four alternatives to the Proposed Project/Proposed Action are described briefly below.

(1) The High Density Alternative embraces the concept of ''Smart Growth,'' consistent with the Sacramento Area Council of Governments' Regional Blueprint Project. Under Smart Growth principles, areas planned for development are developed at higher densities. Although these higher densities may result in greater localized impacts on resources, the overall area of disturbance is reduced by concentrating development in particular locations. The total acreage of residential development would be the same under this alternative as under the Proposed Project/Proposed Action, but approximately 3,800 additional residential units would be constructed. The acreage of commercial and industrial development as well as the wetland preserve would be the same.

(2) The Impact Minimization Alternative would reconfigure project components to reduce impacts on waters of the United States, including wetlands and high-quality biological habitat. An additional 485 acres of the project site would be designated as part of the protected wetland preserve; as a result, approximately 25% of the project site would become a part of the wetland preserve. The total acreage of residential development would be reduced by approximately 470 acres and approximately 1,040 fewer residential units would be constructed, although overall density would increase because a greater proportion of residential acreage would be developed with medium and high density. Commercial and industrial development sites would be slightly reduced.

(3) The No Federal Action Alternative was designed to allow some development of the project site while avoiding the placement of dredged or fill material into waters of the United States. Under this alternative, 872 acres of the project site would be designated ''Natural Resources'' under the City of Rancho Cordova General Plan. Land with this use designation is set aside as natural habitat with no urban development; public access into this area would be prohibited. The types of land uses would remain the same as under the Proposed Project/Proposed Action.

(4) The No Project/No Action Alternative would preclude development of the project; under this alternative the majority of the project site would remain under the jurisdiction of the City of Rancho Cordova. This alternative assumes that aggregate mining operations to remove portions of existing dredge tailings at the project site would continue under existing Conditional Use Permits. Aggregate mining operations are not part of the Rio del Oro project.

USACE invites full public participation to promote open communication and better decision-making. All persons and organizations that have an interest in the Rio del Oro Specific Plan Project are urged to participate in the NEPA process. A public hearing will be held as described in the **DATES** section. This hearing will be announced in advance through notices, media news releases, and/or mailings.

Copies of the DEIS may be reviewed at the following locations:

1. U.S. Army Corps of Engineers, Sacramento District Web site: *http://www.spk.usace.army.mil/organizations/cespk-co/regulatory/index.html.*

2. City of Rancho Cordova City Hall, 2729 Prospect Park Drive, Rancho Cordova, CA 95670.

3. City of Rancho Cordova Planning Department Web site: *http://www.cityofranchocordova.org/city_departments/planning_main.html.*

Brenda S. Bowen,

Army Federal Register Liaison Officer.

[FR Doc. 06–9597 Filed 12–7–06; 8:45 am]

BILLING CODE 3710–EZ–M

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Intent To Prepare an Environmental Impact Statement/ Overseas Environmental Impact Statement for the Virginia Capes Range Complex and Notice of Public Scoping Meetings

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: Pursuant to Section (102)(2)(C) of the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality Regulations (40 CFR Parts 1500–1508), and Executive Order 12114, the Department of the Navy (DON) announces its intent to prepare an Environmental Impact Statement (EIS)/Overseas EIS (OEIS) to evaluate the potential environmental

consequences associated with naval training in the Virginia Capes (VACAPES) Range Complex. The DON proposes to support and conduct current and emerging training operations and research, development, testing, and evaluation (RDT&E) operations in the VACAPES Range Complex by: (1) Maintaining baseline operations at current levels; (2) increasing training operations from current levels as necessary to support the Fleet Readiness Training Plan; (3) accommodating mission requirements associated with force structure change; and (4) implementing enhanced range complex capabilities. The EIS/OEIS study area is the VACAPES Range Complex which consists of targets and instrumented areas, airspace, surface and subsurface operations areas (OPAREAs), and land range facilities. Together the VACAPES Range Complex encompasses: 15,143 acres of land area (including 13,600 acres of land area for ranges); 5,158 nm^2 of special use airspace (SUA) associated with land ranges; 27,661 nm^2 of offshore surface and subsurface OPAREA; 9,589 nm^2 of shallow ocean area less than 100 fathoms (600 feet); 18,072 nm^2 of deep ocean areas greater than 100 fathoms; 330 nm^2 of over water danger areas; and 28,672 nm^2 of SUA warning areas. The scope of actions to be analyzed in this EIS/OEIS includes current and proposed future Navy training and RDT&E operations within Navy-controlled operating areas, airspace, and ranges. It also includes proposed Navy-funded range capabilities enhancements, including infrastructure improvements, which support range complex training and RDT&E operations. Training activities that involve the use of active sonar are conducted in the VACAPES Range Complex; however, those potential effects are being analyzed in detail in a separate document, the Atlantic Fleet Active Sonar Training EIS/OEIS. This separate sonar EIS/OEIS addresses active sonar use as a whole by the Atlantic Fleet in the eastern Atlantic Ocean (including waters that are part of the VACAPES Range Complex), and in the Gulf of Mexico. The results of this sonar EIS/OEIS will be incorporated into the VACAPES Range Complex EIS/OEIS to account for active sonar effects that could occur within the geographic area of the VACAPES Range Complex. The DON will request the National Marine Fisheries Service to be a cooperating agency in the preparation of this EIS/OEIS.

Dates and Addresses: Public scoping meetings will be held at the following four sites to receive oral and written comments on environmental concerns that should be addressed in the EIS/OEIS: Salisbury, MD; Chincoteague Island, VA; Virginia Beach, VA; and Nags Head, NC. Public scoping open houses are scheduled below:

1. January 8, 2007, from 5 p.m. to 8 p.m. at James M. Bennett High School, 300 East College Avenue, Salisbury, MD 21804;

2. January 9, 2007 from 5 p.m. to 8 p.m. at the Chincoteague Community Center, 6155 Community Drive, Chincoteague Island, VA 23336;

3. January 10, 2007, from 5 p.m. to 8 p.m. at Lynnhaven Middle School, 1250 Bayne Drive, Virginia Beach, VA 23454; and

4. January 11, 2007 from 5 p.m. to 8 p.m. at the Comfort Inn Oceanfront South, 8031 Old Oregon Inlet Road, Nags Head, NC 27959.

FOR FURTHER INFORMATION CONTACT: Ms. Erin Swiader, Naval Facilities Engineering Command Atlantic, 6506 Hampton Boulevard, Norfolk, VA 23508–1278; telephone 757–322–4960; facsimile 757–322–4894.

SUPPLEMENTARY INFORMATION: Recent world events have placed the U.S. military on heightened alert in the defense of the U.S., and in defense of allied nations. At this time, the U.S. military, and specifically the U.S. Navy, is actively engaged in anti-terrorism efforts around the globe. The Navy's mission is to maintain, train, and equip combat-ready naval forces capable of winning wars, deterring aggression, and maintaining freedom of the seas. For that reason, 10 U.S.C. § 5062 directs the Chief of Naval Operations to train all naval forces for combat. Therefore, naval forces must have access to ranges, OPAREAs and airspace where they can develop and maintain skills for wartime missions and conduct RDT&E of naval weapons systems. As such, Navy ranges, OPAREAs, and airspace must be maintained and/or enhanced to accommodate necessary training and testing activities in support of national security objectives.

The purpose of the proposed action is to: Achieve and maintain Fleet readiness using the VACAPES Range Complex to support and conduct current, emerging, and future training operations, and RDT&E operations; expand warfare missions; and upgrade/modernize existing range capabilities to enhance and sustain Navy and Marine Corps training and testing.

The need for the proposed action is to provide combat capable forces ready to deploy worldwide in accordance with 10 U.S.C. § 5062. Specifically, maintain current levels of military readiness by training in the VACAPES Range Complex; accommodate future increases in operational training tempo in the VACAPES Range Complex and support the rapid deployment of naval units or strike groups; achieve and sustain readiness in ships and squadrons so that the DON can quickly surge significant combat power in the event of a national crisis or contingency operation and consistent with FRTP; support the testing and training needed for new platforms and weapons systems; and maintain the long-term viability of the VACAPES Range Complex while protecting human health and the environment, and enhancing the quality and communication capability and safety of the VACAPES Range Complex.

Three alternatives will be evaluated in the EIS/OEIS including:

(1) The No Action Alternative comprised of baseline operations and support of existing range capabilities;

(2) Alternative 1 comprised of the No Action Alternative plus additional operations and/or expanded warfare missions on upgraded, modernized, or existing ranges; and

(3) Alternative 1 plus a construction and operation of an instrumented minefield training area.

The EIS/OEIS will evaluate the environmental effects associated with: Airspace; noise; range safety; natural land resources; water resources; air quality; biological resources, including threatened and endangered species; land use; socioeconomic resources; infrastructure; and cultural resources. The analysis will include an evaluation of direct and indirect impacts, and will account for cumulative impacts from other DON activities in the VACAPES Range Complex. No decision will be made to implement any alternative until the EIS/OEIS process is completed and a Record of Decision is signed by the Assistant Secretary of the Navy (Installations and Environment).

The DON is initiating the scoping process to identify community concerns and local issues to be addressed in the EIS/OEIS. Federal agencies, state agencies, local agencies, and interested persons are encouraged to provide oral and/or written comments to the DON to identify specific issues or topics of environmental concern that should be addressed in the EIS/OEIS. Written comments must be postmarked by January 23, 2007, and should be mailed to: Naval Facilities Engineering Command, Atlantic, 6506 Hampton Boulevard, Norfolk, VA 23508–1278, Attention: Code EV21JS (Ms. Erin Swiader), telephone 757–322–4960, facsimile 757–322–4894.

Dated: December 4, 2006.

M.A. Harvison,

Lieutenant Commander, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. E6–20846 Filed 12–7–06; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF EDUCATION

Submission for OMB Review; Comment Request

AGENCY: Department of Education.

SUMMARY: The Acting Leader, Information Policy and Standards Team, Regulatory Information Management Services, Office of Management invites comments on the submission for OMB review as required by the Paperwork Reduction Act of 1995.

DATES: Interested persons are invited to submit comments on or before January 8, 2007.

ADDRESSES: Written comments should be addressed to the Office of Information and Regulatory Affairs, Attention: Rachel Potter, Desk Officer, Department of Education, Office of Management and Budget, 725 17th Street, NW., Room 10222, New Executive Office Building, Washington, DC 20503 or faxed to (202) 395–6974.

SUPPLEMENTARY INFORMATION: Section 3506 of the Paperwork Reduction Act of 1995 (44 U.S.C. Chapter 35) requires that the Office of Management and Budget (OMB) provide interested Federal agencies and the public an early opportunity to comment on information collection requests. OMB may amend or waive the requirement for public consultation to the extent that public participation in the approval process would defeat the purpose of the information collection, violate State or Federal law, or substantially interfere with any agency's ability to perform its statutory obligations. The Acting Leader, Information Policy and Standards Team, Regulatory Information Management Services, Office of Management, publishes that notice containing proposed information collection requests prior to submission of these requests to OMB. Each proposed information collection, grouped by office, contains the following: (1) Type of review requested, e.g., new, revision, extension, existing or reinstatement; (2) Title; (3) Summary of the collection; (4) Description of the need for, and proposed use of, the information; (5) Respondents and frequency of collection; and (6) Reporting and/or Recordkeeping burden. OMB invites public comment.

Dated: December 4, 2006.

Dianne M. Novick,

Acting Leader, Information Policy and Standards Team, Regulatory Information Management Services Office of Management.

Institute of Education Sciences

Type of Review: Revision.

Title: Schools and Staffing Survey 2007.

Frequency: Other: one-time.

Affected Public: State, Local, or Tribal Gov't, SEAs or LEAs; Businesses or other for-profit; Not-for-profit institutions.

Reporting and Recordkeeping Hour Burden:

Responses: 124,906.

Burden Hours: 70,775.

Abstract: The Schools and Staffing Survey is a nationally and state representative survey of teachers, principals, schools and school districts. Respondents include public and private school principals, teachers and school and LEA staff persons. Topics covered include characteristics of teachers, principals, schools, school libraries, teacher training opportunities, retention, retirement, hiring, and shortages.

Requests for copies of the information collection submission for OMB review may be accessed from *http://edicsweb.ed.gov*, by selecting the ''Browse Pending Collections'' link and by clicking on link number 3191. When you access the information collection, click on ''Download Attachments '' to view. Written requests for information should be addressed to U.S. Department of Education, 400 Maryland Avenue, SW., Potomac Center, 9th Floor, Washington, DC 20202–4700. Requests may also be electronically mailed to *ICDocketMgr@ed.gov* or faxed to 202–245–6623. Please specify the complete title of the information collection when making your request.

Comments regarding burden and/or the collection activity requirements should be electronically mailed to *ICDocketMgr@ed.gov.* Individuals who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 1–800–877–8339.

[FR Doc. E6–20887 Filed 12–7–06; 8:45 am]

BILLING CODE 4000–01–P

DEPARTMENT OF EDUCATION

Notice of Proposed Information Collection Requests

AGENCY: Department of Education.

SUMMARY: The Acting Leader, Information Policy and Standards Team, Regulatory Information Management Services, Office of Management, invites comments on the proposed information collection requests as required by the Paperwork Reduction Act of 1995.

DATES: Interested persons are invited to submit comments on or before February 6, 2007.

SUPPLEMENTARY INFORMATION: Section 3506 of the Paperwork Reduction Act of 1995 (44 U.S.C. Chapter 35) requires that the Office of Management and Budget (OMB) provide interested Federal agencies and the public an early opportunity to comment on information collection requests. OMB may amend or waive the requirement for public consultation to the extent that public participation in the approval process would defeat the purpose of the information collection, violate State or Federal law, or substantially interfere with any agency's ability to perform its statutory obligations. The Acting Leader, Information Policy and Standards Team, Regulatory Information Management Services, Office of Management, publishes that notice containing proposed information collection requests prior to submission of these requests to OMB. Each proposed information collection, grouped by office, contains the following: (1) Type of review requested, e.g., new, revision, extension, existing or reinstatement; (2) Title; (3) Summary of the collection; (4) Description of the need for, and proposed use of, the information; (5) Respondents and frequency of collection; and (6) Reporting and/or Recordkeeping burden. OMB invites public comment.

The Department of Education is especially interested in public comment addressing the following issues: (1) Is this collection necessary to the proper functions of the Department; (2) will this information be processed and used in a timely manner; (3) is the estimate of burden accurate; (4) how might the Department enhance the quality, utility, and clarity of the information to be collected; and (5) how might the Department minimize the burden of this collection on the respondents, including through the use of information technology.

Dated: December 4, 2006.

Dianne M. Novick,

Acting Leader, Information Policy and Standards Team, Regulatory Information Management Services, Office of Management.

Office of Special Education and Rehabilitative Services

Type of Review: Reinstatement.

Reserve in important related programs, such as volunteerism and outreach to communities to encourage stewardship of coastal resources in southern Maine.

The Wells Reserve is a public/private partnership whose administrative oversight is vested in the Reserve Management Authority (RMA). This independent state agency was established in 1990 to support and promote the interests of the Wells Reserve. The RMA has a Board of Directors composed of representatives having a property, management, or program interest in the Wells Reserve. The RMA members represent the Maine Department of conservation, the U.S. Fish and Wildlife Service, the Town of Wells, the Laudholm Trust, the Maine State Planning Office, and the National Oceanic and Atmospheric Administration.

FOR FURTHER INFORMATION CONTACT: Doris Grimm at (301) 563–7107 or Laurie McGilvray at (301) 563–1158 of NOAA's National Ocean Service, Estuarine Reserves Division, 1305 East-West Highway, N/ORM5, 10th floor, Silver Spring, MD 20910.

Dated: August 27, 2007.

David M. Kennedy,

Director, Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.

[FR Doc. E7–17482 Filed 9–4–07; 8:45 am]

BILLING CODE 3510–08–P

DEPARTMENT OF DEFENSE

Office of the Secretary

Defense Advisory Committee on Military Personnel Testing

AGENCY: Under Secretary of Defense for Personnel and Readiness, DoD.

ACTION: Notice.

SUMMARY: Pursuant to Public Law 92–463, notice is hereby given that a meeting of the Defense Advisory Committee on Military Personnel Testing is scheduled to be held. The purpose of the meeting is to review planned changes and progress in developing computerized and paper-and-pencil enlistment tests.

DATES: September 20, 2007, from 8 a.m. to 4 p.m., and September 21, from 8 a.m. to 4 p.m.

ADDRESSES: The meeting will be held at the Sheraton Ferncroft Resort, 50 Ferncroft Road, Danvers, Massachusetts 01923.

FOR FURTHER INFORMATION CONTACT: Dr. Jane M. Arabian, Assistant Director, Accession Policy, Officer of the Under Secretary of Defense (Personnel and Readiness), Room 2B271, The Pentagon, Washington, DC 20301–4000, telephone (703) 697–9271.

SUPPLEMENTARY INFORMATION: Persons desiring to make oral presentations or submit written statements for consideration at the Committee meeting must contact Dr. Jane M. Arabian at the address or telephone number above no later than September 10, 2007.

Dated: August 29, 2007.

L.M. Bynum,

Federal Register Liaison Officer, Department of Defense.

[FR Doc. 07–4314 Filed 9–4–07; 8:45 am]

BILLING CODE 5001–06–M

DEPARTMENT OF DEFENSE

Department of the Air Force

Air Force Special Operations Command Assets Beddown, Cannon Air Force Base, NM

AGENCY: Department of the Air Force, DOD.

ACTION: Record of Decision.

SUMMARY: On August 20, 2007, the United States Air Force signed the Record of Decision (ROD) for the Air Force Special Operations Command Assets Beddown at Cannon Air Force Base (AFB), New Mexico. The ROD states the Air Force decision to implement the Preferred Alternative (East West Airfield Alternative at Cannon AFB, the Two Target Alternative at Melrose Air Force Range, and the use of Cannon scheduled airspace).

The decision was based on matters discussed in the Final Environmental Impact Statement (EIS), inputs from the public and regulatory agencies, and other relevant factors. The Final EIS was made available on July 20, 2007 in the **Federal Register** (Volume 72, Number 139, Page 39808) with a wait period ending August 20, 2007. The ROD documents only the decision of the Air Force with respect to the proposed Air Force actions analyzed in the Final EIS.

FOR FURTHER INFORMATION CONTACT: Mr. Carl T. Hoffman, Headquarters Air Force Special Operations Command/A7PP, Hurlburt Field, FL, 32544–5434 or call (850) 884–5984.

Bao-Anh Trinh,

Air Force Federal Register Liaison Officer.

[FR Doc. E7–17515 Filed 9–4–07; 8:45 am]

BILLING CODE 5001–05–P

DEPARTMENT OF DEFENSE

Department of the Navy

Revised Notice of Intent To Prepare an Environmental Impact Statement/ Overseas Environmental Impact Statement for the Virginia Capes Range Complex and Notice of Request for Public Scoping Comments

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: This notice is to inform the public that the Department of the Navy is expanding the Virginia Capes (VACAPES) Range Complex Environmental Impact Statement/ Overseas Environmental Impact Statement (EIS/OEIS) area of consideration and to invite the public to provide comments for consideration during preparation of the EIS/OEIS. Since the December 2006 EIS/OEIS scoping notice [FR 71143], potential shallow water inert mine warfare training areas have been identified in the southern portion of the Chesapeake Bay, south of latitude 37° 25′N. The proposed training areas would consist of instrumented shapes placed temporarily for training purposes. Each of the two proposed training areas would be approximately one by four square nautical miles in area. Training in these mine warfare areas would not involve use of active sonar. Arrangement could vary periodically and location within the proposed training areas would vary depending on operational requirements; however shipping lanes will be avoided. Divers will be required to perform periodic maintenance and replacement of the instrumented shapes.

Scoping comments previously submitted following publication of the December 2006 Notice of Intent to Prepare an EIS/OEIS for the VACAPES Range Complex are still valid and need not be resubmitted. The Navy encourages additional comments or concerns on the expanded area of consideration. VACAPES Range Complex requirements, additional EIS/OEIS information, proposed action background, alternatives, environmental considerations, and public participation inputs can be found at *http://www.vacapesrangecomplexeis.com.* More detailed information regarding this notice of intent can be found on the project Web site.

FOR FURTHER INFORMATION CONTACT: Ms. Erin Swiader, Naval Facilities Engineering Command Atlantic, 6506 Hampton Boulevard, Norfolk, Virginia 23508–1278; telephone: 757–322–4960. You may submit written comments to

Naval Facilities Engineering Command Atlantic, 6506 Hampton Boulevard, Norfolk, Virginia 23508–1278, Attn: Code EV22 (VACAPES Range Complex EIS PM), facsimile: 757–322–4894. Comments will be accepted via mail, fax, and on the Web site at *http://www.vacapesrangecomplexeis.com* until September 30, 2007.

Dated: August 30, 2007.

T.M. Cruz,

Lieutenant, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. E7–17521 Filed 9–4–07; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF DEFENSE

Department of the Navy

Meetings of the Naval Research Advisory Committee

AGENCY: Department of the Navy, DoD.

ACTION: Notice of Closed Meetings.

SUMMARY: The Naval Research Advisory Committee (NRAC) will meet to discuss classified information from government organizations and proprietary information from commercial organizations. All sessions of the September 26 Plenary Session will be devoted to briefings and discussions focusing on emerging threats posed by potential adversaries, the exploitation of physical vulnerabilities and the tactical applications of known and emerging technologies. These sessions will also include proprietary information regarding technology applications and systems under development in the private sector between competing companies. In addition, these sessions will focus on the assessment of the emerging concepts of operations in each of these areas and evaluate appropriate options in such areas as: Training, S&T funding allocation, technology monitoring, and progress assessments; and probable time frames for transformation and implementation. Furthermore, these sessions will identify, review, and assess challenges with the utilization and fielding of various technology applications. All sessions on September 27 will be open to the public except for the meeting period from 4 p.m. to 5 p.m. dealing with the security and counterintelligence briefing which will involve discussions of security policies and procedures classified at the SECRET level.

DATES: The Fall Meetings will be held on Wednesday, September 26, and Thursday, September 27. The sessions open to the public will be on Thursday morning, September 27 at the Pentagon auditorium from 8:30 a.m. to 12 p.m. and on Thursday afternoon from 1:30 p.m. to 4 p.m. The security and counterintelligence briefing on the afternoon of September 27 from 4 p.m. to 5 p.m. and all sessions of September 26 will be closed to the public.

ADDRESSES: The meetings will be held at the Pentagon auditorium and the Headquarters, Office of Naval Research, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: Mr. William H. Ellis, Jr., Program Director, Naval Research Advisory Committee, 875 North Randolph Street, Arlington, VA 22203–1995, 703–696–5775.

SUPPLEMENTARY INFORMATION: This notice is provided in accordance with the provisions of the Federal Advisory Committee Act (5 U.S.C. App. 2). All sessions of the first day of the meeting will be devoted to executive sessions that will include discussions and technical examination of information related to the application of research and development to current and projected Navy and Marine Corps issues. Briefings classified at the SECRET level from the Assistant Secretary of the Navy (Research, Development and Acquisition) and high level Navy and Marine Corps officers are scheduled to provide candid assessments of threats, countermeasures and current and projected issues. All sessions of the second day of the meeting will be open to the public, with the exception of one session from 4 p.m. to 5 p.m. devoted to a security and counterintelligence briefing for new members of the committee. This security and counterintelligence briefing has been developed in its entirety for new members of the NRAC, and will outline security policies and procedures as they apply to the NRAC member.

These briefings and discussions will contain proprietary information and information classified at the SECRET level that is specifically authorized under criteria established by Executive Order to be kept SECRET in the interest of national defense and is in fact properly classified pursuant to such Executive Order. The proprietary, classified and non-classified matters to be discussed are so inextricably intertwined as to preclude opening these sessions of the meeting. In accordance with 5 U.S.C. App. 2, section 10(d), the Secretary of the Navy has determined in writing that the public interest requires that these sessions of the meetings be closed to the public because they will be concerned with matters listed in 5 U.S.C. section 552b(c)(1) and (4).

Dated: August 29, 2007.

T.M. Cruz,

Lieutenant, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. E7–17508 Filed 9–4–07; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Intent To Grant Exclusive Patent License to Annapolis Remote Acquisitions, LLC

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: The Department of the Navy hereby gives notice of its intent to grant to Annapolis Remote Acquisitions, LLC, a revocable, non-assignable, partially exclusive license to practice throughout the United States the Government-owned inventions described in U.S. Patent No. 6,717,525, TACTICAL VECTORING EQUIPMENT; U.S. Patent No. 6,820,025, METHOD AND APPARATUS FOR MOTION TRACKING OF AN ARTICULATED RIGID BODY; U.S. Patent No. 6,980,168, ULTRA-WIDEBAND ANTENNA WITH WAVE DRIVER AND BEAM SHAPER; U.S. Patent No. 7,089,148, METHOD AND APPRATUS FOR MOTION TRACKING OF AN ARTICULATED RIGID BODY; and U.S. Patent No. 7,154,431, SIGNAL SYNTHESIZER AND METHOD THEREFOR.

DATES: Anyone wishing to object to the grant of this license has fifteen (15) days from the date of this notice to file written objections along with supporting evidence, if any.

ADDRESSES: Written objections are to be filed with the President, Naval Postgraduate School; Office of Counsel, Code 00C, 1 University Circle, Room 131, Monterey, CA 93943.

FOR FURTHER INFORMATION CONTACT: Danielle Kuska, Director, Research and Sponsored Programs Office, Office of the Associate Provost and Dean of Research; Halligan Hall, Room 222; Naval Postgraduate School; Monterey, CA 93943–5138; telephone: 831–656–2209 or e-mail: *dkuska@nps.edu.*

(Authority: 35 U.S.C. 207, 37 CFR Part 404)

Dated: August 29, 2007.

T.M. Cruz,

Lieutenant, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. E7–17510 Filed 9–4–07; 8:45 am]

BILLING CODE 3810–FF–P

Atlantic Division; Attention: Code EV22CM (JAX EIS/OEIS PM); 6506 Hampton Blvd.; Norfolk, VA 23508–1278. Facsimile: 757–322–4894. Federal, State, and local agencies and interested parties are invited to be present or represented at the public hearing. Written comments can also be submitted during the open house sessions preceding the public hearings.

Oral statements will be heard and transcribed by a stenographer; however, to ensure the accuracy of the record, all statements should be submitted in writing. All statements, both oral and written, will become part of the public record on the Draft EIS/OEIS and will be responded to in the Final EIS/OEIS. Equal weight will be given to both oral and written statements. In the interest of available time, and to ensure all who wish to give an oral statement have the opportunity to do so, each speaker's comments will be limited to three (3) minutes. If a long statement is to be presented, it should be summarized at the public hearing with the full text submitted either in writing at the hearing, or mailed or faxed to Naval Facilities Engineering Command, Atlantic Division; Attention: Code EV22CM (JAX EIS/OEIS PM); 6506 Hampton Blvd.; Norfolk, VA 23508–1278. Facsimile: 757–322–4894. In addition, comments may be submitted on-line at *http://www.jacksonvillerangecomplexeis.com* during the comment period. All written comments must be postmarked by August 11, 2008 to ensure they become part of the official record. All comments will be addressed in the Final EIS/OEIS.

Dated: June 23, 2008.

T.M. Cruz,

Lieutenant, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. E8–14541 Filed 6–26–08; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Public Hearings for the Virginia Capes Range Complex Draft Environmental Impact Statement/ Overseas Environmental Impact Statement

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: Pursuant to section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] 4321); the Council of Environmental Quality (CEQ) Regulations for implementing the procedural provisions of NEPA (Title 40 Code of Federal Regulations [CFR] 1500–1508); Department of the Navy Procedures for Implementing NEPA (32 CFR 775); Executive Order (EO) 12114, Environmental Effects Abroad of Major Federal Actions; and Department of Defense (DoD) regulations implementing EO 12114 (32 CFR 187) the Department of the Navy (Navy) has prepared and filed with the U.S. Environmental Protection Agency a Draft Environmental Impact Statement/ Overseas Environmental Impact Statement (EIS/OEIS) on June 16, 2008. The National Marine Fisheries Service (NMFS) is a Cooperating Agency for the EIS/OEIS.

The EIS/OEIS evaluates the potential environmental impacts over a 10-year planning horizon associated with Navy Atlantic Fleet training; research, development, testing, and evaluation (RDT&E) activities; and associated range capabilities enhancements (including infrastructure improvements) within the existing Virginia Capes (VACAPES) Range Complex Operating Area (OPAREA). The components of the VACAPES Range Complex include 28,672 square nautical miles (nm^2) of special use area (SUA) warning area; 27,661 nm^2 of offshore surface and subsurface OPAREA; and 18,092 nm^2 of deep ocean area greater than 100 fathoms (600 feet).

The geographic scope of the EIS/OEIS includes the airspace, seaspace, and undersea space of the VACAPES Range Complex. This area is referred to as the VACAPES Study Area. The VACAPES Study Area does not include any dry land. However, it does include the area from the mean high tide line east (seaward) to the 3nm boundary of the states of Delaware, Maryland, Virginia, and North Carolina. This 3-nm state boundary also serves as the western boundary of the VACAPES OPAREA. The VACAPES Study Area also includes 420 nm^2 of the lower Chesapeake Bay. A Notice of Intent (NOI) for the EIS/OEIS was published in the **Federal Register** on December 8, 2006 (**Federal Register** Volume 71, No. 236, pp 71143–71145). A revised NOI was issued in the **Federal Register** (Volume 72, No. 171, pp 50940–50941) on September 5, 2007 when training areas in the southern Chesapeake Bay were identified for analysis.

The Navy will conduct four public hearings to receive oral and written comments on the Draft EIS/OEIS. Federal agencies, state agencies, and local agencies and interested individuals are invited to be present or represented at the public hearings. This notice announces the dates and locations of the public hearings for this Draft EIS/OEIS.

An open house session will precede the scheduled public hearing at each of the locations listed below and will allow individuals to review the information presented in the VACAPES Range Complex Draft EIS/OEIS. Navy representatives will be available during the open house sessions to clarify information related to the Draft EIS/OEIS.

DATES AND ADDRESSES: All meetings will start with an open house session from 5 p.m. to 7 p.m. A formal presentation and public comment period will be held from 7 p.m. to 9 p.m. Public hearings will be held on the following dates and at the following locations: July 14, 2008 at the Princess Royale Oceanfront Hotel, 9100 Coastal Hwy., Ocean City, MD; July 15, 2008 at the Chincoteague Center, 6155 Community Dr., Chincoteague, VA; July 16, 2008 at the Virginia Beach Resort & Conference Ctr., 2800 Shore Dr., Virginia Beach, VA; and July 17, 2008 at the Hilton Garden Inn, 5353 N. Va. Dare Trail, Kitty Hawk, NC.

FOR FURTHER INFORMATION CONTACT: Naval Facilities Engineering Command, Atlantic, Attention, EV22ES (VACAPES EIS/OEIS PM), 6506 Hampton Boulevard, Norfolk, Virginia 23508–1278; facsimile: 757–322–4894 or *http://www.vacapesrangecomplexeis.com.*

SUPPLEMENTARY INFORMATION: The Navy has identified the need to support and conduct current and emerging training and RDT&E operations in the VACAPES Range Complex. The proposed action does not indicate major changes to VACAPES Range Complex facilities, operations, training, or RDT&E capacities over the 10-year planning period. Rather, the proposed action would result in relatively small-scale but critical enhancements to the VACAPES Range Complex that are necessary if the Navy is to maintain a state of military readiness commensurate with its national defense mission.

The EIS/OEIS addresses the training strategies described in the Fleet Readiness Training Plan (FRTP) that implement the Fleet Response Plan, which ensures continuous availability of agile, flexible, trained, and ready surge-capable (rapid response) forces. The recommended range enhancements that have the potential to impact the environment, as well as current and future training and testing operations that have the potential to impact the environment, are the primary focus of the EIS/OEIS.

The purpose for the proposed action is to:

• Achieve and maintain Fleet readiness using the VACAPES Range Complex to support and conduct current, emerging, and future training operations and RDT&E operations;

• Expand warfare missions supported by the VACAPES Range Complex; and

• Upgrade and modernize existing range capabilities to enhance and sustain Navy training and RDT&E.

The need for the proposed action is to provide range capabilities for training and equipping combat-capable naval forces ready to deploy worldwide. In this regard, the VACAPES Range Complex furthers the Navy's execution of its congressionally mandated roles and responsibilities under Title 10 U.S.C. 5062. To implement this Congressional mandate, the Navy needs to:

• Maintain current levels of military readiness by training in the VACAPES Range Complex;

• Accommodate future increases in operational training tempo in the VACAPES Range Complex and support the rapid deployment of naval units or strike groups;

• Achieve and sustain readiness of ships and squadrons so the Navy can quickly surge significant combat power in the event of a national crisis or contingency operation, and consistent with the FRTP;

• Support the acquisition and implementation into the Fleet of advanced military technology. The VACAPES Range Complex must adequately support the testing and training needed for new platforms (aircraft and weapons systems); and

• Maintain the long-term viability of the VACAPES Range Complex while protecting human health and the environment, and enhancing the quality and communication capability and safety of the range complex.

Support to current, emerging, and future training and RDT&E operations, including implementation of range enhancements, entails the actions evaluated in the EIS/OEIS. These potentially include:

• Increase use of contractor-operated small aircraft that simulate enemy aircraft during training (Commercial Air Services Support for Fleet Opposition Forces and Electronic Warfare Threat Training);

• Increase anti-piracy and maritime interdiction training (Anti-terrorism Surface Strike Group Training);

• Support MH–60R/S helicopter warfare mission areas, and Multi-Mission Maritime Aircraft training operations; and

• Conduct mine warfare training using a temporary mine training area.

The proposed action is to support and conduct current and emerging training and RDT&E operations in the VACAPES Range Complex. To achieve this, the Navy proposes to:

• Maintain training and RDT&E operations at current levels if the No Action Alternative is selected.

If either Alternative 1 or Alternative 2 is selected, then:

• Increase or modify training and RDT&E operations from current levels as necessary in support of the FRTP.

• Accommodate mission requirements associated with force structure changes, including those resulting from the introduction of new platforms (aircraft, and weapons systems).

• Implement enhanced range complex capabilities.

The decision to be made by the Assistant Secretary of the Navy (Installations & Environment) is to determine which alternative analyzed in the EIS/OEIS satisfies both the level and mix of training to be conducted and the range capabilities enhancements to be made within the VACAPES Range Complex that best meet the needs of the Navy given that all reasonably foreseeable environmental impacts have been considered.

Three alternatives were evaluated in the EIS/OEIS to ensure they met the purpose and need, giving due consideration to range complex attributes such as: the capability to support current and emerging Fleet tactical training and RDT&E requirements; the capability to support realistic, essential training at the level and frequency sufficient to support the FRTP; and the capability to support training requirements while following Navy Personnel Tempo of Operations guidelines. These alternatives include:

1. The No Action Alternative—Current Operations to include surge consistent with the FRTP;

2. Alternative 1—No Action Alternative plus: increase Operational Training, Expand Warfare Missions, Accommodate Force Structure Changes (includes changing weapon systems and platforms and homebasing new aircraft and ships), and implement enhancements, to the minimal extent possible to meet the components of the proposed action. This alternative is composed of all operations currently conducted (No Action Alternative) with modifications to current training or introduction of new training. These would include: (a) Using more commercial aircraft to serve as oppositional forces rather than using Navy aircraft for Air-to-Air Missile Exercise, Surface-to-Air Gunnery Exercises, Air Intercept Control Exercises, and Detect-to-Engage Exercises; (b) the incorporation of anti-terrorism training into existing training events; (c) adjusting training levels to ensure that deployment can be stepped up quickly and at multiple locations in response to world events; and (d) conducting new or modified training associated with the introduction of the new MH–60 helicopter, and new organic mine countermeasure systems; and

3. Alternative 2 (Preferred Alternative)—Alternative 1 plus: enhanced mine warfare training capabilities, a reduction of live bombing exercises, and implementation of additional enhancements to enable the range complex to meet future requirements.

Three alternatives were considered but eliminated from further consideration. These include:

1. Alternative Range Complex Locations—No single range complex on the East Coast can accommodate the entire spectrum of Navy and Marine Corps training and testing. To maintain a high level of combat readiness for naval forces at best value to the U.S. taxpayer, the Navy and Marine Corps homeported their forces in multiple concentration areas rather than a single area, in part to ensure the surrounding training and testing areas could support their specific needs. The result is a system of range complexes, each optimized to support the limited set of warfare areas that predominate in that locale. The VACAPES Range Complex possesses a number of historical and natural features that make it an indispensable component of the Navy's East Coast system of ranges. The VACAPES Range Complex is a vital component of the Atlantic Fleet system of range complexes, necessary and critical to ensure that naval forces are prepared and certified ready for overseas deployment and combat operations. Other locations do not provide reasonable alternatives for required training purposes/activities described above, and as a result, alternative training locations were eliminated from further consideration.

2. Conduct Simulated Training Only—Under this alternative, only simulated training would be conducted using computer models and classroom training. While computer simulation and classroom training are currently used by the Navy and effective training tools, they cannot exclusively replace live training because they do not replicate the atmosphere or experience

that live training provides. Simulation cannot replicate the environment that is provided during coordinated training and major exercises, where multiple ships, submarines and aircraft, and hundreds or thousands of men and women are participating in training activities in a coordinated fashion to accomplish a common military objective. Because of the need to train as we fight, this alternative would fail to meet the purpose and need of the proposed action in that it would not sufficiently prepare our naval forces for combat. Therefore, this alternative is not evaluated in the EIS/OEIS.

3. Practice Ammunition Use—An alternative that would rely entirely on inert, practice ammunition use within the VACAPES Range Complex would not achieve the necessary levels of proficiency in firing weapons in a high stress and realistic environment. Inert, practice ammunition is utilized throughout the VACAPES Range Complex, and provides opportunity to implement a successful, integrated training program while reducing the risk and expense typically associated with live ammunition. As such, practice ammunition is already utilized extensively to enhance combat performance in the Navy's training program. However, while it is an essential component of training, practice ammunition cannot be used exclusively to train safely in an inherently unsafe combat environment. Consequently, this alternative fails to meet the purpose and need of the proposed action. Therefore, this alternative was not carried forward for analysis.

Nineteen resources and issues were described and analyzed in the EIS/OEIS. These include but are not limited to water resources, air quality, marine communities, marine mammals, sea turtles, fish and essential fish habitat, seabirds and migratory birds, cultural resources, regional economy, and public health and safety. The Navy used subject matter experts, public and agency scoping comments, previous environmental analyses, previous agency consultations, laws, regulations, Executive Orders and resource-specific information in a screening process to identify aspects of the proposed action that could act as stressors to resources and issues evaluated in the EIS/OEIS.

The stressors considered for analysis of environmental consequences include but are not limited to vessel movements (disturbance and collisions), aircraft overflights (disturbance and strikes), non-explosive practice munitions, and underwater detonations and high explosive ordnance.

In accordance with 50 CFR 401.12 the Navy submitted a Biological Evaluation to assess the potential effects from the proposed action on marine resources and anadromous fish protected by the NMFS under the Endangered Species Act (ESA). In accordance with the Marine Mammal Protection Act MMPA (16 U.S.C. 1371[a][5]), the Navy submitted a request for Letter of Authorization to the NMFS for the incidental taking of marine mammals by the proposed action which was acknowledged by NMFS in a Notice of Receipt published in the **Federal Register** (Vol. 73, No. 72, pp 20032–20034) on April 14, 2008.

The Navy submitted a Consultation Package in accordance with legal requirements set forth under regulations implementing Section 7 of the ESA (50 CFR 402; 16 U.S.C 1536 (c)) for listed species under jurisdiction of the U.S. Fish and Wildlife Service. The analysis of environmental stressors indicated that implementation of the No Action Alternative, Alternative 1, or Alternative 2 would not result in unavoidable significant adverse effects to resources and issues analyzed.

The analysis of environmental stressors and alternatives indicated no significant impact to resources and issues in U.S. territorial waters; likewise, no significant harm in non-territorial waters would be expected. The VACAPES Draft EIS/OEIS was distributed to Federal, State, and local agencies, elected officials, and other interested individuals and organizations on June 27, 2008. The public comment period will end on August 11, 2008. Copies of the VACAPES Draft EIS/OEIS are available for public review at the following libraries: Ocean City Branch Library, 10003 Coastal Highway, Ocean City, MD; Rehoboth Beach Public Library, 226 Rehoboth Avenue Rehoboth Beach, DE; Wicomico Public Library, 122 South Division Street, Salisbury, MD; Island Library, 4077 Main Street, Chincoteague, VA; Central Library, 4100 Virginia Beach Blvd, Virginia Beach, VA; and Kill Devil Hills Branch Library, 400 S. Mustian St, Kill Devil Hills, NC.

The VACAPES Draft EIS/OEIS is also available for electronic public viewing at *http://www.vacapesrangecomplexeis.com.* A paper copy of the Executive Summary or a single CD with the VACAPES Draft EIS/OEIS will be made available upon written request by contacting Naval Facilities Engineering Command, Atlantic Division; Attention: Code EV22ES (VACAPES EIS/OEIS PM); 6506 Hampton Blvd; Norfolk, VA 23508–1278; facsimile: 757–322–4894. Federal, State, and local agencies and interested parties are invited to be present or represented at the public hearing. Written comments can also be submitted during the open house sessions preceding the public hearings. Oral statements will be heard and transcribed by a stenographer; however, to ensure the accuracy of the record, all statements should be submitted in writing. All statements, both oral and written, will become part of the public record on the Draft EIS/OEIS and will be responded to in the Final EIS/OEIS. Equal weight will be given to both oral and written statements.

In the interest of available time, and to ensure all who wish to give an oral statement have the opportunity to do so, each speaker's comments will be limited to three (3) minutes. If a long statement is to be presented, it should be summarized at the public hearing with the full text submitted either in writing at the hearing, or mailed or faxed to Naval Facilities Engineering Command, Atlantic Division; Attention: Code EV22ES (VACAPES EIS/OEIS PM); 6506 Hampton Blvd; Norfolk, VA 23508–1278; facsimile: 757–322–4894. In addition, comments may be submitted on-line at *http://www.vacapesrangecomplexeis.com* during the comment period. All written comments must be postmarked by August 11, 2008 to ensure they become part of the official record. All comments will be addressed in the Final EIS/OEIS.

Dated: June 18, 2008.

T.M. Cruz,

Lieutenant, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. E8–14539 Filed 6–26–08; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF ENERGY

Bonneville Power Administration

Willow Creek Wind Project

AGENCY: Bonneville Power Administration (BPA), Department of Energy (DOE).

ACTION: Notice of Availability of Record of Decision (ROD).

SUMMARY: The Bonneville Power Administration (BPA) has decided to offer contract terms for the electrical interconnection into the Federal Columbia River Transmission System (FCRTS) of up to 72 megawatts of power to be generated by the proposed Willow Creek Wind Project (Wind Project). Willow Creek Energy, LLC proposes to construct and operate the proposed Wind Project in Gilliam and Morrow

APPENDIX C

AGENCY CORRESPONDENCE

This appendix contains the following letters:

1. CNO letter to NMFS dated November 16, 2007, requesting the initiation of early consultation with NMFS under Section 7 of the Endangered Species Act
2. CNO letter dated 4 January 2008 to NMFS, transmitting the draft Biological Evaluation (BE)
3. OPNAV 45 letter dated 21 March 2008 to NMFS requesting a Letter of Authorization for Incidental Take of marine mammals
4. NAVFAC Atlantic letter dated May 12, 2008 to USFWS transmitting Endangered Species Act Section 7 Consultation package
5. US DoI Regional Environmental office letter dated August 28, 2008 acknowledging receipt of VACAPES Draft EIS/OEIS
6. CNO letter dated 15 September 2008 transmitting a replacement BE for NMFS consideration
7. US DoI Fish and Wildlife Service letter dated October 7, 2008 concurrence letter
8. NAVFAC Atlantic letter dated February 9, 2009 to Delaware State Historic Preservation Office
9. NAVFAC Atlantic letter dated February 9, 2009 to Maryland State Historic Preservation Office
10. NAVFAC Atlantic letter dated February 9, 2009 to Virginia State Historic Preservation Office
11. NAVFAC Atlantic letter dated February 9, 2009 to North Carolina State Historic Preservation Office
12. North Carolina Historic Preservation Office letter dated February 18, 2009 to NAVFAC Atlantic

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DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO

5090
Ser N456/7U158325
November 16, 2007

Mr. P. Michael Payne
Division Chief
Permits, Conservation, and Education Division
Office of Protected Resources
National Marine Fisheries Service (NMFS)
National Oceanic and Atmospheric Administration
B-SSMC3 Room 13821
1315 East-West Highway
Silver Spring, MD 20910-3282

Dear Mr. Payne,

The Commander, U. S. Fleet Forces Command (USFF) is preparing three Environmental Impact Statements /Overseas Environmental Impact Statements (EIS/OEIS) to assess the potential environmental impacts associated with sustainable range usage and enhancements within the Navy's East Coast range complexes for the Virginia Capes (VACAPES), Cherry Point, and Charleston/JAX operational areas (OPAREAS). Specifically, the proposed action is to support and conduct current and emerging training and Research, Development, Testing and Evaluation (RDT&E) activities in these three range complexes and to upgrade and modernize range complex capabilities to enhance and sustain Navy training and testing. A collection of actions will be evaluated within the EISs/OEISs. Specific descriptions of these alternatives are detailed in the Enclosures 1-3.

Conduct of these activities will likely result in acoustic exposure of marine mammals listed under the Marine Mammal Protection Act (MMPA) from impulsive sources and likely require a Letter of Authorization (LOA). As such, the Navy will be submitting a LOA request to your office in the coming months for these activities.

As an applicant for a MMPA permit, the Navy requests your office initiate early consultation procedures with the Endangered Species Division, in accordance with Section 7 (a) (3) of the ESA, and its implementing regulations at 50 CFR §402.11. In accordance with these regulations, the attached Preliminary Draft Descriptions of the Proposed Action and Alternatives

(DOPAA) for the EISs/OEISs serves as the Navy's proposal outlining the action. As previously stated, the effects of the proposed action for purposes of the MMPA permit will be from exposure to impulsive sources. The level of magnitude for these effects is still being modeled and will be included in the Navy's request for a LOA. A combined ESA Biological Evaluation for all three OPAREAS is proposed.

Title 10, Section 5062 of the United States Code requires the Navy to be "organized, trained and equipped primarily for prompt and sustained combat incident to operations at sea." The current and emerging RDT&E activities in these OPAREAs and proposed upgrades and modernization of these capabilities will be used to meet this legal requirement. Thus, in accordance with 50 CFR §402.11(b), this letter serves as the Navy's certification that it has a definite proposal and intends to implement the proposal should a MMPA authorization be obtained from your office.

In June 2004, the Navy submitted a request for Incidental Harassment Authorization and LOA to your office for the Integrated Maritime Portable Acoustic Scoring and Simulator System (IMPASS) (COMUSFF letter 5090 Ser N774B/038). Since this request Navy has continued to refine its use of this system, resulting in changes not reflected in our original submittal. These changes will be reflected in the three East Coast EISs/OEISs for which we will be submitting an MMPA permit request and are requesting early consultation via this letter. Therefore, it is requested that the previous IMPASS request for permit and any associated consultation with the Endangered Species Division be closed.

Additionally, the Atlantic Fleet Active Sonar Training (AFAST) EIS/OEIS which covers the use of mid-frequency sonar training by USFF on the Atlantic and Gulf coasts will be incorporated by reference into the three East Coast TAP EIS/OEISs.

We appreciate your continued support in helping us to meet our MMPA and Section 7 responsibilities. My point of contact for this matter is Ms. Elizabeth Phelps 703-604-5420 or Elizabeth.phelps@navy.mil, or Commander, U. S. Fleet Forces Command point of contact is Mr. David Noble, 757-836-7147 or William.d.noble@navy.mil.

Sincerely,

Ronald Tickle
Head, Operational Environmental Readiness and Planning Branch
Environmental Readiness Division
(OPNAV N45)

Enclosures:

(1) Preliminary Draft Description of Proposed Action and Alternatives for the VACAPES Range Complex Environmental Impact Statement/Overseas Environmental Impact Statement (September 2007)
(2) Preliminary Draft Description of Proposed Action and Alternatives for the Navy Cherry Point Range Complex Environmental Impact Statement/Overseas Environmental Impact Statement (December 2007)
(3) Preliminary Draft Description of Proposed Action and Alternatives for the Jacksonville Range Complex Environmental Impact Statement/Overseas Environmental Impact Statement (September 2007)

Copy to (w/ enclosures):
Ms. Angela Somma,
Chief, Endangered Species Division, NMFS

Copy to (w/o enclosures):
OPNAV N43
USFF N4/N7

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO
5090
Ser N456K/7U158356
4 January 2008

Ms. Angela Somma
Division Chief Endangered Species Division
Office of Protected Resources
National Oceanic and Atmospheric Administration
National Marine Fisheries Service (NMFS)
B-SSMC3 Room 13821
1315 East-West Highway
Silver Springs, MD 20910-3282

Dear Ms. Somma:

The Commander, U.S. Fleet Forces is preparing Draft Environmental Impact Statements/Overseas Environmental Impact Statements (EIS/OEIS) to support and conduct current and emerging training and research, development, testing and evaluation (RDT&E) operations and upgrade or modernize capabilities to enhance and sustain Navy training and testing in the Virginia Capes Range Complex (VACAPES Draft EIS/OEIS), Navy Cherry Point Range Complex (NCP Draft EIS/OEIS), and Jacksonville Range Complex (JAX Draft EIS/OEIS). Through our cooperating agency agreement, the Navy and National Marine Fisheries Service (NMFS) are working together to develop these DEISs/OEISs prior to release for public comment.

In a letter dated November 16, 2007, the Navy requested the NMFS' permit division initiate early consultation in anticipation of submitting a Marine Mammal Protection Act (MMPA) request for rulemaking and Letters of Authorization (LOAs). In accordance with 50 CFR §401.12(f), the Navy is submitting relevant chapters of the above mentioned EIS/OEISs as its Biological Evaluation (BE) [Enclosure (1)]. This BE assesses the potential effects of the proposed actions on species protected under the Endangered Species Act that potentially occur in the Range Complexes listed above. These include the following species under NMFS jurisdiction: blue, fin, humpback, North Atlantic right, sei, and sperm whales; green, hawksbill, Kemp's ridley, leatherback, and loggerhead turtles; shortnose sturgeon; and smalltooth sawfish.

In accordance with 50 CFR §401.14(c) the attached BE includes: (1) a description of the proposed action; (2) descriptions of the specific areas where the proposed action will occur (also called Study Area for each of the Range Complexes); (3) descriptions of the listed species and critical habitat that may be affected by

the actions; (4) the potential effects on listed and proposed species or critical habitat; (5) an analysis of cumulative effects; and (6) measures proposed by the Navy to mitigate potential effects of the proposed action.

Additional technical information regarding the process by which the Navy determined the listed species distribution in these geographic areas is detailed in Enclosures 2-6. These reports are in a draft stage, and would benefit from your staff's input, should any technical errors be identified. In addition, Navy utilized density estimates derived from standard reports previously provided to your office (Reference A). We are providing these reports as additional relevant technical information for purposes of consultation under the Endangered Species Act.

The Navy is requesting consultation for the Preferred Alternative (Alternative 2) for each of the Range Complexes. The BE includes a description of the No Action Alternative and Alternative 1 for each Range Complex because in the Draft EIS/OEIS the proposed action in each alternative is additive to the previous alternative (i.e., Alternative 2 includes all activities proposed under Alternative 1 and the No Action Alternative). The Navy will not make its decision of which alternative it will implement until the Record of Decision (ROD) is signed at the conclusion of the NEPA process. Consequently, should the Navy decide to implement an alternative besides Alternative 2 in any or all of the range complexes, the effects to listed species would be the same or less than those evaluated in this consultation.

The following is a brief summary of Navy's determination of effect in each Study Area for each listed species that may occur there:

Virginia Capes (VACAPES) Study Area - One or more stressors associated with Alternative 2 may affect blue, fin, humpback, North Atlantic right, sei, and sperm whales; green, hawksbill, Kemp's ridley, leatherback, and loggerhead turtles; and shortnose sturgeon. Alternative 2 would have no effect on smalltooth sawfish. The Navy requests NMFS provide a Biological Opinion for those species for which we have determined effects.

Navy Cherry Point Study Area - One or more stressors associated with Alternative 2 may affect blue, fin, humpback, North Atlantic right, sei, and sperm whales and green, hawksbill, Kemp's ridley, leatherback, and loggerhead turtles. Alternative 2 would have no effect on shortnose sturgeon or smalltooth sawfish. The determination of no effect to the shortnose sturgeon and smalltooth sawfish is based on data that indicate that these

species are not expected to be present in the Study Area. Accordingly, the BE does not include further analysis of these species (i.e., a fish section is not included for the Navy Cherry Point Study Area). Navy requests NMFS provide a Biological Opinion for those species for which we have determined effects.

Jacksonville Study Area - One or more stressors associated with Alternative 2 may affect blue, fin, humpback, North Atlantic right, sei, and sperm whales; green, hawksbill, Kemp's ridley, leatherback, and loggerhead turtles; shortnose sturgeon; and smalltooth sawfish. Navy requests that NMFS provide a Biological Opinion for each of these listed species.

My staff point of contact for this matter is Elizabeth Phelps who can be reached at 703-604-5420 or via email at Elizabeth.phelps@navy.mil.; Commander, U.S. Fleet Force's point of contact for this matter is David Noble, who can be reached at (757)-836-7147 or via email at William.d.noble@navy.mil.

Sincerely,

Ronald E. Tickle
Head, Operational Environmental
Readiness and Planning Branch
Environmental Readiness Division
(OPNAV N45)

Enclosures:

(1) Biological Evaluation for Virginia Capes, Navy Cherry Point, and Jacksonville Range Complexes.
(2) Narration of the Existing Environment for the Marine Resources of the Mouth of the Chesapeake Bay (Final Report September 2007-CD Copy).
(3) Marine Resources Assessment Update for the Virginia Capes Operating Area (Draft Report June 2007-CD Copy)
(4) Marine Resources Assessment Update for the Cherry Point Operating Area (Draft Report May 2007-CD Copy)
(5) Marine Resources Assessment Update for the Charleston/Jacksonville Operating Area (Draft Report August 2007-CD Copy)

Reference:

(A) Navy OPAREA Density Estimates (NODE) for the Southeast OPAREAS: VACAPES, CHPT, JAX/CHASN, and Southeastern Florida & AUTEC-Andros. (2007).

Copy to (w/Enclosure 1):

Mr. David Bernhart
Assistant Regional Administrator for Protected Resources
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701

Ms. Mary Colligan
Assistant Regional Administrator for Protected Resources
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Regional Office
One Blackburn Dr.
Gloucester, MA 01930

Copy to (w/o enclosures):
DASN (E)
OPNAV N43
FFC N4/7
CNRSE (N45)

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO

5090
Ser N456P/8U158091
21 March 2008

Mr. P. Michael Payne, Division Chief
Permits, Conservation and Education Division
Office of Protected Resources
National Oceanic and Atmospheric Administration
National Marine Fisheries Service (NMFS)
B-SSMC3 Room 13822
1315 East-West Highway
Silver Spring, MD 20910-3282

Dear Mr. Payne,

In accordance with the Marine Mammal Protection Act, as amended and 50 CFR Part 216.106, the U.S. Navy requests a Letter of Authorization (LOA) for the incidental take of marine mammals associated with the proposed at-sea training activities in the established Virginia Capes (VACAPES) Range Complex.

The Commander, U.S. Fleet Forces (USFF) is proposing to support and conduct current and emerging training and research, development, test, and evaluation (RDT&E) operations in the VACAPES Range Complex. In addition, VACAPES Range Complex capabilities will be upgraded or modernized to enhance and sustain Navy training and testing. The proposed action will involve explosive operations. There will be no sonar use. Navy explosive detonations conducted during mine warfare, surface warfare, and strike warfare operations may expose certain marine mammals to underwater sound.

Enclosure (1) focuses on the specific information required by the National Marine Fisheries Service for consideration of an incidental take request. Note, enclosure (1) contains a remnant restricted distribution statement in the footer that has been removed in the electronic version.

We appreciate your continued support in helping the Navy to meet its environmental responsibilities. My staff point of contact for this action is Ms. Linda S. Petitpas at (703) 604-1233, or e-mail Linda.petitpas@navy.mil. Commander, U.S. Fleet Forces point of

contact for this matter is W. David Noble at (757) 836-6938 or email william.d.noble@navy.mil.

Sincerely,

M. S. REISMEIER
CDR, JAGC, U.S. Navy
Acting Deputy Director
Environmental Readiness Division
(OPNAV N45)

Enclosure:

(1) Request for Letter of Authorization for the Incidental Harassment of Marine Mammals Resulting from Navy Training Operations Conducted Within the VACAPES Range Complex (March 2008) delivered via FedEx under separate cover on 17 Mar 08.

Copy to (w/o enclosure):
DASN (E)
OPNAV N43
CNIC (N45)
NAVFACLANT (EV2)
COMNAVREG MidLant

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC
6506 HAMPTON BLVD
NORFOLK VA 23508-1278

TELEPHONE NO:
(757) 322-4940

IN REPLY REFER TO:
5090
EV53DR:lfm
May 12, 2008

Ms. Gloria Bell, Chief
U.S. Fish and Wildlife Service, Southeast Region
Species and Habitat Assessment Branch
1875 Century Boulevard, Suite 400
Atlanta, GA 30345

RE: ENDANGERED SPECIES ACT SECTION 7 CONSULTATION PACKAGE FOR SPECIES UNDER U.S. FISH AND WILDLIFE SERVICE (USFWS) JURISDICTION AT THREE EAST COAST RANGE COMPLEXES

Dear Ms. Bell:

The Commander, U.S. Fleet Forces is preparing Draft Environmental Impact Statements/Overseas Environmental Impact Statements (EISs/OEISs) in accordance with the National Environmental Policy Act (NEPA) to increase use and enhance capabilities of the Virginia Capes (VACAPES) Range Complex, Navy Cherry Point Range Complex, and Jacksonville (JAX) Range Complex (including JAX Atlantic Ocean, Rodman Range, and Lake George Range study areas) to achieve and maintain Fleet readiness.

In accordance with legal requirements set forth under regulations implementing Section 7 of the Endangered Species Act (ESA) (50 Code of Federal Regulations 402; 16 U.S. Code 1536 (c)) this consultation package includes descriptions of the proposed actions, species accounts and status of the species in the study areas, effects of the actions, conclusions, list of contacts, and references.

The proposed action is described as Alternative 2 (Preferred Alternative) from the EISs/OEISs for each range complex in the attached consultation package. An overview of the proposed actions for each range complex is provided in Appendix A, and more specific details are provided in appendices B, C, and D. Mitigation measures which are implemented to reduce the potential impacts to listed species and critical habitat are presented in Appendix E.

A request for technical assistance was submitted to the USFWS Jacksonville Office on September 27, 2007. The USFWS Jacksonville Office responded to the request in a letter dated December 11, 2007, and provided information regarding threatened and endangered species that may occur on or near the Rodman and Lake George Ranges. While not part of the Section 7 consultation process, a request for technical assistance was also submitted to the Florida Fish and Wildlife Conservation Commission (FFWCC). The FFWCC responded in a letter dated October 15, 2007, and provided information regarding listed species that may occur on or near the Rodman and Lake George Ranges.

5090
EV53DR:lfm
May 12, 2008

Through our cooperating agency agreement, the Navy and the National Marine Fisheries Service (NMFS) are working together to develop the EISs/OEISs prior to release for public comment. The Navy has initiated a separate Section 7 consultation with NMFS for species under their jurisdiction, including listed whales, sea turtles in the marine environment, and fish.

The species addressed in this consultation package include the Bermuda petrel (*Pterodroma cahow*), Florida scrub-jay (*Aphelocoma coerulescens*), red-cockaded woodpecker (*Picoides borealis*), roseate tern (*Sterna dougallii*), wood stork (*Mycteria americana*), West Indian manatee (*Trichechus manatus*) (including designated critical habitat), American alligator (*Alligator mississippiensis*), eastern indigo snake (*Drymarchon corais couperi*), sand skink (*Neoseps reynoldsi*), pondberry (*Lindera melissifolia*), clasping warea (*Warea amplexifolia*), Lewton's polygala (*Polygala lewtonii*), and scrub buckwheat (*Eriogonum longifolium* var. *gnaphalifolium*). The proposed action does not occur in any area where there is sea turtle nesting habitat, so sea turtles are not included in this package. There are no species currently proposed for listing that are expected to occur in the action area.

The Navy has determined that the proposed action would not adversely modify critical habitat and would have no effect on the species listed above, except as indicated below:

VACAPES Study Area. The Proposed Action may affect, but is not likely to adversely affect the Bermuda petrel.

Navy Cherry Point Study Area. The Proposed Action may affect, but is not likely to adversely affect the Bermuda petrel.

JAX Atlantic Ocean Study Area. The Proposed Action may affect, but is not likely to adversely affect the West Indian manatee.

Rodman Range Study Area. The Proposed Action may affect, but is not likely to adversely affect the Florida scrub-jay, wood stork, and eastern indigo snake.

Lake George Range Study Area. The Proposed Action may affect, but is not likely to adversely affect the Florida scrub-jay, red-cockaded woodpecker, wood stork, and West Indian manatee.

We look forward to your timely review of the attached consultation package, and request your concurrence that the proposed action may affect, but is not likely to adversely affect listed species under your jurisdiction. My staff point of contact for this matter is Ms. Deanna Rees, who can be reached at (757) 322-4940 or via email at deanna.rees@navy.mil.

Sincerely,

R. D. CURFMAN
Environmental Business Line Manager

Attachment 1: Endangered Species Act Section 7 Consultation Package for Species Under U.S. Fish and Wildlife Service Jurisdiction at Three East Coast Range Complexes, May 2008 (Bound document with CD in PDF format)

5090
EV53DR:lfm
May 12, 2008

Copy to (w/Attachment 1):
Chief, Division of Endangered Species
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9589
Commander, NAS Jacksonville
Commander, USFF (Dave Noble)
Commander, NAVFAC Southeast (Barbara Howe)
Commander, NAVFAC Southeast (Bernice Snyder)
CNO N45 (Kelly Brock)
CNO N45 (Elizabeth Phelps)

IN REPLY REFER TO:

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Custom House, Room 244
200 Chestnut Street
Philadelphia, Pennsylvania 19106-2904

TAKE PRIDE IN AMERICA

August 28, 2008

ER 08/758

Commander
EV22ES
Naval Facilities Engineering Command Atlantic
6506 Hampton Blvd.
Norfolk, Virginia 23508-1278

Dear Sir:

The Department of Interior (Department) has reviewed the Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS/OEIS), evaluating potential environmental effects associated with testing and training activities in the Virginia Capes (VACAPES) Range Complex, Delaware, Maryland, Virginia, and North Carolina. Please give careful consideration to the following comments.

In a January 2007 response to the Navy's December 2006 scoping package for the "Notice of Intent to Prepare an Environmental Impact Statement/ Overseas Environmental Impact Statement for the Virginia Capes Range Complex," the Department noted that the federally listed, endangered Bermuda petrel occurs in ocean waters off the North Carolina coast. The DEIS/OEIS adequately describes the status and distribution of the Bermuda petrel. Although the document states that there are no density data for the Bermuda petrel within the Study Area, we agree the likelihood of the bird occurring in distributions where they would be vulnerable to effects of range operations is relatively remote.

The DEIS/OEIS also discusses potential effects on a wide variety of seabirds that are known to occur in the western Atlantic. In addition to the Bermuda petrel, 60 species are contained in a list of birds that might occur in the study area. The DEIS/OEIS recognizes the presence and importance of several Important Bird Areas (IBAs) in and near the VACAPES study area. Migrating seabirds, including the Bermuda petrel and black-capped petrel would be expected to inhabit the Outer Continental Shelf IBA during their regularly observed periods.

Appendix K of the VACAPES DEIS/OEIS appropriately references the provisions of the 2003 National Defense Authorization Act that provide for the Secretary of the Interior to prescribe incidental take exemptions for the Armed Forces during military readiness activities. Under the final rule that resulted from this Act, which authorizes take of migratory birds by the Armed Forces and was published in the Federal Register on February 28, 2007, the Navy would confer

and cooperate with the U.S. Fish and Wildlife Service (Service) on the development of conservation measures to minimize/mitigate adverse effects associated with military training, if the Navy determines that such activities may have a significant adverse effect on migratory bird species. We note that the final rule states "...,the Armed Forces will use the best scientific data available to assess through the NEPA process, or other environmental requirements, the expected impact of proposed or ongoing military readiness activities on migratory bird species likely to occur in the action areas." Accordingly, we look forward to reviewing the latest/best information available regarding migratory seabirds in the Final EIS.

Existing mechanisms to ensure coordination between the military and the Service on natural resources issues, such as the Sikes Act Improvement Act of 1997, may not apply to this proposed action. If the Navy's proposed action is implemented, we would expect the Service and the Navy to continue to discuss new information and consider potential efforts to minimize, mitigate, and monitor take of migratory birds.

For questions and further coordination, please contact John Hammond, Ecological Services, U.S. Fish and Wildlife Service, P.O. Box 33726, Raleigh, North Carolina, 27636-3726, telephone 919-856-4520. Thank you for the opportunity to comment on the DEIS/OEIS.

Sincerely,

Michael T. Chezik

Michael T. Chezik
Regional Environmental Officer

cc:
J. Hammond, FWS, Raleigh, NC
T. Dean, FWS, Gloucester, VA
G. Hogue, OEPC, Atlanta, GA

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO

5090
Ser N456K/8U158287
15 September 2008

Ms. Angela Somma
Division Chief Endangered Species Division
Office of Protected Resources
National Oceanic and Atmospheric Administration
National Marine Fisheries Service (NMFS)
B-SSMC3 Room 13821
1315 East-West Highway
Silver Springs, MD 20910-3282

Dear Ms. Somma:

On January 4, 2008, the Navy submitted a Biological Evaluation (BE) in support of three range complex Environmental Impact Statements; Virginia Capes (VACAPES), Cherry Point, and Charleston/Jacksonville (CHASN/JAX). The Navy has continued to refine its analysis since this submittal, including some changes to the preferred alternative. Navy previously provided NMFS with an email summarizing these changes, which resulted in a reduction of potential exposures. Those changes are summarized below:

VACAPES:

- Significant reduction of live at-sea BOMBEX to 5 events total (4 Mk-83 bombs per event = 20 per year), new location in Air-Kilo as shown on map. Elimination of live at sea-BOMBEX in 3B1, 3B2, 3B3 and 3B4. Also, these events were remodeled to 177dB to account for multiple explosions.
- Addition of 20 Maverick missiles per year (NEW 100#)

Cherry Point

- Elimination of live at-sea BOMBEX completely
- Addition of 8 TOW missiles per year (NEW 15.3 #)
- Addition of 6 Hellfire missiles per year (NEW 8#)
- Addition of 8 HARM missiles per year (NEW 48#)

CHASN/JAX:

- Elimination of live at-sea BOMBEX completely
- FIREX with IMPASS restricted to BB and CC for spring and summer. No live FIREX with IMPASS during NARW calving season.

To assist in your efforts to review these changes, we have prepared a replacement BE for the January 4, 2008 submittal. This version is a more streamlined version which considers the changes in the proposed action reflected above as well as considering the effects to the species across the three range complexes due to their close proximity. Navy requests for NMFS to utilize this updated information when preparing their biological opinion.

My staff point of contact for this matter is Elizabeth Phelps who can be reached at 703-604-5420 or via email at Elizabeth.phelps@navy.mil.; Commander, U.S. Fleet Force's point of contact for this matter is Hank Eacho, who can be reached at 757-836-7257 or via email at harrison.eacho@navy.mil.

Sincerely,

Ronald E. Tickle
Head, Operational Environmental
Readiness and Planning Branch
Environmental Readiness Division
(OPNAV N45)

Enclosure:
(1) Biological Evaluation for Three East Coast Range Complexes.

Copy to (w/Enclosure 1):

Mr. David Bernhart
Assistant Regional Administrator for Protected Resources
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701

Ms. Mary Colligan
Assistant Regional Administrator for Protected Resources
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Regional Office
One Blackburn Dr.
Gloucester, MA 01930

Copy to (w/o enclosures):
DASN (E)
OPNAV N43
FFC N4/7
CNRSE (N45)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

In Reply Refer To:
FWS/R4/ES

OCT 7 2008

Mr. R. D. Curfman
Environmental Business Line Manager
Naval Facilities Engineering Command
6506 Hampton Boulevard
Norfolk, Virginia 23508-1278

Dear Mr. Curfman:

On May 12, 2008, we received your consultation request for increased use and enhanced capabilities at three East Coast range complexes. Your consultation package addressed the effects of your preferred action alternative on: Bermuda petrel (*Pterodroma cahow*), Florida scrub-jay (*Aphelocoma coerulescens*), red-cockaded woodpecker (*Picoides borealis*), roseate tern (*Sterna dougallii*), wood stork (*Mycteria americana*), West Indian manatee (*Trichechus manatus*) (including designated critical habitat), American alligator (*Alligator mississippiensis*), eastern indigo snake (*Drymarchoncorais couperi*), sand skink (*Neoseps reynoldsi*), pondberry (*Lindera melissifolia*), clasping warea (*Warea amplexifolia*), Lewton's polygala (*Polygala lewtonii*), and scrub buckwheat (*Eriogonum longifolium var. gnaphalifolium*). In your original consultation package, the Navy concluded that the proposed use and enhancement of the range complexes would have no effect or would not be likely to adversely affect all of the federally-listed species and potentially affected critical habitats considered.

In response to your consultation request, the Fish and Wildlife Service (Service) coordinated your consultation package with all of our affected Field Offices in the Southeast and Northeast Regions. At that time, the Service was unable to concur with your determination and requested clarification of the proposed program or suggested conservation measures, which if incorporated into your proposed action, would ensure that effects of the proposed action would not adversely affect any federally-listed species. On July 7, 2008, the Navy responded with clarification of the proposed action and included conservation measures for the manatee, which would be included in the action to reduce the likelihood for adverse effects. Although the Navy's original consultation package did not specifically address the piping plover *(Charadrius melodus)*, in response to concerns expressed by the Service, the Navy also proposed protective measures to ensure that piping plovers were not affected by the proposed action. Following the Navy's response, the Service had one remaining concern, however, about the Navy's ability to detect and conserve manatees at the Lake George Range.

On September 25, 2008, the Navy contacted our Southeast Region to discuss the results of a site visit with Mr. John Milio of the Service, to the Navy's Range Operations Center in Pinecastle, Florida. As a result of the discussion and site visit, the Service was able to concur that adverse effects to the Florida manatee are highly unlikely.

Our response is based on our review of your consultation package received on May 12, 2008, the clarifications and conservation measures provided by the Navy on July 7, 2008 (copy attached), and information given to the Service during our on-site visit to the Range Operations Center in Pinecastle, Florida, in August 2008. Our response represents both the Northeast and Southeast Regions, and is the result of review by all Service Field Offices within the area affected by your proposed action. We concur that the proposed action (preferred alternative) for increased operations and enhanced capabilities in three East Coast range complexes will have no effect on, or is not likely to adversely affect the federally-listed species or designated critical habitat as determined in your consultation package of May 12, 2008. We greatly appreciate your willingness to clarify the proposed action and include conservation measures for the protection of federally-listed species.

Please be reminded that it may be necessary for you to contact the Service for reconsideration of the effects of this proposed action if:

(1) New information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in your current determination;

(2) The action is later modified in a manner that causes an effect to the listed species or critical habitat not considered in this informal consultation; or

(3) A new species is listed or critical habitat designated that may be affected by this action.

Please address any questions concerning this response to Ken Graham at 404/679-7358.

Sincerely yours,

Franklin J, Arnold III
Acting Assistant Regional Director

Attachment

Section 7 Consultation for three East Coast Range Complexes
7 July 2008

	FWS Request	Navy Response
1.	Aerial manatee watch immediately prior to NEPM sortie and within flight path. (Navy can combine the manatee watch with its pre-sortie aerial safety survey of watercraft that may be within the target area or flight path of the aircraft). Justification: Lake George is a relatively shallow waterbody, manatees may occur in other areas of the lake besides its shoreline more often than in other, deeper waterbodies. There are no guarantees that the NEPM will strike the middle of the target at each sortie. Manatees may be attracted to splash.	Prior to releasing NEPM, P-3 aircraft would do a pass at 300 ft, ~200 knots as a clearing run looking for boats, fishermen, and manatees. To enhance the ability of the P-3 aircrew to spot a manatee near the target area, the aircrew would use the Electro Optic/Infra Red sensors which would enable the aircrew to detect surfacing manatees. Bombs are not dropped in close proximity of space or time. In a sortie, the four NEPM bombs are dropped one per target (4 total), seconds apart and sorties occur hours/days apart. If a manatee were attracted to the splash it would not arrive at the drop point until after all the NEPM is delivered for that sortie.
2.	The survey aircraft will monitor the site throughout the planned sortie and for five minutes following the last sortie to observe any manatee that may have been injured by the exercise.	The tower and range cameras will observe range/impact areas for 5 minutes following the sortie (after the last NEPM is dropped) to observe if any manatee was injured by the exercise.
3.	Survey shall consist of a pilot and aerial observer who has experience in aerial manatee observation	The pilot and at least one observer on board are trained to look for marine mammals and have completed the US Navy Marine Species Awareness Training.
4.	Rotary-winged aircraft is preferable to a fixed-winged aircraft in terms of maneuverability	Sorry, this is not practicable.
5.	Navy provide a statement in its consultation package indicating that it will adhere to the best management practices regarding manatees while within the NSM basin and channel, in accordance with that installation's 2007 INRMP	The Navy concurs that it will adhere to the best management practices regarding manatees while within the NSM basin and channel, in accordance with that installation's 2007 INRMP.

6.	Navy add the following language to part 7 of section 6.3.2 "Operating Procedures and Collision Avoidance", of its consultation package. "While transiting estuarine waters associated with the St. Johns River, vessels will comply with all Federal, State, and local manatee protection speed zones".	Dependent upon current military operations and security threat level, the Navy concurs that during routine transit in estuarine waters associated with the St. Johns River, vessels will comply with all Federal, State, and local manatee protection speed zones as long as it is operationally safe to do so.
7.	If any manatees are observed within the aircraft flight path, or 500 feet on either side of the flight path, the sortie will not commence until the manatee moves out of this area under its own volition.	The Navy concurs.
8.	In case of any harassment, injury, or death involving the manatee from the action, the Navy will immediately halt all remaining sorties and report the incident, including dead or injured animals, to the Florida Fish and Wildlife Conservation Commission, Law Enforcement Division, at 1-888-404-3922. The Navy shall also report the incident to the U.S. Fish and Wildlife Service, Jacksonville Ecological Field Office, at 904-731-3336.	The Navy concurs.
9.	(For piping plovers) In other consultations, we have recommended both horizontal and vertical buffers of up to 1,000 meters or more depending on the activities proposed to avoid and minimize impacts to plovers. However, we don't have a standard buffer distance, and I don't know what buffer distances would be appropriate for the activities proposed at this time. Figure 2.2.3 of Appendix B of the document provided indicates that training may occur close to the shore in that region, though I understand that it won't occur directly over the beach due to water depth requirements. In addition, the configuration of training areas identified in Figure 2.2-4 creates a possibility that helicopters will travel at low altitudes near beaches en route to training areas. FWS would like additional information about the proximity of proposed helicopter flights to the shore of the Chesapeake.	Helicopters will not fly within 1 nautical mile (NM) of the beach.

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC
6506 HAMPTON BLVD
NORFOLK, VA 23508-1278

IN REPLY REFER TO:
5090
EV22CMK:lfm
February 9, 2009

Delaware State Historic Preservation Officer
Division of Historical and Cultural Affairs
21 The Green
Dover, DE 19901

Subj: SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT (NHPA), DETERMINATION OF "NO HISTORIC PROPERTIES AFFECTED" FOR THE VIRGINIA CAPES RANGE COMPLEX TRAINING OPERATIONS

Dear Sir:

The Navy is preparing a Final Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) to assess the potential environmental impacts over a 10-year planning horizon associated with Navy Atlantic Fleet training; research, development, testing, and evaluation activities; and associated range capabilities enhancements (including infrastructure improvements) in the Virginia Capes Range Complex. The western boundary of the Virginia Capes Range Complex is 3 nautical miles offshore. Proposed training operations will not occur within state jurisdictional waters.

For your review, the following attachments are enclosed: Chapter 2 of the EIS/OEIS "Description of Proposed Action and Alternatives" and Chapter 3, Section 3.12 "Cultural Resources." Chapter 2 provides a description of the proposed training operations and their associated locations. Section 3.12 provides an assessment of the impacts to cultural resources as a result of the proposed training operations in the VACAPES OPAREA.

The EIS/OEIS identifies five areas within the Virginia Capes Range Complex where proposed training operations have the potential to impact submerged cultural resources. These areas (Instrumented Training Area-North and South, Warning Areas 50A, 50B, and 50C) are not located in Delaware state waters.

The Navy has made the determination of no historic properties affected by the proposed operation of training activities within the jurisdictional waters of Delaware. We request that within 30 days you provide your views and comments on our finding of no historic properties

5090
EV22CMK:lfm
February 9, 2009

affected. If you have any questions, please contact Christine Koussis at (757) 322-8155 or Bruce Larson at (757) 322-4885.

Sincerely,

C. W. WALKER, P.E.
Head, Environmental Planning Branch
Environmental Business Line

Attachments:
(A) Chapter 2 - Description of Proposed Action and Alternatives
(B) Chapter 3.12 – Cultural Resources

Copy to:
FFC (N77)
NAVFAC MidLant (EV)

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC
6506 HAMPTON BLVD
NORFOLK, VA 23508-1278

IN REPLY REFER TO:
5090
EV22CMK:lfm
February 9, 2009

Mr. J. Rodney Little
Director and SHPO
Maryland Historical Trust, Division of Historical and Cultural Programs
100 Community Place
Crownsville, MD 21032-2023

Subj: SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT (NHPA), DETERMINATION OF "NO HISTORIC PROPERTIES AFFECTED" FOR THE VIRGINIA CAPES RANGE COMPLEX TRAINING OPERATIONS

Dear Mr. Little:

The Navy is preparing a Final Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) to assess the potential environmental impacts over a 10-year planning horizon associated with Navy Atlantic Fleet training; research, development, testing, and evaluation activities; and associated range capabilities enhancements (including infrastructure improvements) in the Virginia Capes Range Complex. The western boundary of the Virginia Capes Range Complex is 3 nautical miles offshore. Proposed training operations will not occur within state jurisdictional waters.

For your review, the following attachments are enclosed: Chapter 2 of the EIS/OEIS "Description of Proposed Action and Alternatives" and Chapter 3, Section 3.12 "Cultural Resources." Chapter 2 provides a description of the proposed training operations and their associated locations. Section 3.12 provides an assessment of the impacts to cultural resources as a result of the proposed training operations in the VACAPES OPAREA.

The EIS/OEIS identifies five areas within the Virginia Capes Range Complex where proposed training operations have the potential to impact submerged cultural resources. These areas (Instrumented Training Area-North and South, Warning Areas 50A, 50B, and 50C) are not located in Maryland state waters.

The Navy has made the determination of no historic properties affected by the proposed operation of training activities within the jurisdictional waters of Maryland. We request that within 30 days you provide your views and comments on our finding of no historic properties

5090
EV22CMK:lfm
February 9, 2009

affected. If you have any questions, please contact Christine Koussis at (757) 322-8155 or Bruce Larson at (757) 322-4885.

Sincerely,

C. W. WALKER, P.E.
Head, Environmental Planning Branch
Environmental Business Line

Attachments:
(A) Chapter 2 - Description of Proposed Action and Alternatives
(B) Chapter 3.12 – Cultural Resources

Copy to:
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NAVFAC MidLant (EV)

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC
6506 HAMPTON BLVD
NORFOLK, VA 23508-1278

IN REPLY REFER TO:
5090
EV22CMK:lfm
February 9, 2009

Mr. Marc Holma
Architectural Historian
Review and Compliance
Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

Subj: SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT (NHPA), DETERMINATION OF "NO HISTORIC PROPERTIES AFFECTED" FOR THE VIRGINIA CAPES RANGE COMPLEX TRAINING OPERATIONS

Dear Mr. Holma:

The Navy is preparing a Final Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) to assess the potential environmental impacts over a 10-year planning horizon associated with Navy Atlantic Fleet training; research, development, testing, and evaluation activities; and associated range capabilities enhancements (including infrastructure improvements) in the Virginia Capes Range Complex. The western boundary of the Virginia Capes Range Complex is 3 nautical miles offshore. All proposed training operations will occur within the boundaries of the Virginia Capes Range Complex with the exception of Mine Warfare training operations, which will occur within the lower Chesapeake Bay.

The EIS/OEIS identifies five areas within the Virginia Capes Range Complex where proposed training operations have the potential to impact submerged cultural resources. These areas are the Instrumented Training Area (ITA)-North and South, which are located in the lower Chesapeake Bay, and Warning Areas 50A, 50B, and 50C, which are located 3 nautical miles offshore of Virginia. The EIS/OEIS provides a detailed description of the training operations proposed for these areas and an assessment of the impacts to Cultural Resources (see Attachments A and B).

To further identify any cultural resources that might be within each area, the Southeastern Archaeological Research, Inc. conducted a literature review and applied a predictive model for submerged cultural resources. Review of available databases identified multiple wreck sites, obstructions and unknown targets within the ITA-North and ITA-South areas. Multiple wreck sites, obstructions and unknown targets were identified in Warning Areas 50A and 50B, while a couple of obstructions were identified in Warning Area 50C. Application of the predictive model indicates both ITA-North and ITA-South have the highest potential to contain submerged cultural resources within the proposed Training Areas. Of the Warning Areas, W50B is considered a high-probability area; W50A is considered a moderate probability area; and W50C is considered a lower-probability area. The exact locations of these resources identified in his report will be safeguarded by the Navy as they are considered sensitive information and

specifically excluded from public dissemination under Section 304 of the NHPA. A copy of the 2009 technical memorandum describing the results of the literature search and predictive model is enclosed for your review as Attachment C.

To ensure protection of submerged cultural resources in the areas identified above, the Navy will implement the following mitigation measures. The Navy will provide locations of known shipwrecks to operators during training activities so that these resources may be safely avoided. In addition, ships will not anchor in areas of known shipwrecks. Furthermore, detonations or explosions would not occur within ITA-North and South.

Based on the results of the enclosed technical memorandum, the EIS/OEIS, and the Navy approach to avoid submerged cultural resources, the Navy has made the determination of no historic properties affected by the proposed operation of training activities within the jurisdictional waters of Virginia. We request that within 30 days you provide your views and comments on our finding of no historic properties affected. If you have any questions, please contact Christine Koussis at (757) 322-8155 or Bruce Larson at (757) 322-4885.

Sincerely,

Charles W. Walker

C. W. WALKER, P.E.
Head, Environmental Planning Branch
Environmental Business Line

Attachments:
A) Chapter 2 - Description of Proposed Action and Alternatives
B) Chapter 3.12 - Cultural Resources
C) Technical Memorandum

Copy to:
FFC (N77)
NAVFAC MidLant (EV)

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC
6506 HAMPTON BLVD
NORFOLK, VA 23508-1278

IN REPLY REFER TO:
5090
EV22CMK:lfm
February 9, 2009

Dr. Jeffrey Crow
Deputy Secretary and SHPO
North Carolina Office of Archives and History
4610 Mail Service Center
Raleigh, NC 27699-4610

Subj: SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT (NHPA), DETERMINATION OF "NO HISTORIC PROPERTIES AFFECTED" FOR THE VIRGINIA CAPES RANGE COMPLEX TRAINING OPERATIONS

Dear Dr. Crow:

The Navy is preparing a Final Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) to assess the potential environmental impacts over a 10-year planning horizon associated with Navy Atlantic Fleet training; research, development, testing, and evaluation activities; and associated range capabilities enhancements (including infrastructure improvements) in the Virginia Capes Range Complex. The western boundary of the Virginia Capes Range Complex is 3 nautical miles offshore. Proposed training operations will not occur within state jurisdictional waters.

For your review, the following attachments are enclosed: Chapter 2 of the EIS/OEIS "Description of Proposed Action and Alternatives" and Chapter 3, Section 3.12 "Cultural Resources." Chapter 2 provides a description of the proposed training operations and their associated locations. Section 3.12 provides an assessment of the impacts to cultural resources as a result of the proposed training operations in the VACAPES OPAREA.

The EIS/OEIS identifies five areas within the Virginia Capes Range Complex where proposed training operations have the potential to impact submerged cultural resources. These areas (Instrumented Training Area-North and South, Warning Areas 50A, 50B, and 50C) are not located in North Carolina state waters.

The Navy has made the determination of no historic properties affected by the proposed operation of training activities within the jurisdictional waters of North Carolina. We request that within 30 days you provide your views and comments on our finding of no historic properties affected. If you

5090
EV22CMK:lfm
February 9, 2009

have any questions, please contact Christine Koussis at (757) 322-8155 or Bruce Larson at (757) 322-4885.

Sincerely,

Charles W. Walker

C. W. WALKER, P.E.
Head, Environmental Planning Branch
Environmental Business Line

Attachments:
(A) Chapter 2 - Description of Proposed Action and Alternatives
(B) Chapter 3.12 – Cultural Resources

Copy to:
FFC (N77)
NAVFAC MidLant (EV)

North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

Beverly Eaves Perdue, Governor
Linda A. Carlisle, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

February 18, 2009

C. W. Walker, PE
Environmental Planning Branch
Naval Facilities Engineering Command, Atlantic
6506 Hampton Blvd
Norfolk, VA 23508-1278

RE: Virginia Capes Range Complex Training Operations, 5090, EV22CMK:lfm, Multi County, ER08-1565

Dear Mr. Walker:

Thank you for your letter of February 9, 2009, asking that we concur in a finding of no historic properties affected in North Carolina for the above referenced undertaking. We have reviewed the materials submitted and concur with your finding of no historic properties affected by the proposed training operations.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

Peter Sandbeck

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APPENDIX D

CURRENT TRAINING OPERATIONS DESCRIPTION

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APPENDIX D
CURRENT TRAINING OPERATIONS WITHIN THE VIRGINIA CAPES RANGE COMPLEX

This Appendix D describes the current training and RDT&E events conducted in the Virginia Capes (VACAPES) Range Complex in detail. The training event descriptions include both unit level and major range events. A data strip table is provided for each individual training event, as follows:

- Event or operation title
- Participating platforms
- System or ordnance utilized
- Typical event duration
- Number of events ***currently*** conducted on an annual basis in the range complex

Where new platforms are evaluated as part of an EIS/OEIS, the events performed by such platforms are also described in this Appendix D (*e.g.*, MH-60S Organic Mine Countermeasures training events).

Ordnance used during training is defined in this Appendix as either:

- High Explosive (HE) – explosive ordnance[1];
- Non-explosive, practice munition (NEPM) – Non-explosive practice munitions may contain spotting charges or signal cartridges for impact locating purposes; or
- Wholly inert – no explosive, propellant, or pyrotechnic component.

1 If HE ordnance is used in an event, it will be shaded in the data strip.

MINE WARFARE

MINE COUNTERMEASURES EXERCISE (MCM)

Acoustic, mechanical, electronic, and optical methods of mine hunting and minesweeping exercises are included in this category.

Operation	Platform	System/ Ordnance	Event Duration	Number of Events
Mine Counter-measures (MCM)	MH-53E	MK-103[2]	1.5 hours	176 sorties[3]
		SPU-1W	1.5 hours	64 sorties
		MK-104	1.5 hours	104 sorties
		MK-105	1.5 hours	104 sorties
		AQS-24A	1.5 hours	480 sorties
	MH-60S	OASIS	1.5 hours	None
		AQS-20A	1.5 hours	430 sorties
		ALMDS	1.5 hours	None
	RMS (DDG 91+)	AQS-20A	4 hours	None

Organic Mine Countermeasures (OMCM)

Helicopters tow surface sleds and submerged equipment through simulated threat minefields with the goal of clearing a safe channel through the minefield for the passage of friendly ships.

Organic OMCM Mine Hunting Systems

- AN/AQS-20 Mine Hunting System. The AQS-20 is an MH-53 or MH-60S helicopter towed body that contains an active high resolution, side-looking, multibeam sonar system used for mine hunting of deeper mine threats along the ocean bottom. A small diameter electromechanical cable is used to tow the rapidly deployable system that provides real-time sonar images to operators in the helicopter. Operators may then locate, classify, mark, and record mine-like objects and underwater terrain features and pass this information to EOD personnel or other personnel who can neutralize the mine.
- AN/AES-1 Airborne Laser Mine Detection System (ALMDS). ALMDS is an organic mine detection system mounted on and designed for integration into the MH-60S helicopter. The system uses Light Detection and Ranging (LIDAR) blue-green laser technology to detect, classify, and localize floating and near-surface moored mines in shallow water.

OMCM Platforms

- MH-53E Helicopter (Note: VACAPES Range Complex baseline operations are conducted by this platform)
- MH-60S Helicopter (Note: VACAPES Range Complex future operations are conducted by this platform)

OMCM Sweeping Systems

2 MK-103 uses a 0.002 lb Net Explosive Weight (NEW) charge. Under the no action, no HE cartridges would be used. Only the cable would be towed.

3 Sortie is defined here as a single operational training or testing event conducted by one aircraft in a range or operating area. A sortie is one complete flight (one take-off and one full stop landing). In this table "events" are non-aircraft training or testing platforms. See Chapter 8 (Glossary for a detailed explanation).

- MK-103 Mechanical Minesweeping System. This system is streamed, towed, and recovered by an MH-53 helicopter. The mechanical minesweeping gear is designed to counter moored mines. The gear consists of a tow wire, sweep wires (with explosive cutters activated by a charge similar to a shotgun shell), floats, a depressor, otters, and float pendants.
- MK-104 Acoustic Minesweeping System. This system is streamed, towed, and recovered by an MH-53 helicopter. The towed acoustic sweep system consists of a cavitating disk within a venturi tube, driven by two self-rotating, cavitating disks. The MK-104 is towed directly behind the helicopter or is attached to the MK-105 sled to provide a combination magnetic/acoustic minesweeping system. The total system weight is 180 pounds; the towed body dimensions are 26 inches wide, 35 high, and 49 long.
- MK-105 Magnetic Minesweeping System. This system is towed by an MH-53 helicopter and is a minesweeping hydrofoil sled that becomes foil-borne at about 13 knots (kts). The sled is typically towed at 20 to 25 kts, about 450 feet behind the helicopter. The sled carries a gas turbine generator to power its magnetic sweep gear, which consists of twin magnetic tails. These tails are cables that operate as conventional open-electrode magnetic sweeps about 600 feet long. Launch and recovery of the sled can be from a variety of surface ships (LHD, LHA, LPD, and CV), as well as from shore facilities and beaches. A combined magnetic and acoustic influence sweep may be achieved by adding the MK-104 acoustic system to the sweep array thereby creating the MK-106 system.
- MK-106 Magnetic/Acoustic Minesweeping System. The MK-106 is a helicopter-towed acoustic/magnetic sweep, consisting of the MK-105 sled and the MK-104 acoustic device attached to one of the magnetic tails.
- AN/SPU-1W Magnetic Minesweeping System (referred to as "Magnetic Orange Pipe (MOP)"). The SPU-1W, MOP, is a 30 foot long, 10-3/4 inch diameter, 1,000-lb, magnetized pipe filled with Styrofoam for buoyancy that is used to sweep waters too shallow for using the MK-105 hydrofoil sleds. An MH-53 helicopter can tow as many as three MOPs in tandem to increase sweep effectiveness.
- AN/ALQ-220 Organic Airborne Surface Influence Sweep (OASIS). OASIS is a helicopter-deployed, towed-body, 10 feet long with a 20 inch diameter, which is self-contained, may be towed at speeds up to 40 kts in shallow water, and provides both magnetic and acoustic influence sweeping. It can be towed as a single unit or in tandem with other sweeping systems, and allows for emulation of magnetic and acoustic signatures of the ships and platforms that would transit through an assault area or those that would conduct generic minesweeping operations.

OMCM Training Areas

The use of training areas, constructed of moored or bottom mines, and of instrumented mines that can record effective minesweeping, enhances feedback to equipment operators and overall quality of training attained.

MH-53E Helicopter with Minesweeping and Mine Hunting Gear

The helicopter may be configured with one or more of the following systems designed to sweep or locate mines for later neutralization:

- AN/SPU-1W Magnetic Minesweeping System
- MK-103 Mechanical Minesweeping System
- MK-104 Acoustic Minesweeping System
- MK-105 Magnetic Minesweeping System
- MK-106 Magnetic/Acoustic Minesweeping System
- AN/AQS-20 Mine Hunting System

Basic Phase (Unit Level Training) Scenario

One helicopter configured for the mine countermeasures mission to be conducted flies from a shore location or a surface ship, such as an LHA, to the selected mine threat area.

The helicopter will fly within 50 to 75 feet of the water while towing the appropriate system for the tactical situation. Systems are towed on the surface or down to a depth of 150 feet or less for training and at speeds between 8 and 25 kts depending on the system being used.

The use of training minefields of moored or bottom mines enhances feedback to equipment operators and quality of training attained. The typical duration is 1.5 hours.

Integrated and Sustainment Phase Training Scenarios
Procedures typically do not differ from the Basic Phase Scenario, but the operation is part of the larger major range event where the process will be coordinated with other events and controlled through a Strike Group Commander.

Training Considerations
The purpose of training is for helicopter crews to practice deployment, employment, and retrieval of the systems. All systems are recovered upon completion of training.

MH-60S Helicopter with Minesweeping and Mine Hunting Gear
The helicopter may be configured with one or more of the following systems:

- AN/AES-1 ALMDS
- AN/AQS-20 Mine Hunting System
- AN/ALQ-220 OASIS

Basic Phase (Unit Level Training) Scenario
One helicopter will fly from a shore location or surface ship, such as an LHA, LHD, or LCS, configured for the Organic AMCM mission to be conducted. The helicopter will fly within 50 to 75 feet of the water while using or towing the appropriate system for the tactical situation. The AQS-20 and OASIS systems are towed down to a depth of 150 feet or less for training and at speeds between 8 and 40 kts depending on the system. A typical training stream, tow, and recovery period lasts about 1.5 hours.

The use of training minefields enhances feedback to equipment operators and quality of training attained.

Training Considerations
The purpose of training is for helicopter crews to practice deployment, employment, and retrieval of the systems. All systems are recovered upon completion of training.

Mine Countermeasures Exercise - Remotely Operated Vehicle (MCMEX - ROV)

Remotely operated vehicles are typically used to locate and mines that will later be neutralized during the neutralization phase of the mine countermeasures operation.

DDG-91 and Newer, LCS, and EOD with Remote Mine Hunting System (RMS)

The Remote Mine Hunting System (RMS) (AN/WLD-1(V)(1) is an unmanned undersea vehicle (UUV) that will be deployed from the DDG-91 and follow-on ship class hulls. It is a semi-autonomous system that will detect, classify, and identify mines as well as record their precise location for avoidance or subsequent removal or neutralization.

Basic Phase (Unit Level Training) Scenario
RMS is launched from the DDG/LCS which stays clear of the expected mine area. A preprogrammed reconnaissance search profile maneuvers RMS through the selected area where RMS uses its sensors to detect, classify, and localize mine like objects, then use laser imaging to identify the object and transmit

the image to the host ship, where trained EOD personnel evaluate the images and information. The typical duration is 4 hours.

Training Considerations
This system is still in development; training requirements have not been fully developed.

Mine Warfare Planning Criteria

Figure D-1 presents the planning criteria for the various Mine Countermeasures and Mine Neutralization platforms to establish training areas to deploy mine shapes.

TABLE D-1
MINE WARFARE TRAINING AREA PLANNING CRITERIA

MIW TRAINING AREA	MIN DEPTH (ft)	MAX DEPTH (ft)	MAX DISTANCE FROM NS NORFOLK (nm)	TRAINING MINEFIELDS PER TRAINING AREA	TRAINING MINEFIELD DIMENSION (nm)[4]	TYPE OF TRAINING MINES (number per minefield)	LOCATION (Figure)
Instrumented (South)[5]	16	150	15	1	1x4	VEMS (20)	Lower Chesapeake Bay (Fig 2.2-2)
Instrumented (North)[6]	35[7]	150	25	2	1x4	VEMS (20)	Lower Chesapeake Bay (Fig 2.2-3)
Shallow Water Sonar (South)[8]	45	130	30	4	1x4	Bottom (25)	VACAPES OPAREA (Area 13) (Fig 2.2-4)
Shallow Water Sonar (North)	40	130	45	4	1x4	Bottom (25)	VACAPES OPAREA (Area 6) (Fig 2.2-4)
Deep Water Sonar	100	150	50	2	1x4	Moored (13) Bottom (13)	VACAPES OPAREA (Area 13) (Fig 2.2-4)
Mine Neutralization[9] (MK-103)	40	150	45	1	1x4	Moored (20)	VACAPES OPAREA (Area 13)/W-50A&C (Fig 2.2-1)
Mine Neutralization (AMNS)	60	150	15	1	1x1	Moored (5) Bottom (5)	VACAPES OPAREA (Area 13)/W-50C (Fig 2.2-1)
Mine Neutralization (ALMDS/RAMICS)	50	150	15	1	1x4	Moored (10)	VACAPES OPAREA (Area 13)/W-50C (Fig 2.2-1)

4 The mine training areas are much larger than the training minefields to facilitate occasionally relocating individual minefields inside the training areas.
5 Additional planning criteria: a) Remain west of Chesapeake Bay Bridge-Tunnel (CBBT) to facilitate frequent VEMS deployment and recovery via small boat. b) Do not conduct training operations within one mile of civilian beaches or CBBT. c) Avoid main shipping channel through Hampton Roads. d) Training operations within Norfolk International Airport controlled airspace requires coordination with ORF tower.
6 Additional planning criteria: a) Remain west of Chesapeake Bay Bridge-Tunnel (CBBT) to facilitate frequent VEMS deployment and recovery via small boat. b) Do not conduct training operations within one mile of civilian beaches.
7 MK-104 operations, which require at least 35' water depth, can be conducted throughout the training area. OASIS operations require 40' minimum depth which only occurs in about half the training area. Care must be taken when siting the two individual minefields to provide training venues for both systems.
8 Additional planning criteria: a) Avoid Chesapeake Light by at least ½ nm.
9 The MK-103, AMNS and ALMDS/RAMICS training areas could be individual training minefields within a single 100 nm^2 training area. MK-103 operations, with 40' minimum depth requirement, can be conducted throughout W-50A & C. RAMICS operations, which need at least 50' of water depth, can be conducted throughout W-50C only. AMNS operations, which need at least 60' of water, are limited to the approximately 1/3 of W-50C with sufficient water depth. Care must be taken when siting the individual minefields to provide training venues for all three systems.

MINE NEUTRALIZATION

Most, but not all exercises considered in the mine neutralization category are those that employ explosives for neutralization of the mine itself.

Operation	Platform	System/ Ordnance	Event Duration	Number of Events
Mine Neutralization	MH-53E	AMNS	1.5 hours	None
	MH-60S	AMNS[10]	1.5 hours	None
		RAMICS	1.5 hours	None
	EOD	20 lb charges	6-8 hours	12 events

Mine Neutralization-Helicopter (Mine Neutralization-Helo)

Helicopters use specialized weapons to destroy threat moored or bottom mines to create safe channels for friendly shipping.

MH-53E and MH-60S with Airborne Mine Neutralization System (AMNS)

Basic Phase (Unit Level Training) Scenario
The AMNS (AN/ASQ-235) is deployed from an MH-53E or MH-60S helicopter in the area where threat mines have been previously located by other sources. AMNS is lowered into the water by the helicopter where the expendable, self-propelled neutralizer can reacquire the previously located mine with its sonar and video systems. These systems relay their data to the operator in the helicopter through a fiber-optic cable so the operator can then properly position the neutralizer onto the most vulnerable area of the mine. The shaped explosive charge is then detonated to neutralize the mine. The typical duration is 1.5 hours.

For training purposes, NEPM, recoverable neutralizers are being developed. A target mine shape is required and a range support boat is required to recover the NEPM neutralizer.

Training Considerations
In most cases, these exercises are not conducted separately from the mine hunting phase of the operation.

MH-60S with Rapid Airborne Mine Clearance System (RAMICS) (AN/AWS-2)

RAMICS uses a 30 mm Bushmaster automatic cannon that fires super cavitating non-explosive, practice munition projectiles.

Basic Phase (Unit Level Training) Scenario
The helicopter flies to the area where the threat surface or near surface moored mines or shallow bottom mines have been previously located and uses its LIDAR system to locate and target the mines. The helicopter must position itself at a safe standoff distance from the threat mine that will be exploded, yet within its targeting and ballistic accuracy envelope. Typically, a 1,500-foot horizontal distance and a 45 to 60 degree field of fire from the helicopter to the mine can be used. LIDAR provides aiming coordinates to the RAMICS, which fires a 30 to 40-shot burst of special 30 mm super cavitating

10 AMNS uses a 3.24 lb NEW charge. AMNS events do not occur within current training, but are part of the proposed training.

projectiles at the mine and causes immediate and positive mine neutralization. The typical duration is 1.5 hours.

RAMICS uses a 30 mm Bushmaster automatic cannon that are to be fired at simulated threat mine shapes located within a training range facility.

Integrated and Sustainment Phase Training Scenarios
Not typically conducted in these phases.

Training Considerations
In most cases, these exercises are not conducted separately from the mine hunting phase of the operation.

Mine Neutralization-Explosive Ordnance Disposal (EOD)

Explosive Ordnance Disposal personnel use special equipment to evaluate threat mines, then small explosive charges to destroy the mine to create a safe channel for friendly shipping.

EOD Personnel with Mine Neutralization Charges

Basic Phase (Unit Level Training) Scenario
EOD personnel detect, identify, evaluate, and neutralize mines. The EOD mission is typically to locate and neutralize mines after they are initially located by another source, such as an MCM or MHC class ship or an MH-53 or MH-60 helicopter.

Once the mine shapes are located, EOD divers are deployed from a ship via Combat Rubber Raiding Craft (CRRC) to further evaluate and "neutralize" the mine. The neutralization of mines in the water is normally done with an explosive device and may involve detonation of 20 pounds of TNT equivalent. The initiation of the charge is positively controlled by EOD personnel.

Mine training shapes or other exercise support equipment and a range area that will support the use of HE ordnance is required for a 6 - 8 hour window. These operations are normally conducted during daylight hours for safety reasons.

Training Considerations
In most cases, these exercises are not conducted separately from the mine hunting phase of the operation.

Mine Warfare Planning Criteria
Figure D-1 (located in MCM section) presents the planning criteria for the various Mine Countermeasures and Mine Neutralization platforms to establish training areas to deploy mine shapes.

SURFACE WARFARE

BOMBING EXERCISE (BOMBEX [AIR-TO-SURFACE])

Strike fighter and maritime patrol aircraft deliver bombs against surface maritime targets, day or night, with the goal of destroying or disabling enemy ships or boats.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Bombing Exercise (BOMBEX) (Air-to-Surface)	F/A-18	MK-82/GBU-30/38 (500 lbs HE bomb)[11]	1 hour	58 events (232 bombs)
			1 hour	20 events (80 bombs)
		MK-83/GBU-32 (1,000 lb HE bomb)[12]	1 hour	23 events (92 bombs)
			1 hour	10 events (40 bombs)
		MK-84 (2,000 lb HE bomb)[13]	1 hour	8 events (8 bombs)
			1 hour	1 sortie (1 bomb)
		MK-20 (HE cluster bomb)[14]	1 hour	12 events (12 bombs)
		MK-20 (NEPM cluster bomb)	1 hour	13 events (51 bombs)
		MK-76 (25 lb NEPM)	1 hour	25 events (129 bombs)
		MK-82 (I), BDU-45 (500 lb NEPM)	1 hour	11 events (45 bombs)
		MK-83(I) (1,000 lb NEPM)	1 hour	None
	F/A-18, F-35 (Joint Strike Fighter [JSF])	BDU-33, GBU-12, JDAM, JSOW, MK-76, MK-82, MK-84 (all NEPM)	1 hour	70 events (70 bombs)

F/A-18C/E/F with Unguided or Precision-guided Munitions

Unguided munitions: MK-76 and BDU-45 (NEPM training bombs); MK-80 series (NEPM or HE); MK-20 Cluster Bomb (NEPM or HE).
Precision-guided munitions: Joint Direct Attack Munition (JDAM) (NEPM).

Basic Phase (Unit Level Training) Scenario
A flight of two aircraft will approach the target from an altitude of between 15,000 feet to less than 3,000 feet and, when on an established range, will adhere to designated ingress and egress routes. Typical bomb release altitude is below 3,000 feet and within a range of 1,000 yards for unguided munitions, and above 15,000 feet and in excess of 10 nm for precision-guided munitions. Exercises at night are normally done with captive carry (no drop) weapons because of safety considerations. Laser designators from participating aircraft, support aircraft, or ground support personnel are used to illuminate certified targets for use with lasers when using laser guided weapons. The typical sortie duration is 1 hour.

Integrated and Sustainment Phase Training Scenarios
Typically involves an at-sea simulated strike scenario with a flight of four or more aircraft, with or without a designated opposition force (OPFOR).

11 Assumes 4 MK-82 bombs per sortie, and 1 GBU-30/38 Joint Direct Attack Munitions (JDAM) bomb per sortie.
12 Assumes 4 MK-83 bombs per sortie and 1 GBU-30/38 JDAM bomb per sortie.
13 Assumes 1 bomb per sortie.
14 Assumes 1 bomb per sortie.

Training Considerations
Strike fighter pilots can fulfill this training requirement against either a land or water target. It rarely involves dropping HE ordnance in the open ocean.
Unguided munitions: Usually conducted at land ranges with NEPM or HE ordnance, or water ranges with grounded ship hulks available for targets. MK-76 and BDU-48 NEPM bombs are the most common weapon allocation.
Precision-guided munitions: The very large safety footprints of these bombs limit their employment to impact areas on large land ranges, such as the Fallon Training Range Complex, or at-sea during a SINKEX. Each squadron's training allowance is very small (only one or two per year), severely limiting the total fleet-wide annual expenditure of these weapons.

P-3C and P-8A Maritime Patrol Aircraft (MPA) with Unguided Munitions
Unguided munitions: BDU-45 NEPM bomb; MK-82 (500 lb bomb) (NEPM or HE); MK-20 (Rockeye cluster bomb) (NEPM or HE).

Basic Phase (Unit Level Training) Scenario
MPA use bombs to attack surfaced submarines and surface craft that would not present a major threat to the MPA itself. The MPA is larger and slower than an F/A-18, so its bombing tactics differ markedly. A single MPA approaches the target at a low altitude. In most training exercises, it drops NEPM training munitions, such as the BDU-45 on a MK-58 smoke float used as the target. The typical sortie duration is 1 hour.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario, except that a more realistic target may be available and HE ordnance may be expended, such as during a SINKEX.

Training Considerations
MPA pilots can fulfill this training requirement against either a land or water target, but it is usually conducted within the Warning Area above a water range with NEPM ordnance against MK-58 smoke as the target.

The annual ordnance expenditure allocation typically authorizes only a very limited number of HE munitions. This Commander Naval Air Force allocation should be reviewed if a specific number of HE weapons are needed for a specific requirement.

MISSILE EXERCISE (AIR-TO-SURFACE) (MISSILEX (A-S))

Fixed winged aircraft and helicopter crews launch missiles at surface maritime targets, day and night, with the goal of destroying or disabling enemy ships or boats.

Operation	Platform	System/ Ordnance	Event Duration	Number of Events
Missile Exercise (MISSILEX) (Air to Surface)	MH-60R/S, HH-60H[15]	AGM-114 Hellfire (HE)	1 hour	30 sorties (30 missiles)
	F/A-18, P-3C, and P-8A[16]	AGM-65 Maverick (HE)	1 hour	20 sorties (20 missiles)
	F/A-18, F-35 (JSF), H-60	AGM-114 Hellfire, AGM-88 HARM, AGM-65 LSR Maverick, AGM-84 Harpoon[17]	1 hour	21 sorties (21 missiles)

HH-60H, & MH-60S Helicopters with Hellfire Missiles

Basic Phase (Unit Level Training) Scenario
One or two helicopters approach and acquire an at-sea surface target, which is then designated with a laser to guide the Hellfire to the target. The laser designator may be onboard the helicopter firing the Hellfire, another helicopter, or another source. The helicopter launches a missile from an altitude of about 300 feet against a specially prepared target with an expendable target area on a non-expendable platform. The missile passes through the expendable target without damaging the platform and explodes approximately 10-20 feet above the surface of the water. The platform fitted with the expendable target could be a stationary barge, a remote controlled speed boat, or a jet ski towing a trimaran. The typical sortie duration is 1 hour.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario.

Training Considerations
In the last several years, the Navy has had very few NEPM Hellfire missiles in its inventory, which has required the expenditure of HE Hellfire missiles during training exercises. As a result, training shots have been limited to minimum qualification vice proficiency.

F/A-18C/E/F Aircraft with Maverick

Basic Phase (Unit Level Training) Scenario
A flight of two aircraft approach an at-sea surface target from an altitude between 25,000 feet and 5,000 feet for Maverick, complete the internal targeting process, and launch the weapon at the target from beyond 12 nm for Maverick. The majority of unit level exercises involve the use of captive carry (NEPM, no release) training missiles; the aircraft perform all detection, tracking, and targeting requirements without actually releasing a missile. For HE Maverick missiles, detonation occurs at the water's surface. The typical sortie duration is 1 hour.

15 Target: Improved Surface Towed Target (ISTT), which is a laser target on a barge.
16 The P-8A is the replacement platform for the P-3C; event uses ISTT.
17 100% NEPM, except Hellfire, and an occasional test will use an HE round.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario, except that an E-2 aircraft may participate to assist with targeting procedures and command and control of several sections (four or more) of F/A-18s.

Training Considerations
Because of the expense and large safety footprints, the Navy launches very few HE missiles per year, land or sea. The typical annual allocation is one Maverick per squadron fired with the principal objective of end-to-end tests. Maverick may be fired at sea or at the Fallon Range Training Complex. When fired at sea, the missiles will normally be fired at a decommissioned ship during a sinking exercise (SINKEX).

P-3C and P-8 Aircraft with Harpoon or Maverick

Basic Phase (Unit Level Training) Scenario
Typically one aircraft will approach the at-sea surface target, from an altitude between 40,000 feet and 25,000 feet for Harpoon and between 25,000 feet and 5,000 feet for Maverick, complete the internal targeting process, and launch the weapon at the target from beyond 12 nm for Harpoon or Maverick. The majority of unit level exercises involve the use of captive carry (NEPM, no release) training missiles; the aircraft perform all detection, tracking, and targeting requirements without actually releasing a missile. For HE Maverick missiles, detonation occurs at the water's surface. The typical sortie duration is 1 hour.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario, except that HE ordnance may be expended against a realistic target.

Training Considerations
Because of the expense and large safety footprints, the Navy launches very few HE missiles per year. The typical annual allocation is one Harpoon and one Maverick per squadron fired with the principal objective of end-to-end tests. Harpoon and Maverick are currently only fired at sea at a decommissioned ship during a SINKEX.

GUNNERY EXERCISE (AIR-TO-SURFACE) (GUNEX (A-S))

Strike fighter aircraft and helicopter crews, including embarked NSW personnel use guns to attack surface maritime targets, day or night, with the goal of destroying or disabling enemy ships, boats, or floating or near-surface mines.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Gunnery Exercise (GUNEX) (Air-to-Surface)[18]	MH-53E	.50 cal machine gun	1 hour	24 sorties (48,000 rounds)
	MH-60S	2.75 in rockets	1 hour	None
		.50 cal machine gun	1 hour	200 sorties (161,280 rounds)
		M-240 (7.62 mm machine gun)	1 hour	100 sorties (161,280 rounds)
	F/A-18, F-35 (JSF)	20 mm cannon (NEPM)	1 hour	10 sorties (6,000 rounds)

MH-60R/S Helicopters with Side Door-Mounted .50 cal and 7.62 mm Machine Guns

Basic Phase (Unit Level Training) Scenario
A single helicopter typically carries several air crewmen needing gunnery training. The aircraft flies various gunnery patterns around the sea target at approximately 300 ft AGL. Initial qualifications require gunners to expend 400 rounds of .50 cal and/or 800 rounds of 7.62 mm ordnance in each exercise. The target is normally a non-instrumented floating object such as an expendable smoke float, steel drum, or cardboard box, but may be a remote controlled speed boat or jet-ski type target. Gunners will shoot special target areas or at towed targets when using a remote controlled target to avoid damaging them. The exercise lasts about 1 hour.

Integrated and Sustainment Phase Training Scenarios
Re-qualification requires each gunner to expend 200 .50 cal rounds and/or 400 7.62 mm rounds of ordnance.

Training Considerations
MH-60S helicopters have a mission to support NSW operations, so they will also train with embarked NSW personnel. NSW personnel use .50 cal and 7.62 mm during this exercise.

18 Targets are MK-58 Marine Markers (smoke floats); F/A-18, F-35 (JSF) RDT&E only.

GUNNERY EXERCISE (SURFACE-TO-SURFACE) –BOAT (GUNEX (S-S) - BOAT)

A Navy small boat uses a machine gun to attack and disable or destroy a surface target that simulates another ship, boat, swimmer, floating mine, or near shore land targets.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
GUNEX (Surface-to-Surface) (Boat)	Small Unit River Craft, Combat Rubber Raiding Craft, Rigid Hull Inflatable Boats, Patrol Craft, etc.[19]	.50 cal, 7.62 mm	1 hour	32 events (200,000 small caliber rounds)
		40 mm grenades	1 hour	32 events (540 rounds)

A number of different types of boats are used depending on the unit using the boat and their mission. Boats are most used by NSW teams and Navy Expeditionary Combat Command (NECC) units (Naval Coastal Warfare, Inshore Boat Units, Mobile Security Detachments, Explosive Ordnance Disposal, and Riverine Forces). These units are used to protect ships in harbors and high value units, such as aircraft carriers, nuclear submarines, liquid natural gas tankers, *etc*., while entering and leaving ports, as well as to conduct riverine operations, insertion and extractions, and various naval special warfare operations.

The boats used by these units include: Small Unit River Craft (SURC), Combat Rubber Raiding Craft (CRRC), Rigid Hull Inflatable Boats (RHIB), Patrol Craft, and many other versions of these types of boats. These boats use inboard or outboard, diesel or gasoline engines with either propeller or water jet propulsion.

Navy Boats with .50 cal, 7.62 mm or 40 mm grenades

This exercise is usually a live fire exercise, but at times blanks may be used so boat crews can practice their ship-handling skills for the employment of weapons without being concerned with the safety requirements involved with bullet travel or HE weapons.

Basic Phase (Unit Level Training) Scenario

Boat crews may use high or low speeds to approach and engage targets simulating other boats, swimmers, floating mines, or near shore land targets with .50 cal, 7.62 mm, or 40 mm machine guns (about 200, 800, and 10 rounds, respectively). The most common exercise target is a 50-gallon steel drum that is expended during the exercise and not recovered. Some ranges have ship hulk targets or target silhouettes alongside river banks to provide more realistic training opportunities depending on assigned missions. The typical event duration is 1 hour.

Integrated and Sustainment Phase Training Scenarios

Typically do not differ from the Basic Phase Scenario, except for the additional command and control coordination involved.

Training Considerations

The purpose of this exercise is to develop marksmanship skills and small boat ship-handling tactics skills required to employ these weapons. It usually lasts 1 hour.

19 Navy Special Warfare Small Boat Teams or other local maritime security units.

GUNNERY EXERCISE (SURFACE-TO-SURFACE)-SHIP (GUNEX (S-S) – SHIP)

Ship gun crews engage surface targets at sea with their main battery 5-inch and 76 mm guns as well as smaller surface targets with 25 mm, .50 cal, or 7.62 mm machine guns with the goal of disabling or destroying the threat ship.

Operation	Platform	System/ Ordnance	Event Duration	Number of Events
GUNEX (Surface-to-Surface) (Ship)[20]	CG, DDG[21]	5" gun (NEPM)	3 hours	104 events (2,211 rounds)
	FFG[22]	76 mm gun (NEPM)	3 hours	20 events (335 rounds)
	CG, DDG, FFG, LHA, LHD, LPD, LSD[23]	.50 cal machine gun	3 hours	108 events (237,600 rounds)
		25 mm machine gun	3 hours	108 events (124,800 rounds)

CG and DDG with 5-inch and FFG with 76 mm Guns

There are three types of main battery shipboard guns currently in use: 5-inch/54 (CG and DDG), 5-inch/62 (DDG-81 and newer), and 76 mm (FFGs). Both 5-inch guns use the same types of 5-inch projectiles for training exercises. The difference between the 5-inch guns is the longer range of the 5-inch/62 because of the larger powder propulsion charge.

Basic Phase (Unit Level Training) Scenario

A slow (5 kts) or high (30 kts) speed simulated enemy ship or boat approaches the CG/DDG/FFG from about 10 nm, is detected by the ship's radar and determined to be hostile. The target is tracked by radar, and when it is within 5 - 9 nm, it is engaged by approximately 60 rounds of 5-inch or 76 mm, fired with an offset so as not to actually hit the targets. The event is conducted over a period of about 3 hours. Live or NEPM training rounds may be used. After impacting the water, the HE rounds are expected to detonate within 3 feet of the surface. NEPM rounds and fragments from the HE rounds will sink to the bottom of the ocean.

The main battery guns have a requirement to attack high-speed, maneuvering, towed or remotely controlled surface targets such as the QST-35 Seaborne Powered Target (SEPTAR), High Speed Maneuverable Surface Target (HSMST), or a remote controlled Jet Ski.

Integrated and Sustainment Phase Training Scenarios

20 CG: Cruiser; DDG: Guided Missile Destroyer; FFG Guided Missile Frigate; LHA: Amphibious Assault Ship, general purpose; LHD: Multipurpose Amphibious Assault Ship; LPD: Amphibious Assault Ship, Transport Dock; LSD: Dock Landing Ship; all rounds are NEPM.

21 Targets vary depending on training event: High speed Maneuvering Surface Target (HSMST), MK-33 SEPTAR, trimaran or radar reflective surface balloon (killer tomato).

22 Targets vary depending on training event: HSMST or killer tomato.

23 Targets: 55 gallon drum, balloon (weather, Mylar, or target), or Floating At-Sea Target (FAST).

These two scenarios will be similar to each other and the Basic Phase Scenario, but will have more "friendly" ships (3 to 5) participating. Additional ships will increase the number of rounds fired proportionally.

LHA, LHD, LPD, and LSD with 25 mm, .50 cal or 7.62 mm Machine Guns and CG, DDG, FFG, and CVN with .50 cal or 7.62 mm Machine Guns

While main battery guns are designed for both offensive and defensive use against larger, ship-sized targets, these smaller caliber machine guns are designed to provide close range defense against patrol boats, smaller boats, swimmers, and floating mines.

Amphibious ships, such as LHA, LHD, LPD, and LSD use 25 mm machine guns as their principal gun to provide a defensive gunfire capability for the engagement of a variety of smaller surface targets. Most of these amphibious ships, as well as the CG, DDG, FFG, and CVN, are also equipped with 25mm, .50 cal or 7.62 mm machine guns.

Basic Phase (Unit Level Training) Scenario

Ships use machine guns to practice defensive marksmanship, typically against stationary floating targets. Targets are engaged after closing the target to within about 2,000 yards for 25 mm, 900 yards for .50 cal, and 400 yards for 7.62 mm; between 200 and 800 rounds are typically expended.

The target is typically a Floating At-Sea Target (a 10-foot diameter red balloon tethered by a sea anchor, also known as a "Killer Tomato"), a 50-gallon steel drum, or other available target, such as a cardboard box. Targets are expended during the exercise and are not recovered. The event is conducted over a period of about 3 hours.

Integrated and Sustainment Phase Training Scenarios

Typically do not differ from the Basic Phase Scenario.

LASER TARGETING

Ground personnel, such as NSW teams and fixed-winged aircraft or helicopters use lasers to illuminate/designate enemy targets for destruction by the aircraft with laser guided bombs or missiles. As previously mentioned, the events which occurred at the Navy Dare County Bombing Range and Stumpy Point Ranges are not analyzed in this EIS/OEIS.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Laser Targeting[24]	F/A-18	Maverick Laser Fire Control System	1 hour	124 sorties
	MH-60R/S	Hellfire Laser Fire Control System	1 hour	124 sorties

MH-60R/S with Hellfire Laser Fire Control System; F/A-18C/E/F with Maverick Laser Fire Control System

This exercise is documented for aircraft when only the laser component of the exercise is conducted. It would be conducted in the same manner as if the aircraft was performing the supporting role as a laser designator or if the aircraft was dropping the weapon itself. If an actual HE, NEPM, or captive carry bomb or missile is used, then the exercise is documented as a BOMBEX or MISSILEX and may be either A-S or A-G depending in where the exercise is conducted. Laser designators from participating aircraft are used to illuminate certified targets for use with lasers as they would be when using laser guided weapons.

Basic Phase (Unit Level Training) Scenario
See BOMBEX (A-G) or (A-S) and MISSILEX (A-G) or (A-S). The sortie duration is typically 1 hour.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario.

24 This is a non-firing Missile Exercise (Surface-to-Air). Aircrews perform all procedures for missile deployment short of launching the missile, including acquiring and designating target with laser.

VISIT BOARD SEARCH & SEIZURE / MILITARY INTERDICTION OPERATIONS

Helicopters and surface ships deliver boarding parties to suspect surface vessels to inspect and examine the vessel's papers or examine it for compliance with applicable resolutions or sanctions. Seizure of the vessel (that is confiscating or taking legal possession of the vessel and contraband (goods or people)) could result, if the vessel is found in violation of any applicable resolutions or sanctions.

Operation	Platform	System / Ordnance	Event Duration	Number of Events/Sorties
Visit Board Search & Seizure / Military Interdiction Operations (VBSS/MIO) – Ship[25]	Rigid Hull Inflatable Boat (RHIB) or similar small boat, and CG, DDG, FFG, LPD or LSD	N/A	2-3 hours	84 events
VBSS/MIO-Helicopter[26]	H-60	N/A	1.5 hours	40 sorties

VISIT BOARD SEARCH & SEIZURE / MILITARY INTERDICTION OPERATIONS (VBSS/MIO) – SHIP

CG, DDG, FFG, LPD, LSD with Shipboard or Naval Special Warfare (NSW) Boarding Teams with Small Arms

Basic Phase (Unit Level Training) Scenario

VBSS/MIO events are examples of Maritime Security (MS) Operations training and involve helicopters and/or surface ships, traveling at speeds 20 knots or more, and intercepting/disrupting potentially illegal activities in littoral areas or on the high seas. When a suspect vessel is sighted, the ship will approach the suspect vessel at a speed of 20 knots or more while preparing to launch its organic helicopter or small boat. Smaller craft launched surfaces may also travel at higher speeds (20-40 knots). An organic helicopter and small boat may also be used to board the suspect vessel, but shipboard or Naval Special Warfare boarding teams with armed force may be required to make the boarding. Small arms with inert blanks may be used. The entire exercise may last 2 to 3 hours.

Training Considerations

A range support vessel or other commercial style vessel can be used as the suspect vessel to be boarded and may be staffed with opposing forces to create a better training environment.

25 Each ship must conduct one VBSS/MIO every six months. Target vessel is typically another strike group ship or Mobile Sea Range (MSR) vessel such as Prevail.

26 These are ULT & major exercise events. Naval Special Warfare (NSW) personnel perform fast-rope onto target vessel from the first helicopter. A second helicopter flies close cover. A third helicopter flies surveillance.

VISIT BOARD SEARCH & SEIZURE / MILITARY INTERDICTION OPERATIONS (VBSS/MIO) – HELICOPTER

SH-60B/F, HH-60H, MH-60R/S with Machine Guns and Shipboard or NSW Boarding Teams with Small Arms

Basic Phase (Unit Level Training) Scenario

Helicopters supply the transportation for the boarding party from a surface ship to the suspect vessel to be boarded, as described above, and provide added fire power from onboard 7.62 mm or .50 Cal machine guns (see GUNEX (A-S)) if required in an uncooperative mission. The helicopter will approach the suspect vessel, use an appropriate insertion/extraction method (see Insertion/Extraction - HELO) for the tactical situation to place the boarding party on the suspect vessel, and then standby in a hover or close proximity flight pattern to provide armed support as required. Despite the notional description provided herein, in the VACAPES Range Complex this is a non-firing event. The typical event duration is 1.5 hours.

Training Considerations

A range support vessel or other commercial style vessel can be used as the suspect vessel to be boarded and may be staffed with opposing forces to create a better training environment.

ANTI-SUBMARINE WARFARE

NOTE: All anti-submarine warfare descriptions are found in the Atlantic Fleet Active Sonar EIS/OEIS.

AIR WARFARE OPERATIONS

AIR COMBAT MANEUVER (ACM)

Strike fighter aircraft perform intricate flight maneuvers to achieve a gun or missile firing position from which an attack can be made on a threat aircraft with the goal of destroying the adversary aircraft.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Air Combat Maneuver (ACM)	F/A-18[27]	CATM-9, TACTS pod	1 hour	5,264 sorties

ACM is the general term used to describe an Air-to-Air (A-A) event involving two or more aircraft. These aircraft may be similar or dissimilar. Aircraft are considered similar if they are of the same aircraft type and model. For example, an F/A-18C is similar to an F/A-18E, whereas an F/A-18 and an F-15 are dissimilar.

Unit Level ACM training consists of three levels: Basic Fighter Maneuvering (BFM), intermediate level Offensive Counter Air (OCA), and Defensive Counter Air (DCA) training. No HE-weapons are fired during ACM operations.

BFM. During BFM, two aircraft (one versus one) will engage in offensive and defensive maneuvering against each other.

OCA and DCA. During OCA or DCA training, three or more aircraft (one versus two, two versus two, two versus three, or three versus one) will engage in offensive and defensive maneuvering. Participating aircraft will be separated at the start by distances up to 50 nm. During OCA training, a force of two or more aircraft will attempt to establish and maintain air superiority over a defined battle space by defeating a force of defending aircraft. During DCA training, a force of two or more aircraft will attempt to retain air superiority over a defined battle space by defeating a force of aggressor aircraft. Unit level OCA and DCA training, which is a precursor to joint and combined integrated range operations, involves high airspeeds (from high subsonic to supersonic) and rapidly changing aircraft altitudes and attitudes.

F/A-18C/E/F and EA-18G with Captive Carry Training Missiles (CATM-9)

Basic Phase (Unit Level Training) Scenario
Typically two aircraft, operating from 5,000 to 30,000 feet, begin their maneuvers from a separation distance of 2 to 3 nm and, throughout an "engagement," will normally not separate beyond visual range (6 to 8 nm). Aircraft airspeeds will range from very low (less than 100 kts) to high subsonic (less than 600 kts). Their maneuvers will be continuous proactive and reactive changes in aircraft attitude, altitude, and airspeed to gain advantage over the adversary aircraft, resulting in its simulated destruction from guns or missiles. The typical sortie duration is 1 hour.

This scenario builds through several basic levels as the pilot becomes more experienced and will include:
- Defensive fighter maneuvers - one versus one adversary is described above
- High aspect fighter maneuvers - one versus one adversary that starts from a offensive, defensive or neutral position
- Dissimilar fighter maneuvers - one versus one adversary of a different type of adversary aircraft
- Section fighter maneuvers - two versus one adversary or more.

27 100% captive carry (no ordnance launched).

Integrated and Sustainment Phase Training Scenarios
Typically not conducted during these phases, as these scenarios do not normally have adversary aircraft operating within visual range of friendly aircraft.

Training Considerations
The preferred ACM training location is within a Warning Area or Restricted Airspace. These airspaces are designed to keep other aircraft clear of the area where military aircraft are conducting operations and thereby allow safe operations. The aircraft conducting ACM are often augmented with telemetry systems that document the exact location of each aircraft so that the tactics used by each aircraft may be reviewed and assessed from a training perspective. The CATM-9, captive carry air training missile, is installed on an aircraft where a "real" missile would be installed and allows the aircraft's "weapon system" to operate as if a "real" missile was installed. The CATM-9 is "captive", so it always stays connected to the aircraft.

GUNNERY EXERCISE (AIR-TO-AIR) (GUNEX (A-A))

Strike fighter aircraft attack a simulated threat target aircraft with its cannon (machine gun) with the goal of destroying the other aircraft.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
GUNEX (Air-to-Air)	F/A-18[28]	20 mm cannon	1 hour	54 sorties (13,500 rounds)

F/A-18C/E/F with Vulcan M61A1/A2 20 mm Cannon

Basic Phase (Unit Level Training) Scenario
A flight of two aircraft operating well above 3,000 feet will approach a target from several miles away and when within 6,000 feet can open fire. Approximately 250 rounds of 20 mm ammunition are expended against the target in bursts of about 30 rounds for each of about eight attacks on the target. Attacks are made from various aspects, such as from above, below, or level with the target, until all the allotted rounds have been expended.

A banner target is normally towed by a commercially contracted aircraft, such as a Lear jet, but may be towed by an unmanned aerial target drone (BQM-34 and BQM-74). The banner is recovered and if target drones are used, they deploy a parachute, float on the surface of the water, and are recovered by boat. The exercise is usually conducted above 3,000 feet, outside of 12 nm, if conducted at sea, and lasts about 1 hour.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario.

28 Live fire against towed banner.

MISSILE EXERCISE (AIR-TO-AIR) (MISSILEX (A-A))

Strike fighter aircraft attack a simulated threat target aircraft with its air-to-air missile with the goal of destroying the other aircraft.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
MISSILEX (Air-to-Air)	F/A-18[29]	AIM-7, Sea Sparrow (NEPM)	1 hour	47 sorties (47 missiles)
		AIM-9 Sidewinder (HE)	1 hour	48 sorties (48 HE missiles)
		AIM-120 AMRAAM (NEPM)	1 hour	48 sorties (48 missiles)
	F/A-18, F-35 (JSF)[30]	AIM-7, AIM-9, AIM-120, AIM-132 (ASRAAM)	1 hour	30 sorties (30 missiles)

F/A-18 or F-35 with AIM-7 Sparrow; AIM-9 Sidewinder; AIM-120 (AMRAAM); or AIM-132 (ASRAAM) (Live or Captive Carry)

Basic Phase (Unit Level Training) Scenario
A flight of two aircraft operating between 15,000 to 25,000 feet and at a speed of about 450 kts will approach a target from several miles away and, when within missile range, will launch its missile against the target. Approximately half of the missiles have HE warheads and about half have an NEPM telemetry head package. The missiles fired are not recovered.

The target is an unmanned aerial target drone (BQM-34; BQM-74) or Tactical Air-Launched Decoy (TALD). BQM targets deploy parachutes, float on the surface of the water, and are recovered by boat. TALDs are expended. The exercise lasts about 1 hour. It is conducted in a Warning Area at sea outside of 12 nm and well above 3,000 feet.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario.

29 In VACAPES, the event uses drone targets (BQM-74E) launched from FTC Dam Neck (~33%) or Tactical Air Launched Decoy (TALD) (~67%). Missiles are 30% HE and 70% NEPM.
30 Training flights; uses drone targets (BQM-34, BQM-74, or Coyote) launched from NASA Wallops Island.

GUNNERY EXERCISE (SURFACE-TO-AIR) (GUNEX (S-A))

Ship gun crews engage threat aircraft or missile targets with their guns with the goal of disabling or destroying the threat.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
GUNEX (Surface-to-Air)[31]	CG, DDG	5" gun (NEPM)	2 hours	13 events (264 rounds)
	FFG	76 mm gun (NEPM)	2 hours	3 events (72 rounds)
	CG, DDG, FFG, CVN[32], LHA, LHD, LPD, LSD	20 mm Close-in Weapons System (CIWS)	2 hours	27 events (57,400 rounds)

CG, DDG with 5-inch or FFG with 76 mm Main Battery Guns

Basic Phase (Unit Level Training) Scenario
A simulated threat aircraft or anti-ship missile is detected by the ship's radar at about 10 nm at an altitude below 3,000 feet, a speed between 250 and 500 kts, and heading toward the ship. Main battery guns are manned and 5-inch or 76 mm rounds are fired at the threat with the goal of destroying the threat before it reaches the ship. This is a defensive exercise where about six rounds of 5-inch Variable Timed, Non-Fragmentation (VTNF) ammunition and 12 rounds of 76 mm ammunition per gun mount are fired at a target tow by a commercial air services Lear jet. The ship will maneuver to unmask its guns but will typically operate at 10 to 12 kts or less during the exercise. The exercise lasts about 2 hours which normally includes several non-firing tracking runs followed by one or more the firing runs. The target must maintain an altitude above 500 feet for safety reasons and is not destroyed during the exercise.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario.

CG, DDG, FFG, CVN, LCC, LHA, LHD, LPD, LSD with 20 mm Close-in-Weapon System (CIWS)
The ordnance used is the 20 mm NEPM, ball ammunition made of tungsten, which has been replacing the former depleted uranium rounds.

Basic Phase (Unit Level Training) Scenario
The scenario for this exercise is the same as for the main battery gun exercise above, but the ships involved engage the simulated threat aircraft or missile with the CIWS. CIWS ships can expend between 900 to 1400 rounds per mount per firing run for a total of up to five runs during the typical 2-hour exercise. The actual number of rounds expended during this exercise is dependent on the ship class, the CIWS model installed, and the available ammunition allowance. Ships with 5-inch or 76 mm guns may conduct this exercise immediately before or after the main battery gun exercise.

There is also a Preventive Maintenance requirement to test fire CIWS prior to this exercise, called a Pre-action calibration firing (PACFIRE). A PACFIRE generally expends about 30 rounds per firing mount.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario.

31 Exercise uses towed banner targets.
32 Aircraft Carrier, nuclear.

MISSILE EXERCISE (SURFACE-TO-AIR) (MISSILEX (S-A))

Surface ships engage threat missiles and aircraft with missiles with the goal of disabling or destroying the threat.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
MISSILEX (Surface-to-Air)[33]	AOE[34], LHD, CVN	NATO Sea Sparrow	2 hours	30 events
	CG, LHA, AOE	Evolved NATO Sea Sparrow	2 hours	
	CVN, FFG, LHA, LHD, LSD, LPD	Rolling Airframe Missile	2 hours	
	CG, DDG	SM-2	2 hours	

There is a training restriction on firing Surface-to-Air missiles from all surface ships, except aircraft carriers (CVN). Surface-to-Air missiles are typically fired for a RDT&E purposes.

CVN, CG, DDG, FFG, LHA, LHD, LSD, LPD with Point Defense Missiles

Point defense missiles are designed to defend the ships on which they are installed. These missiles are installed on various surface ships and are not inclusive in every class (the specific ship, by name, must be identified to determine what, if any, point defense missile system is installed):

- NATO Sea Sparrow - may be installed on LHD, CVN
- Evolved NATO Sea Sparrow, scheduled to replace NATO Sea Sparrow - may be installed on CG, LHA
- Rolling Airframe Missile - may be installed on CVN, FFG, LHA, LHD, LSD, LPD

Basic Phase (Unit Level Training) Scenario

The scenario for this exercise is the same as for the main battery gun exercise above, but the simulated threat missile is engaged with the point defense missile system. One HE or telemetered-NEPM-missile is expended against a target towed by a commercial air services Lear jet after two or three tracking runs. The exercise lasts about 2 hours.

The BQM-74 target, sometimes augmented with a target detection unit (TDU), is used as an alternate target for this exercise. The BQM target is a subscale, subsonic, remote controlled ground or air launched target. A parachute deploys at the end of target flight to enable recovery at sea.

Training Considerations

The CVN is the only ship to have a documented training requirement with an actual missile shot. All other surface ships conduct the "detect to engage exercise," as there is no longer a training requirement for these ships to fire HE or NEPM missiles.

CG, DDG with Standard Missile (SM-2)

CGs and DDGs use the Standard Missile (SM-2) to defend the force against threat missiles and aircraft. These ships are tactically stationed to defend the aircraft carrier, amphibious ships, or logistic ships of the force, as well as themselves, from the air threat.

33 NAVAIR launches drones (subsonic BQM-34/74 and supersonic Coyote) out of Goddard Flight Facility, NASA Wallops Island to support tests.
34 Fast Combat Support Ship.

Basic Phase (Unit Level Training) Scenario
The scenario for this exercise is the same as for the main battery gun exercise above, but the simulated threat missile is engaged with the Standard Missile system. One HE or telemetered-NEPM-missile is expended against a target towed by a commercial air services Lear jet after two or three tracking runs. The exercise lasts about 2 hours.

The BQM-74 target, sometimes augmented with a TDU, is used an alternate target for this exercise. The BQM target is a subscale, subsonic, remote controlled ground or air launched target. A parachute deploys at the end of target flight to enable recovery at sea.

Training Considerations
The "detect to engage exercise" is used to conduct this training, as there is no longer a training requirement for these ships to fire HE or NEPM missiles.

AIR INTERCEPT CONTROL (AIC)

Surface ships and fixed winged aircraft use their air search radar capability to direct strike fighter aircraft toward threat aircraft where the threat aircraft may be engaged and destroyed by the strike fighter's missiles or guns.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Air Intercept Control[35]	F/A-18, E-2C, CVN, CG, DDG, LHA, LHD	Air Search and Fire Control Radars	1-2 hours	366 events

CVN, CG, DDG, LHA, LHD, F/A-18, E-2C with Air Search and Fire Control Radar

Basic Phase (Unit Level Training) Scenario
The goal of the AIC exercise is the training of both the controllers and the aircraft pilots to intercept and simulate destruction of an opposing aircraft with its own force aircraft using either the aircraft's missile or gun systems.

Air intercept controllers embarked in aircraft and ship platforms, and sometimes in Navy school houses, use air search radars to track both the friendly strike fighter interceptor and the threat aircraft at altitudes typically well above 15,000 feet. Friendly and threat aircraft may be 100 nm apart at the start of this exercise. When the threat aircraft is detected by the controller's air search radar, a course and speed is provided to the strike fighter to intercept and engage the threat aircraft. Speeds in excess of 450 kts may be used. No HE ordnance is used, but captive carry missiles may be used when strike fighters participate, and thereby complete MISSILEX (A-A) or GUNEX (A-A) exercises. Several intercepts are usually conducted over 1-2 hours.

Fleet aircraft often are not available for this training, so commercial air services aircraft are often used to provide the level of training required by controllers.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario, except that two to four interceptors may be directed toward larger numbers of threat aircraft.

35 Unit level training only (ULT); Commercial Air Services (CAS) provides intercept or threat aircraft or both.

DETECT-TO-ENGAGE

Shipboard personnel use all shipboard sensors (search and fire control radars and Electronic Support Measures (ESM)) in the entire process of detecting, classifying, and tracking enemy aircraft and/or missiles up to the point of engagement, with the goal of destroying the threat before it can damage the ship.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Detect-to-Engage[36]	CG, DDG, FFG, LHA, LHD, LPD, LSD, CVN	Air search and fire control radars	1.5 hours	204 events

CVN, CG, DDG, FFG. LHA, LHD, LPD, LSD with Shipboard Search and Fire Control Radars, ESM Equipment, and Weapon Systems

Basic Phase (Unit Level Training) Scenario
Shipboard systems are manned at a specified condition of readiness that may range from a routine watch organization, where only essential systems are manned, all the way to general quarters, where every system is manned for full battle. System operators may or may not be alerted that the ship may come under "attack" so that a more realistic response will be achieved.

A simulated threat aircraft will approach the ship from more than 20 nm and may be expected to approach from well above 3,000 ft to just a few hundred feet above the water, and from 250 kts to supersonic in order to provide a wide range of threat profiles.

Once the ship has detected the threat aircraft, operators and watch teams use all of their capabilities to evaluate and track the threat and man and engage the required weapons systems to protect the ship.

A live air target, such as a commercial air service Lear Jet, is the principal external component for this exercise, but Fleet aircraft may also be used. This exercise may also be conducted in conjunction with additional ships. When additional ships are available, additional training may be achieved through the exchange of Link-16 data and voice communication reporting. The typical event duration is 1.5 hours.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario for the individual ship, except that more air threats will be present and may attack the ship from different directions at the same time.

An additional level of complexity is added during these scenarios from the reporting and coordination aspects between ships in the Strike Group, as specific ships are typically responsible for assigned areas around the Strike Group. Aircraft detected in these assigned areas are reported to all ships in the Strike Group and as the threat aircraft continues its approach, the assigned ship will report the engagement and destruction of the threat, or warning that the threat was not destroyed and that it needs to be engaged by another ship.

Additional levels of AW complexity are added in other exercises, such as the war-at-sea exercise (WASEX) where ship and aircraft of the Strike Group are coordinated by an AW Commander.

36 ULT only. CAS to provide threat aircraft or simulated missile.

STRIKE WARFARE

HIGH-SPEED ANTI-RADIATION MISSILE EXERCISE (HARMEX)

Strike fighter and electronic attack aircraft use sensors to detect radar signals from a simulated threat radar site and either simulate or actually launch an NEPM or HE HARM with the goal of destroying or disabling the threat radar site.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
HARM Missile Exercise (HARMEX)	F/A-18[37]	AGM-88 HARM (HE)	1 hour	26 sorties (26 missiles)

A HARMEX scenario may require the launching aircraft to employ the missile either offensively or defensively. In the offensive role, the HARM is employed against an electronic emitter (either actual threat radar equipment or a threat simulator) during a Suppression of Enemy Air Defenses (SEAD) mission. The HARM aircraft precedes the strike group, "baiting" the enemy's Integrated Air Defense System (IADS) to radiate its radar, so these threat weapons systems can be engaged and destroyed by HARM. In the defensive role, HARM is employed reactively and spontaneously against a previously unidentified emitter that poses an immediate threat to the strike group or launching aircraft.

F/A-18C/E/F with HARM (AGM-88)

Basic Phase (Unit Level Training) Scenario
Two to four aircraft approach the threat radar site at an altitude well above 3,000 feet. With a range greater than 57 nm, HARM allows the launching aircraft to stay outside the range of many antiaircraft weapons that may be defending the threat radar site. Once the target is located with onboard sensors, the HARM is launched against an active radar emission.

This training operation normally uses a captive carry training missile on a range equipped with a variety of electronic threat emitters suitable for the real world anticipated threat, as HARM is a "launch and leave" weapon. This characteristic and the resulting inability of the launch aircraft to alter the missile's flight path after launch reduce the requirement for NEPM or HE ordnance expenditures, although they may be expended against specially configured barges in OPAREAs at sea outside of 12 nm. The typical sortie duration is 1 hour.

The at-sea target is typically a barge that is towed to the OPAREA by a tug or range boat, set adrift, then recovered after the exercise and returned to port. The barge has a tower with an electronic emitter that the HARM will seek when it has been fired from the launch aircraft. The NEPM HARM will pass near the emitter and crash into the sea, where the impact will break it apart and the pieces will sink to the bottom. The HE HARM will explode approximately 30-60 feet above the sea surface, near the emitter, and the remaining pieces will sink to the bottom.

Integrated and Sustainment Phase Training Scenarios
Both of these phases would typically combine the HARM launching aircraft with E-2 and F/A-18 aircraft conducting a strike mission against a land target in a scenario driven event

37 This event uses a target on a barge; all missiles are HE rounds.

AMPHIBIOUS WARFARE

FIRING EXERCISE (FIREX) WITH INTEGRATED MARITIME PORTABLE ACOUSTIC SCORING AND SIMULATION (IMPASS) SYSTEM

Surface ships use main battery guns to support forces ashore in their battle against threat forces. With the Integrated Maritime Portable Acoustic Scoring and Simulation System (IMPASS) system (discussed below), the shore area is simulated at sea.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
FIREX with IMPASS	CG, DDG	5" gun (IMPASS)[38]	8 hours	22 events (1,540 rounds)

Naval Surface Fire Support (NSFS) normally consists of the bombardment of a target within an impact area, by one or more ships. The ship is often supported by Navy, Marine, or NSW spotters ashore, or by spotters embarked in fixed-wing aircraft or helicopters in the air, to call for the fire support from the ship, and to adjust the fall of shot onto the target.

The locations and opportunities for live-fire from a ship at sea to targets ashore are very limited, and often the training range area is not adequate to establish and maintain surface fire support proficiency. A technology solution has been developed to precisely determine the impact of rounds fired at a simulated or virtual land area containing virtual targets located in the ocean, which enables ships to complete NSFS training in the absence of a land target or impact area.

CG and DDG with 5-inch Guns

FIREX with IMPASS

This exercise follows the same scenario as a FIREX (Land), except that the entire exercise is conducted at sea, and all of the spotters are simulated. The scenario is as follows: The ship positions itself about four to six nm from the target area to receive information concerning the target and the type and exact location of the target from the assigned spotter. One or more rounds are fired at the target. The fall of the round is observed by the spotter, who then tells the ship if the target was hit or if the ship needs to adjust where the next round should fall. More shots are fired, and once the rounds are falling on the target, then the spotter will request a larger number of rounds to be fired to effectively destroy the target. Typically five rounds are fired in rapid succession (about one round every 5 - 7 seconds). Ten or more minutes will pass, and then similar missions will be conducted until the allocated number of rounds for the exercise has been expended.

About 70 rounds of 5-inch NEPM or high explosive ordnance (typically 53% HE and 47% NEPM), in addition to about 5 rounds of illumination are expended by the CG or DDG during a typical exercise. The exercise is conducted during the day a minimum of 12 nm from shore. A ship will normally conduct three FIREXs at different levels of complexity over several months to become fully qualified.

The current training system is supported by the IMPASS system. The training system is an onboard computer system that provides a realistic presentation, such as a land mass with topography, to the ship's systems. The scoring system is deployed by the firing ship and consists of five sonobuoys set in a

[38]High Explosive rounds have a NEW of 8-lbs each. Both HE and NEPM rounds are used; notionally 39 HE rounds and 31 NEPM rounds are used per event.

pentagon-shaped arrangement at 1.3 km intervals. Within the ship's combat system, the training system creates a virtual land mass that overlays the array and simulates land targets. The ship fires its ordnance into this target area; the sonobuoys detect the bearing to the acoustic noise resulting from the impact of a high explosive or NEPM round landing in the water, then transmit their GPS position and their bearing information to the ship. From the impact location data collected, the training system computer triangulates the exact point of impact of the round and, from that data, the exercise may be conducted as if the ship were firing at an actual land target. When the training is complete, the IMPASS buoy system is recovered by the ship.

Basic Phase (Unit Level Training) Scenario

The FIREX with IMPASS exercise is conducted very similarly to the FIREX (Land) exercise from the ship perspective, even though the exercise is conducted completely at sea. Approximately five to 70 rounds of 5-inch NEPM or high explosive ordnance and five rounds of illumination are expended per exercise over several hours (approximately 8 hours). All exercises are conducted in daylight and outside of 12 nm from land in order to have sufficient sea space to maneuver the ship and lay out the IMPASS sonobuoy pattern.

Integrated and Sustainment Phase Training Scenarios

Typically does not differ significantly from the Basic Phase Scenario with respect to the NSFS procedures and ordnance used.

ELECTRONIC COMBAT

ELECTRONIC COMBAT OPERATIONS (EC OPS)

Aircraft, surface ships, and submarines attempt to control critical portions of the electromagnetic spectrum used by threat radars, communications equipment, and electronic detection equipment to degrade or deny the enemy's ability to defend its forces from attack and/or recognize an emerging threat early enough to take the necessary defensive actions.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Electronic Combat Operations	F/A-18 F-35 (JSF)	ALE-50/55 electronic jammer	1 hour	9 sorties
	F/A-18[39]		1 hour	100 sorties
	AOE, CG, CVN, DDG, FFG, LHA, LHD, LPD, LSD	SLQ-32	1.5 hours	165 events

EC OPS can be active or passive, offensive or defensive.

- Active EC OPS use radio frequency (RF) transmissions in the 2-12 gigahertz frequency spectrum to conduct jamming and deception.
  - Jamming bombards a radio or radar receiver with sufficient RF energy to cause the internal automatic gain setting of the receiving equipment to adjust the signal-to-noise threshold setting downward to a point where the desired RF return (for example, a radio voice, datalink transmission, or a target's radar return) is "lost" in the background noise of the RF spectrum.
  - Electronic deception may generate false targets that appear to be real, thereby causing the recipient of the false targets to commit forces or weapons to attack those targets, and, in the process, not attack the real target. Another type of deception allows the defender to deny the attacker's weapon system from successfully acquiring and engaging a valid target.
- Passive EC OPS use the enemy's electromagnetic transmissions to obtain intelligence about their operations and to recognize and categorize an enemy threat and take steps to defend against it.
- Offensive EC OPS use active or passive installed EC systems against enemy search, EC, and weapons systems. Electronically, this process is active (overpowering enemy receiver systems) or passive (chaff) jamming.
- Defensive EC OPS use active or passive installed EC systems in reaction to enemy threat systems. These installed EC systems are programmed to recognize an enemy threat signal and will automatically send a false return signal to the enemy threat system or dispense chaff and/or flares in immediate reaction to receiving an enemy threat signal. Missile, gun, or search radar signals are common threat signals that can initiate an automatic response.

Navy units can conduct EC OPS training as stand alone events, but they are often embedded in other training events, such as fighting through enemy jamming to deliver ordnance on targets or ejecting chaff and flares in response to enemy missile threat radars.

Training ranges need an EC OPS training capability that can generate threat signals that will exercise the full range of every platform's EC capability and also be able to evaluate the effectiveness of both the equipment and operator's tactical responses to those signals.

39 Appropriately configured Commercial Air Services (CAS) aircraft simulate threat fire control radars and jammers.

EC OPS are also categorized in several other NTAs where they are described as the primary exercise discussed. These NTAs include:

- NTA 3.2.4 - HARMEX, destruction of enemy threat radars.
- NTA 3.2.8 - Chaff Exercise, disruption of enemy threat search or guidance radars.
- NTA 3.2.8- Flare exercise, seduction of enemy threat missile guidance systems or infrared systems.

F/A-18C/D with ALQ-165 and F/A-18E/F with ALQ-214 Jamming System

- The AN/ALQ-165 is an automated active deception jammer designed to contribute to the electronic self-protection of the host aircraft from a variety of A-A and S-A radar threats.
- The AN/ALQ-124 is an Integrated Defensive Electronic Countermeasures (IDECM) Radar Frequency Countermeasures system that uses autonomous active techniques that deny, disrupt, delay, and degrade missile launch and firing solutions from a variety of air-to-air and surface-to-air radar and infrared threats. This system includes an onboard radio frequency countermeasures system as well as the ALE-55 Fiber Optics Towed Decoy, which is trailed behind the aircraft at varying lengths.

Basic Phase (Unit Level Training) Scenario

The F/A-18 will typically fly well above 3,000 feet at about 400 kts toward the threat signal generators used by the training range. When a threat signal is received the pilot reacts to the enemy missile threats by maneuvering and employing autonomous active jamming against the threat search radars or missiles. The typical sortie duration is 1 hour.

Integrated and Sustainment Phase Training Scenarios

Typically do not differ from the Basic Phase Scenario, except that it is employed during a major range event, at sea, and in conjunction with other friendly forces.

CG, DDG, FFG, LHA, LHD, LPD, LSD, CVN with SLQ-32

The SLQ-32 provides early warning, identification, and direction of threat targeting radars and weapon emitters to own ship systems that will engage hard kill weapons (*e.g.*, CIWS), automatically disperse chaff and flare decoys, and use active electronic emissions to counter inbound missiles.

Basic Phase (Unit Level Training) Scenario

Surface ships detect and evaluate threat electronic signals from threat aircraft or missile radars, evaluate courses of action concerning the use of passive or active countermeasures, then use ship maneuvers and either chaff, flares, active electronic countermeasures, or a combination of them to defeat the threat. The typical event duration is 1.5 hours.

Integrated and Sustainment Phase Training Scenarios

Typically do not differ from the Basic Phase Scenario.

Training Considerations

Threat signals are commonly provided by a commercial air service Lear Jet with a threat signal simulator pod that flies an appropriate threat missile profile.

CHAFF EXERCISE (CHAFFEX)

Ships, fixed-winged aircraft, and helicopters deploy chaff to disrupt threat targeting and missile guidance radars and to defend against an attack.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Chaff Exercise	F/A-18	RR-144A/AL defensive chaff	1 hour	1,770 sorties (17,700 canisters)
	MH-60R/S		1 hour	6 sorties (180 canisters)
	F/A-18, MH-60R/S, F-35 (JSF)[40]		1 hour	12 sorties (120 canisters)
	CG, DDG, FFG, LCC, LHA, LHD, LPD, LSD	MK-214 defensive (seduction) chaff [41]	3 hours	25 events (150 canisters)
		MK-216 defensive (distraction) chaff	3 hours	8 events (48 canisters)

The chaff exercise trains aircraft in the use and value of chaff to counter an enemy threat. Chaff is a radar reflector material made of thin, narrow, metallic strips cut in various lengths to elicit frequency responses, which deceive enemy radars. Chaff is employed for a number of different tactical reasons, but the end goal is to create a target from the chaff that will lure enemy radar and weapons system away from the actual friendly platform.

Chaff may be employed offensively, such as before a major strike to "hide" inbound striking aircraft or ships, or defensively in reaction to being detected by an enemy targeting radar. Defensive chaff training is the most common exercise used for training both ships and aircraft. In most cases, the chaff exercise is training for the ship or aircraft that actually deploys the chaff, but it is also a very important event to "see" the effect of the chaff from the "enemy" perspective so radar system operators may practice corrective procedures to "see through" the chaff jamming, so exercises are often designed to take advantage of both perspectives.

Chaff exercises are often conducted with flare exercises, as well as other exercises, rather than as a standalone exercise.

F/A-18C/E/F; MH-60R/S; JSF with Defensive Chaff

There are various types of chaff; the type used varies based on the anticipated threat frequencies to be countered. Typical chaff includes:

- RR-144A/AL - designed specifically for training and used by all naval airframes.

Basic Phase (Unit Level Training) Scenario

Aircraft detect electronic targeting signals from threat radars or missiles, dispense chaff, and immediately maneuver to defeat the threat. The chaff cloud deceives the inbound missile, and the aircraft clears away from the threat.

40 RDT&E flights.
41 Super Rapid Bloom Off-board Chaff (SRBOC).

The chaff disperses with the winds over a wide area and eventually settles in limited concentrations over the surrounding land or sea areas where it was dispensed. The typical event duration is 1 hour for aircraft.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario.

CG, DDG, FFG, LCC, LHA, LHD, LPD, LSD with MK-214 or MK-216 Super Rapid Bloom Off-board Chaff (SRBOC) Defensive Chaff
Defensive chaff deployed from ships is typically MK-214 (Seduction Chaff) or MK-216 (Distraction Chaff) from the MK-36 SRBOC launcher. The specific type and amount of chaff deployed depends on the specific tactical situation.

Basic Phase (Unit Level Training) Scenario
A surface ship detects an electronic targeting signal or the ship's search radar detects an inbound threat missile. Chaff rounds are fired automatically or manually, depending on the setting selected for the tactical situation, from the MK-36 Super Rapid Bloom Off-board Countermeasures (SRBOC) Chaff and Decoy Launching System, or other similar systems. The chaff forms a cloud that presents a ship size "target," forcing the inbound missile to make a choice between the chaff and the real ship. With the employment of additional countermeasure tactics, the ship may maneuver away from the cloud and cause the missile to choose the chaff "target."

The chaff disperses with the winds over a wide area and will eventually settle in limited concentrations over the surrounding sea areas where it was dispensed. The typical duration is 3 hours for ships.

Integrated and Sustainment Phase Training Scenarios
Typically do not differ from the Basic Phase Scenario.

Training Considerations
The chaff exercise trains shipboard personnel in the use and value of chaff to counter an enemy threat. Chaff is a radar reflector material made of thin, narrow, metallic strips cut in various lengths to elicit frequency responses, which will deceive enemy radars. Chaff is employed for a number of different tactical reasons, but the end goal is to create a target from the chaff that will lure enemy radar and weapons system away from the actual friendly ship.

FLARE EXERCISE (FLAREX)

Fixed-winged aircraft and helicopters deploy flares to disrupt threat IR missile guidance systems to defend against an attack.

Operation	Platform	System / Ordnance	Event Duration	Number of Events
Flare Exercise	F/A-18	MK-46 MOD 1C, MJU-8A/B, MJU-27A/B, MJU-32B, MJU-53B, SM-875/ALE defensive flares[42]	1 hour	50 sorties (250 flares)
	MH-60R/S		1 hour	6 sorties (180 flares)
	F/A-18, MH-60R/S, F-35 (JSF)		1 hour	7 sorties (35 flares)

Flare exercises principally train aircraft personnel in the use of defensive flares that are designed confuse infrared sensors or infrared homing missiles, thereby causing the sensor or missile to lock onto the flares instead of the real aircraft. Aircraft decoy flares use a magnesium extruded flare grain.

Flare exercises are often conducted with chaff exercises, as well as other exercises, rather than as a standalone exercise.

F/A-18C/E/F; MH-60R/S; JSF with Defensive Flares

Types of flares used by aircraft and helicopters include:

- MK-46 MOD 1C - used on SH-60B/F; MH-60R/S; HH-60H; MPA.
- MJU-8A/B - training flare used on tactical aircraft and MH-53E.
- MJU-27A/B - used on SH-60B/F; MH-60R/S; HH-60H; F/A-18D/E/F.
- MJU-32B - used on SH-60B/F; MH-60R/S; HH-60H; MPA.
- MJU-53B - replacing MJU-7A/B, used on F/A-18E/F.
- SM-875/ALE - simulator flare, used on all naval airframes.

Basic Phase (Unit Level Training) Scenario

Aircraft detect electronic targeting signals from threat radars or missiles or see a threat missile plume when it is launched, then dispense flares and immediately maneuver to defeat the threat. Typically an aircraft will expend five flares in an exercise while operating above 3,000 ft. Each flare is completely consumed while it is in the air. The typical event duration is 1 hour.

Integrated and Sustainment Phase Training Scenarios

Typically do not differ from the Basic Phase Scenario

42 These are training and test events. Flare release events are not necessarily dedicated sorties.

RESEARCH, DEVELOPMENT, TESTING AND EVALUATION (RDT&E)

RDT&E is conducted principally by Naval Air Systems Command (NAVAIR), Naval Sea Systems Command (NAVSEA), Space and Naval Warfare Systems Command (SPAWAR), and the various commands that report to them. NAVSEA conducts RDT&E on various surface and subsurface systems, and SPAWAR focuses on engineering and fleet support for command, control and communications systems and ocean surveillance. NAVAIR conducts testing of aircraft, aircraft weapons, and the "Integration Testing" of all subsystems (including weapons) with the aircraft.

RDT&E operations can be further categorized within at least three subcategories:

- Operational Test & Evaluation (OT&E)
- Developmental Test & Evaluation (DT&E)
- Production Acceptance Test & Evaluation.

The principal output of RDT&E range operations is data. All Operational T&E, Developmental T&E, and live-fire T&E activities require some method for data collection/capture/recording and debrief, and therefore require sophisticated range instrumentation and advanced range communications. In many cases, this equipment can be used for both RDT&E and unit training by providing more detailed feedback to the units being trained.

Tests include a wide variety of aircraft, ships, ocean engineering, missile firings, torpedo testing, manned and unmanned submersibles, unmanned aerial and underwater vehicles, electronic warfare and other Navy weapons systems. Tests are used principally for equipment maintenance and to ensure that the equipment within a unit works well together. Table D-1 describes RDT&E events in greater detail.

Operation	Operation Description
Testing and Evaluation Operations	Chief of Naval Operations (CNO) designated activities, torpedo, torpedo defense, submarine and periscope detection, ship-defense systems, missile defense, and other miscellaneous programs (such as gunnery/special weapons tests). These programs involve the testing and evaluation of enhancements on systems already used in exercises conducted in the range complex.
Ocean Engineering	Ocean Engineering research and development testing involves ocean deployment of hardware, cabling, mine countermeasures equipment (including HE ordnance testing), underwater tools and equipment and related components. Test items are placed in appropriate locations in the water and/or on the sea floor to measure long-term effects of exposure to the marine environment, with test durations running from days to decades depending on the item being tested. Items undergoing testing can be continuously monitored via underwater video, electronics, or other passive means. Monitoring is also periodically performed with SCUBA divers or with remotely operated vehicles piloted from the pier or a small boat. Removal of marine growth from the items being tested is required periodically.
Anti-Air Warfare RDT&E	Testing on Aegis capable ships after refurbishment or overhaul.
Aircraft Flight Tests	These flights involve similar tasks and maneuvers that are part of the AIC mission; *i.e.*, maneuvering flight, use of radar, navigation, data links, sensors, fire control systems, *etc*. Flights can involve various fixed wing and rotary wing aircraft, including UAVs. Speeds are typically between 50 and 500 kts, but can reach supersonic (Mach 1.4) on occasion.
Surface Ship Radiated Noise Measurements	Surface Ship Radiated Noise Measurements (SSRNM) are assessments conducted on surface ships at a specified periodicity to determine a ships radiated noise in the water while operating underway. The data collected in the SSRNM can be used to reduce a ship's radiated noise and thereby increase the ship's threat detection capability, reduce mutual ship interference, reduce the ability of a passive torpedo to acquire the ship, and reduce the chance of the ship detonating an acoustically-activated mine.

Operation	Operation Description
Anti-Submarine Warfare (ASW)	ASW typically involves the use of sonobuoys deployed from aircraft to detect submerged threats. Other equipment used can include explosives (SUS MK61, SUS MK64, Marine markers, and dipping sonars. Typical aircraft involved include helicopters, P-3s, and Multi-mission Maritime Aircraft.
Sonobuoy Quality Assurance/Quality Control	Sonobuoys are expendable devices used for the detection of underwater acoustic sources and for conducting vertical water column temperature measurements. The Navy's sonobuoy QA/QC program is a test and evaluation effort to ensure manufacturer compliance with operational and technical specifications. Four types of sonobuoys are tested: passive, active, bathythermograph and explosive. Those sonobuoys that perform satisfactorily are scuttled and not recovered. Those that fail testing are recovered for analysis and rework. A boat in the vicinity of the impact area monitors the area for safety and recovers malfunctioning sonobuoys.
Combat System Ship Qualification Trial	Conducted for new ships and for ships that have undergone modification and/or overhaul of their combat systems, can include operating any or all of a ship's combat systems.
RDT&E Bombing Exercises (BOMBEX)	BOMBEX involves aircraft employing bombs (98% NEPM) and the release of other inert stores such as empty fuel tanks, launch rails, mass models, and other similar objects on various types of stationary and mobile targets.
Electronic Combat/Electronic Warfare	Tests designed to assess how well EC/EW exercises are performed. Includes signal identification, electronic systems operations, and the deployment of chaff, flares, and decoys.
Acoustic Trials	Acoustic testing, meant to increase ship survivability in threat environments, identifies a ship's quiet operating speeds, defines the ship's radiated acoustic signature, outlines noise problems and isolates sources of classifying tones.
High Frequency	Use of high frequency radio signals and the evaluation of their effectiveness.
At Sea Bearing Accuracy Tests (ASBAT)	ASBAT determines the accuracy of submarine radio direction finding equipment, and provides test signal generation or Radio Direction Finding signals for electronic surveillance measures shipboard sensors as well as underwater tracking, communications, and surveillance radar.
Weapons RDT&E	General air-to-air, air-to-surface, surface-to-air, and surface-to-surface missile exercises. Various rockets or missiles may be tested, including but not limited to AIM-120 AMRAAM, AIM-9 Sidewinder, AIM-132 ASRAAM, and AIM-7 Sparrow. Various targets may be employed, and chaff and flares may also be incorporated into the missile tests. In Air-to-Surface missile events, the following missiles may be used: AGM-45 Shrike; AGM-114 Hellfire; AGM-88 HARM; AGM-65 LSR Maverick; AGM-119 Penguin; BQM 34/74 Firebee/Chukar; GQM-163 Coyote; AGM-62 Walleye; AGM-84 Harpoon. The Firebee/Chukar and Coyote are airborne targets launched from Wallops Island. Gunfire events at sea can include expenditure of predominantly 20mm projectiles; however, .50 cal, 7.62 mm, 25mm, 30mm and 40mm are used on occasion.
Weapon System Accuracy Trials	WSAT are conducted aboard Anti-Submarine Warfare (ASW) capable ships to demonstrate their performance after construction, conversion, or overhaul. The WSAT is a comprehensive test of the complete ASW combat system and is the final examination before Combat System Certification. Functions tested include target acquisition and tracking, fire control solution, weapons launch, and weapons delivery accuracy. WSATs dynamically evaluate the accuracy of ship ASW, navigation, and weapon system errors; determine system adequacy, and are used to align systems and to improve design. The WSAT uses differential Global Positioning System (GPS), microwave underwater tracking, and/or optical theodolites to determine the ship's position and heading accurately. Data are collected on each of the ship's sensors and merged with tracking data to computer range and bearing errors and to evaluate alignment.

Operation	Operation Description
Airborne Mine Countermeasures RDT&E	These events involve deployment and operation of mine detection **and neutralization** equipment from helicopters at sea. Mine detection equipment can include: AN/**AQS**-20A, Airborne Laser Mine Detection System (ALMDS), **and Organic Airborne and Surface Influence Sweep (OASIS) system**. **Mine neutralization equipment can include** Airborne Mine Neutralization System (AMNS) and Rapid Airborne Mine Clearance System (RAMICS).
Joint Task Force Wide Area Relay Network	Demonstration of advanced Command, Control and Communications technologies in a highly mobile, wireless, wide-area relay network in support of tactical forces.
Test Unmanned Surface Vehicles	Remote-controlled boats equipped with modular packages to potentially support surveillance and reconnaissance activities, mine warfare, anti-terrorism/force protection, port protection, Special Forces operations, and possibly anti-submarine warfare.

Operation	Operation Description
Test Unmanned Aerial Vehicles	Remotely piloted or self-piloted aircraft that include fixed-wing, rotary-wing, and other vertical takeoff vehicles. Can carry cameras, sensors, communications equipment, weapons, or other payloads. Could support: intelligence, surveillance, and reconnaissance; suppression of enemy air defenses; electronic attack; anti-surface ship and anti-submarine warfare; mine warfare; communications relay; and derivations of these themes.
NAVAIR Events in Support of NAVSEA	The NAVSEA RDT&E operations that NAVAIR supports include test operations such as Ship Self Defense Systems (SSDS), Combat Surface Ship Qualification Trials (CSSQT), Cooperative Engagement Capability (CEC), Theater High Altitude Air Defense, Ship Survivability Tests, Electronic Warfare, Littoral Combat Ship (LCS) and DDX Trials, and similar scenarios. These support operations include target presentation, support aircraft flights, data collection, analysis, range safety, electronic warfare support, reconnaissance, ship ground station interface, and other aviation related support to MISSILEX and TRACKEX events. BQMs, Coyotes and AQMs are launched from NASA Wallops, Dam Neck or NAWC38 vessel, *etc*. Aerial Target Presentations in support of Live MISSILEX Events. BQM-34/74 (subsonic) aerial targets. BQM denotes surface launched, AQM denotes air-launched. Coyote is a supersonic aerial target. Several other types of missiles may be launched from the NAVSEA platform under test. They could include SM-1, SM-2, Rolling Airframe Missile, Sea Sparrow, Tomahawk, or other types of surface launched weapons. The Phalanx weapons systems may also be deployed during certain exercises.
Shipboard Electronic Systems Evaluation Facility (SESEF) Quick Look Tests	Evaluate ship, shore, and aircraft systems that emit or detect electronic emissions. These systems include those used for radio communications, data transfer, navigation, radar, and identification of friend and foe.
SESEF System Performance Tests	Provide accuracy checks of ship and submarine sonar, both in active and passive modes, and to evaluate the accuracy of a ship's radar
Fleet Operational Readiness Accuracy Check Site (FORACS) Tests	Provide accuracy checks of ship and submarine sonar, both in active and passive modes, and to evaluate the accuracy of a ship's radar.
Directed Energy	Develop the necessary standard operating procedures and range safety requirements necessary to provide safe operations associated with future high energy laser tests.

MAJOR RANGE EVENTS

A Major Range Event is a significant operational employment of live forces during which live training is accomplished.

- It is a major field and/or at-sea exercise with multiple training objectives.
- It usually occurs over an extended period of days or weeks.
- It is typically composed of multiple range operations, each with its own mission, objective, and time period.
- The composition and timing of range operations may be driven by a scenario to create an anticipated real-world situation.

Major range events, typically include:

- Carrier Strike Group Composite Training Unit Exercise (CSG COMPTUEX)
- Expeditionary Strike Group Composite Training Unit Exercise (ESG COMPTUEX)
- JTFEX.

Major range events:

- Are significant operational employments during which range operations are conducted involving multiple NTAs/MCTs, units, and capabilities.
- Normally involve a large number of personnel and air, surface, subsurface and ground assets in multi-dimensional exercises designed to train a force for deployment.
- Typically occur across a broad area of a range complex or in multiple range complexes.

Participants typically include as many as:

- Ten surface ships (CVN or LHA/LHD, LPD, and LSD, and CGs, DDGs, and FFGs)
- Three submarines (SSN)
- One hundred aircraft, both fixed winged and helicopters
- Eight thousand personnel embarked in the ships and aircraft.

A major range event is essentially a number of "unit level" range operations conducted by several units operating together and directed by a centralized command and control commander, such as a Strike Group commander. For example, a Carrier Strike Group could conduct a coordinated antisubmarine operation in which several units (CVN, CG, DDG, SH-60B/F, MH-60R, MPA, SSN) work together to find and "destroy" an "enemy" submarine within a larger scenario where other units conduct an air strike against a target ashore.

Any of the range operations included in this publication could feasibly be included in a major range event. Range operations are chosen to be included in the major range event based on the anticipated operational missions that will be performed during the Strike Group's deployment and the state of readiness already achieved by the participating units.

CSG COMPTUEX

The CSG COMPTUEX is an Integrated Phase, at-sea, major range event that integrates the aircraft carrier and carrier air wing with surface and submarine units in a challenging environment. Commander Strike Force Training Atlantic schedules and conducts the CSG COMPTUEX in accordance with a schedule of events plan. It is nominally 26 days long with two scenario-driven "mini" multi-threat battle problems, one that is about 24 hours long and the other about 18 hours long.

The operations included in the scenario are specifically tailored for the operational training that is needed by the Strike Group prior to their deployment, and they are held at various times of the year depending on the rotational nature of the Strike Group's deployment. Typically, live-fire operations that take place during COMPTUEX include long-range air strikes, NSFS, and other surface gunnery and missile exercises.

ESG COMPTUEX

The ESG COMPTUEX is an Integrated Phase, at-sea, major range event that is a standard part of every MEU's pre-deployment training program and lasts for about 18 days. The exercise centers on situational training exercises in which the MEU is issued a series of orders that are designed to replicate the types of missions they are likely to face during their deployment. The MEU then quickly plans and executes the missions to test their rapid-response capabilities. An ESG COMPTUEX is sometimes held during the same time frame as the JTFEX.

Typically, the first half of the ESG COMPTUEX focuses on preparing the amphibious ships of the ESG for the missions they will perform while on deployment. The embarked Marines normally launch ship-to-shore raids and conduct urban-combat training at areas ashore. Over the next several days, the MEU's equipment and its ground combat element are loaded into the amphibious ships of the ESG by landing craft from the beach.

JOINT TASK FORCE EXERCISE (JTFEX)

JTFEX is a scenario-driven, sea control, power projection exercise with the purpose of evaluating the readiness of naval forces and testing the interoperability and proficiency of these forces in realistic scenarios ranging from military operations other than war to armed conflict. JTFEX typically encompasses operations from in port to sea-air-land combat, to special warfare, to humanitarian assistance operations.

JTFEX is a dynamic and complex major range event that is the culminating exercise in the Sustainment Phase training for the Carrier Strike Group (CSG) or Expeditionary Strike Group (ESG). Commander Third Fleet and Commander Second Fleet have specified hundreds of Sustainment Phase training objectives contained within most warfare mission areas for CSGs and ESGs to accomplish through the range operations that are included in their tailored JTFEX. JTFEX may be conducted simultaneously with CSGs and ESGs working together, but this opportunity is infrequent because of their differing schedules.

JTFEX emphasizes mission planning and effective execution by all primary and support mission elements, including command and control, surveillance, intelligence, logistics support, and the integration of tactical fires. JTFEXs are complex and evaluate a strike group in all warfare skills. JTFEX is

nominally 10 days long, not including a 3-day in port Force Protection Exercise, and can be the last at-sea exercise for the CSG prior to deployment.

JTFEXs usually involve one CSG or ESG made up of the following participants:

- CSG: 1 CVN with Carrier Air Wing, 1 CG, 1-2 DDG, 1-2 FFG, 1 AOE, 1 SSN or SSGN
- ESG: 1 LHA or LHD with Air Wing, 1 CG, 1-2 DDG, 1-2 FFG, 1 LPD, 1 LSD, 1 AOE, 1 SSN or SSGN, Embarked Marines.

The vast majority of range operations specified for a JTFEX can be completed within the training areas of a single range complex, but depending on the exercise scenario, they may expand to include the use of other nearby ranges.

MISCELLANEOUS RANGE EVENTS

A Miscellaneous Range Event is an operational employment of live forces during which live training is accomplished and usually:

- Has a smaller number of forces than a major range event;
- Is more focused on a specific type of training, such as antisubmarine warfare;
- Has multiple training objectives; and
- Occurs over one or just a few days.

Like a major range event, each operation may have its own mission, objective, and time period, or be scenario driven. Examples include:

- Sink Exercise (SINKEX)
- Air Defense Exercise (ADEX)
- Maritime Integrated Tailored Training (MITT) Exercise
- Southeastern Antisubmarine Warfare Training Initiative (SEASWTI)
- Tailored Training Threat Exercise (T3EX)
- Surge Exercise (SURGEX)
- Expeditionary Fires Exercise (EFEX)
- Special Operations Capable exercise (SOCEX)
- Certification Exercise (CERTEX)
- Supporting Arms Coordination Exercise (SACEX)

Since 1999, the Navy completed 16 SINKEXs in the western North Atlantic Ocean, including waters offshore of Puerto Rico (NMFS 2006). Figure D-1 shows the locations of these SINKEXs, and the area of primary activity.

SINKEX

A SINKEX is typically conducted by aircraft, surface ships, and submarines in order to take advantage of a full size ship target and an opportunity to fire HE weapons. For detailed information on the SINKEX program please refer to the Programmatic Overseas Environmental Assessment for Sinking Exercises (SINKEX) in the Western North Atlantic Ocean prepared by NAVSEA for United States Fleet Forces in November 2006.

The target is typically a decommissioned combatant or merchant ship that has been made environmentally safe for sinking. It is placed in a specific location so that when it sinks it will serve another purpose, such as a reef, or be in deep water where it will not be a navigation hazard to other shipping.

Ship, aircraft, and submarine crews typically are scheduled to attack the target with coordinated tactics and deliver HE ordnance to sink the target. NEPM ordnance is often used during the first stages of the event so the target may be available for a longer time. The duration of a SINKEX is unpredictable because it ends when the target sinks, but the goal is to give all forces involved in the exercise an opportunity to deliver HE ordnance. Sometimes the target will begin to sink immediately after the first weapon impact and sometimes only after multiple impacts by a variety of weapons. Typically, the exercise lasts for 4 to 8 hours and possibly over 1 to 2 days, especially if NEPM ordnance, such as 5-inch gun projectiles or MK-76 dummy bombs, is used during the first hours.

A SINKEX occurs only occasionally, maybe once a year per coast, probably during a JTFEX, and is conducted under the auspices of a permit from the U.S. Environmental Protection Agency (USEPA).

The participants and assets could include:

- One full-size target ship hulk
- One to five CG, DDG, or FFG firing ships
- One to 10 F/A-18, or MPA firing aircraft
- One or two HH-60H, MH-60R/S, or SH-60B Helicopters
- One E-2 aircraft for Command and Control
- One firing submarine
- One to three range clearance aircraft.

Some or all of the following weapons could be employed:

- Two to four Harpoon surface-to-surface or air-to-surface missiles
- Two to eight air-to-surface Maverick missiles
- Two to 16 MK-82 General Purpose Bombs
- Two to four Hellfire air-to-surface missiles
- One or two SLAM-ER air-to-surface missiles
- Fifty to 500 rounds 5-inch and 76 mm gun
- One MK-48 heavyweight submarine-launched torpedo
- Two to Ten Thousand rounds .50 cal and 7.62 mm.

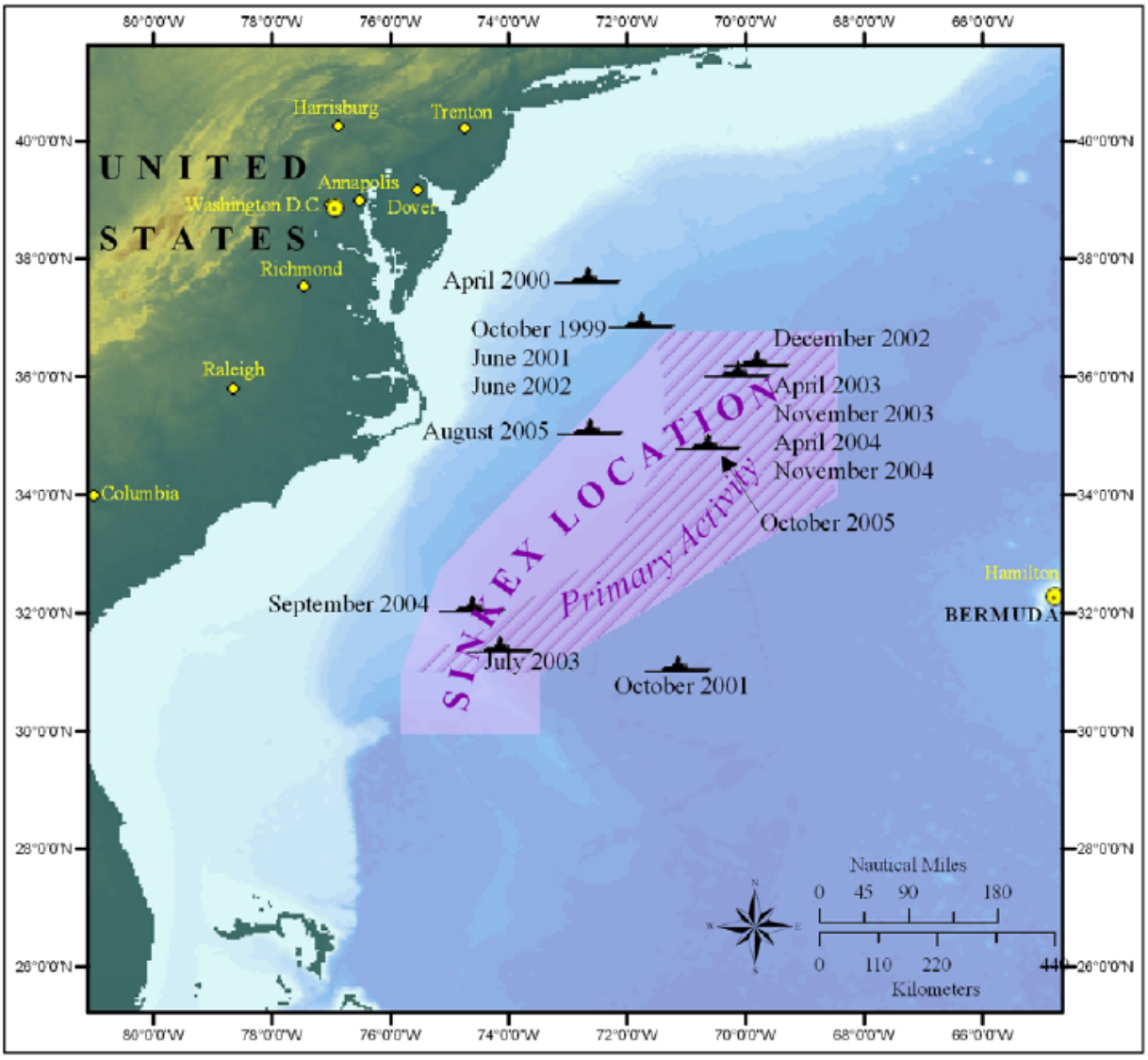

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Figure D-1: Locations of Previous SINKEXs (NMFS 2006)

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APPENDIX E

WEAPONS SYSTEMS DESCRIPTIONS

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TYPICAL EXISTING TARGET SYSTEMS USED IN THE VACAPES RANGE COMPLEX

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AIR TARGETS

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NORTHROP GRUMMAN

DEFINING THE FUTURE™

BQM-74E

Delivering High Performance at Low-Cost and Supporting More Than 80 Percent of the U.S. Navy's Target Missions

The BQM-74E is a turbojet-powered aerial target with high performance capabilities. While emulation of enemy anti-ship cruise missiles is the primary mission; others include simulation of aircraft for training naval aviators in air-to-air combat and support of the test and evaluation of new weapon systems. The BQM-74E and its ground support system are highly portable. This attribute enables shipboard operations in support of deployed naval combatants where maximum flexibility and rapid turnaround are required.

The BQM-74E can carry a variety of internal and wing tip-mounted payloads in support of mission requirements. Payloads include passive and active radar augmentation, infrared (IR) flares, electronic countermeasures (ECM), seeker simulators, scoring, IFF, and dual wing tip-mounted tow bodies. The Integrated Avionics Unit, with its integral Inertial Measurement Unit (IMU), Air Data Computer, and Global Position System (GPS), provides a highly accurate navigation solution. Recently incorporated Low Altitude Control Enhancement (LACE II) software allows the vehicle to perform complex, programmable, 3-dimensional maneuvers and operate down to altitudes of 7 feet.

The BQM-74E can be used with multiple command and control systems, including the Integrated Target Control System (ITCS), Multiple Aircraft GPS Integrated Command Control (MAGIC2), Vega, and System for Naval Target Control (SNTC). It can be employed in either a manual mode or a pre-programmed (hands off) mode.

Since 1968, the MQM/BQM-74 series of aerial targets has been the workhorse of the Navy's subsonic aerial target inventory. Due to its exceptional performance and mission reliability, the BQM-74E has provided over 80 percent of all U.S. Navy target presentations.

Specifications

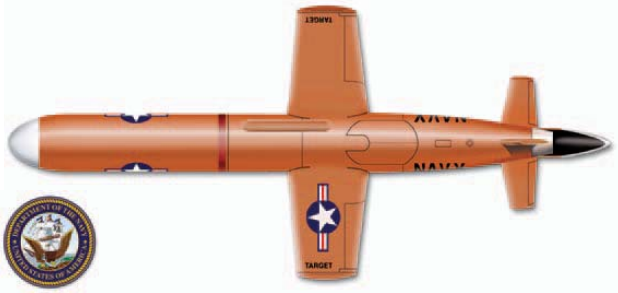
Length	12.95 ft (4.0 m)
Wingspan	5.78 ft (1.8 m)
Range	>350 nm (648.6 km)
Altitude	
Low	7 ft (2.1 m)
High	40,000 ft (12.2 km)
Speed	>515 Knots at Sea Level
Weight	455 lbs (206.4 kg)
Endurance	78 Minutes
Navigation	GPS/IMU
Fuel	Jet Fuel (JP-5, JP-8, or Jet A-1)

The Navy's Premier Aerial Target

The linchpin in RDT & E and training operations since 1978.

Payloads

- Passive or Active Radar Augmentation
- Seeker Simulators
- Infrared Augmentation
- Tow Systems
- Scoring Systems
- IFF
- Electronic Countermeasures



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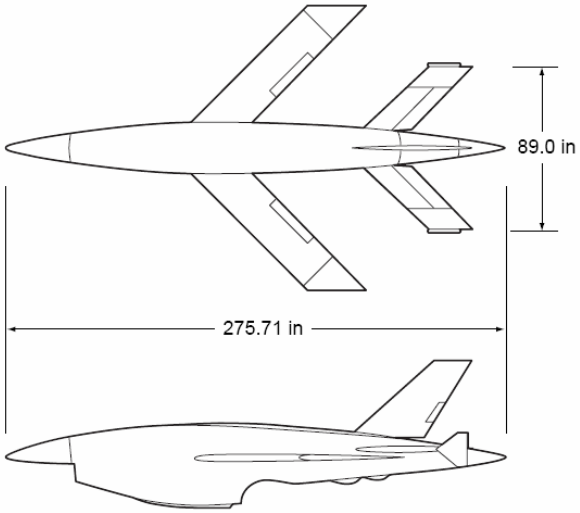
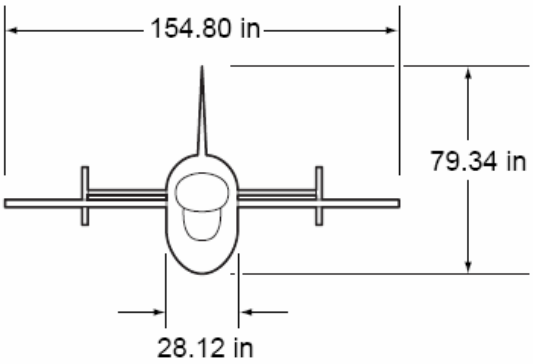
BQM-34S Firebee

Description

The BQM-34S Firebee subsonic fixed-wing family consists of a recoverable, remote-controlled, subsonic platform. The target is controllable through normal flight maneuvers with capabilities of performing up to 5g turns. The BQM-34 can be controlled using the Fixed Ground Control Station (FGCS), Drone Formation Control System (DFCS) or the Target Tracking and Control System (TTCS) at WSMR or the Integrated Target Control System (ITCS) at Point Mugu and China Lake or the System for Navy Target Control (SNTC) at major Navy ranges. The BQM-34 can accommodate a variety of Target Auxiliary/Augmentation Systems (TA/AS), including radar and infrared augmentation, threat emitters, countermeasures, scoring, location and navigation, and visual augmentation. The target is capable of formation flight using the DFCS. The Navy's BQM-34S total gross weight limit is 2,500 pounds for ground launches. This allows for just less than 300 pounds of payloads, ballast, and TA/AS equipment. Top speed is Mach 0.95 with a service ceiling of 60,000 ft. Endurance is up to 115 minutes. Thrust is provided by a GE J85-100 producing 2,850 lbs of thrust or a J-69 producing 1960 lbs of thrust.

Physical Characteristics





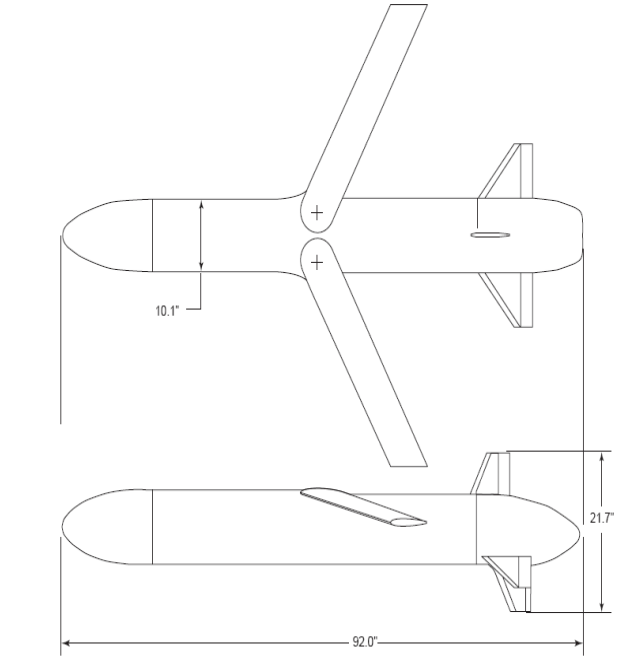
AN-ADM-141A/B Tactical Air-Launched Decoy (TALD)

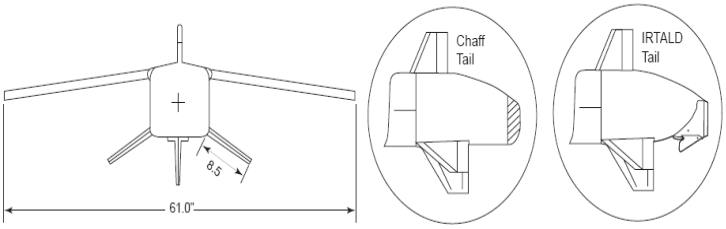
Description

The TALD (AN-ADM-141A/B) is an expendable glide vehicle with a square fuselage, flip-out wings, and three tail control surfaces. The wings, which are folded during carriage, open 3 seconds after launch. The necessary command sequences are pre-programmed on the ground. The AN-ADM-141A has passive and active radar enhancers.

The TALD is cleared for launch from S-3, A-4, F-4, A-6, A-7, F-14, F/A-18, AV-8 & UK GR7 platforms.

Physical Characteristics





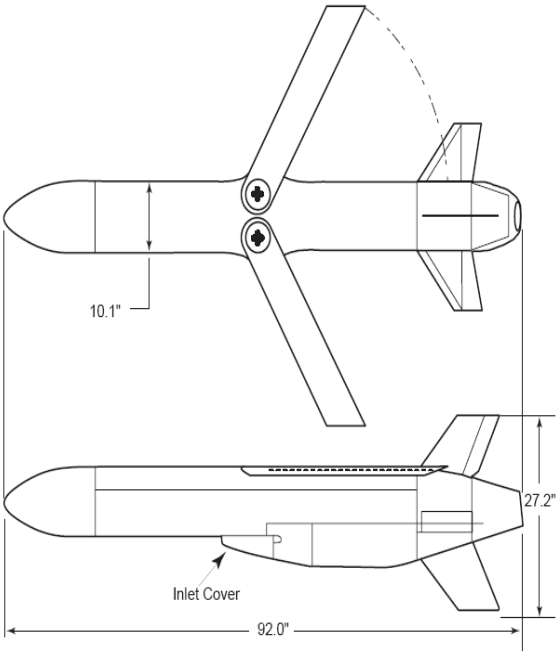
AN-ADM-141C Improved Tactical Air-Launched Decoy (ITALD)

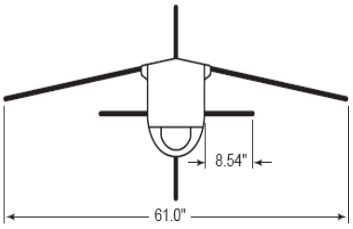
Description

The ITALD (AN-ADM-141C) is a modified propelled version of the TALD which incorporates a turbojet engine, the Teledyne CAE J700-CA-400. The engine starts after launch produces 170 lbs, has a 5.7 gallon fuel bladder and uses JP-10. This engine provides three constant airspeed settings. The necessary command sequences are pre-programmed on the ground. The ITALD is capable of climbs and descents, left or right turns, or an offset maneuver.

The ITALD is only carried on the F/A18C&D. It carries a max loadout of 6 ITALDs.

Physical Characteristics



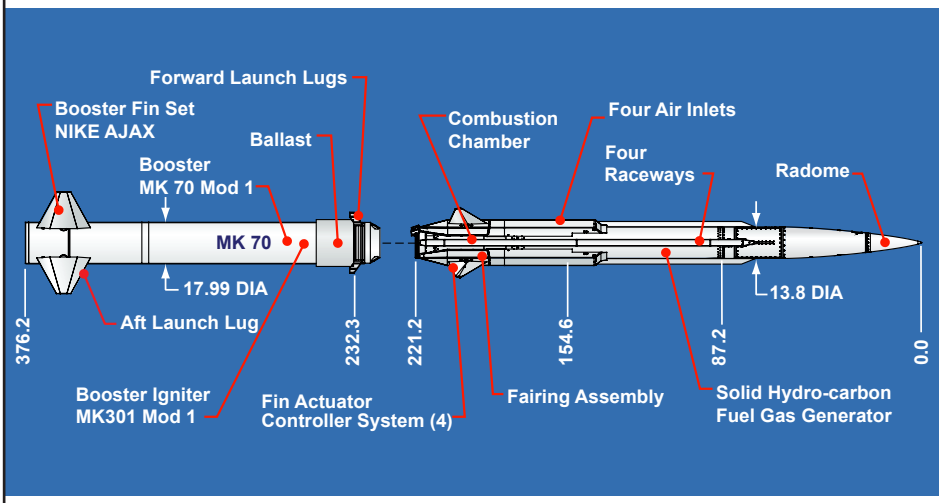


Wing Area: 2.74 ft²
Overall Length: 92 inches
Gross Weight: 375 lbs

FACT SHEET

GQM-163A Coyote

Supersonic Sea Skimming Target

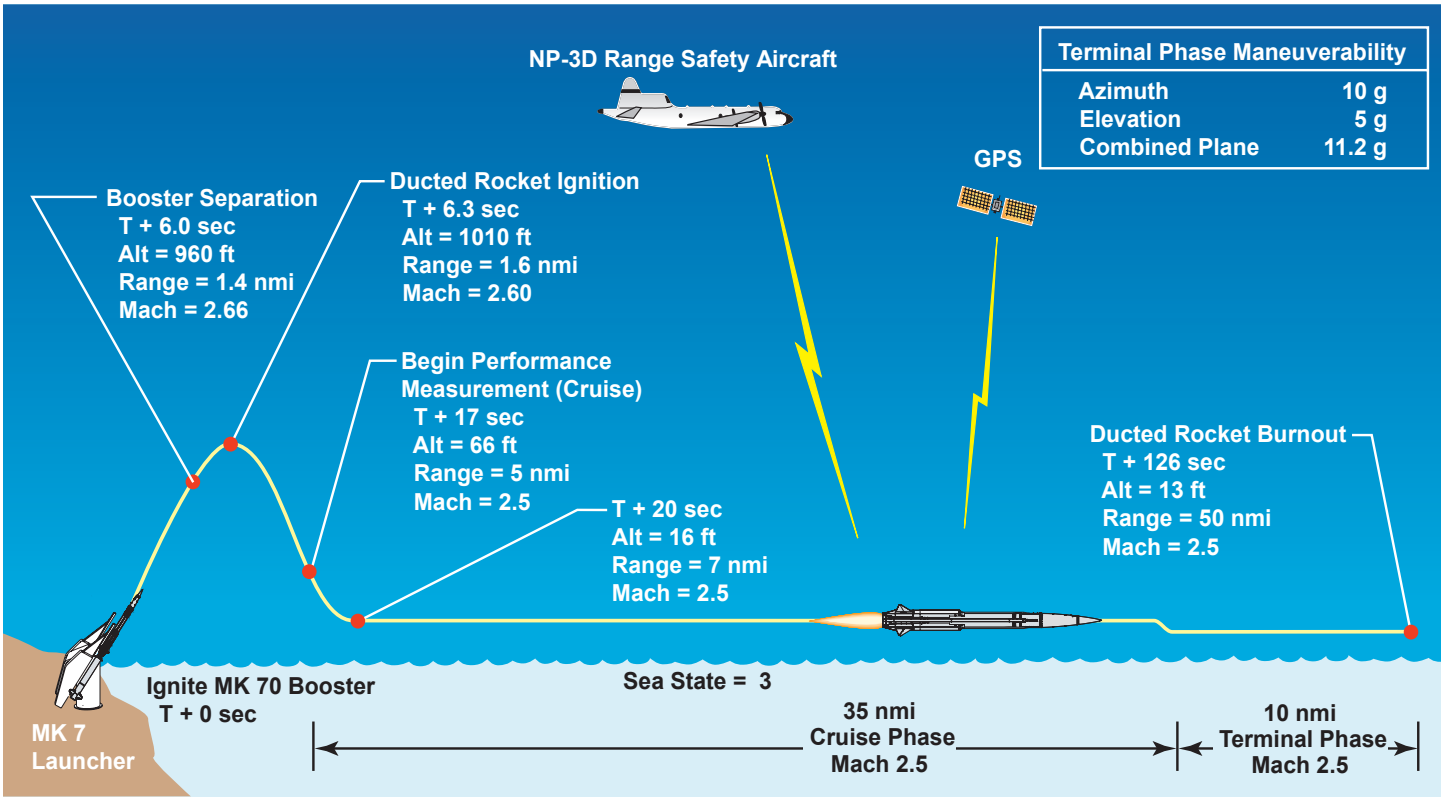


GQM-163A Program Overview

On 29 June 2000, Orbital Sciences Corporation, Launch Systems Group was awarded a $34 million Engineering and Manufacturing Development (EMD) contract for the GQM-163A Supersonic Sea Skimming Target system. Orbital's proven TMD and NMD ballistic missile target design philosophy of maximizing residual missile assets and off-the-shelf hardware and technology is being applied to cruise missile targets. This approach provides the U.S. Navy with the best value, lowest risk and highest performing GQM-163A system.

The GQM-163A MK 70 Booster/Ducted Rocket Sustainer configuration makes judicious use of residual Standard Missile assets and the $80 million U.S. Government investment in solid-fueled ducted rockets/ramjets. Major subcontractors, Aerojet and CEi, complement Orbital's systems engineering and integration strengths. The GQM-163A ducted rocket sustainer is based on technology developed by ARC under the U.S. Air Force's Variable Flow Ducted Rocket (VFDR) program. The GQM-163A avionics and front end structure are derivatives of the U.S. Navy AQM-37D Aerial Target System.

GQM-163A Coyote



Representative GQM-163A Mission Profile and System Performance

Customer: Program Executive Office for Strike Weapons and Unmanned Aviation, PEO(W)
Aerial Targets and Decoys Program Office, PMA-208

Objectives: Provide a Cost-Effective Target To Simulate the Supersonic Sea Skimming Anti-Ship Cruise Missile (ASCM) Threat

Support RDT&E of Ship Defense Systems and Support Fleet Training Exercises

Operational: October 2005

Prime Contractor: Orbital Sciences Corporation – Launch Systems Group, Chandler, Arizona

Major Subcontractors:

Aerojet, Camden, AR
- Solid Fuel Ducted Rocket Subsystem

CEi, Sacramento, CA
- Front End Subsystem
- Aerial Target Test Set

Point of Contact:

Mark Ogren, VP of Business Development
Telephone: 480.814.6605
ogren.mark@orbital.com

Orbital Sciences Corporation
Launch Systems Group
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Chandler, Arizona 85248

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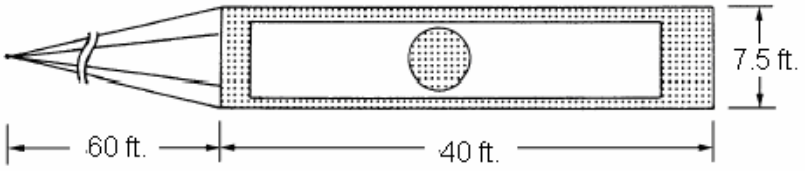
BR06007

TDU-32A/B Rigid Tow Target

Description

The TDU-32A/B and TDU-32B/B aerial banner tow targets are effective low-cost devices for air-to-air and surface-to-air gunnery training. They are constructed of nylon fabric and are rectangular in shape. The TDU-32B/B is laser retroflective and used with the laser air-to-air gunnery system (LATAGS), while the TDU-32A/B is radar reflective. The TDU-32A/B and TDU-32B/B banner tow targets have a weighted steel tow bar and bridle assembly attached to the rectangular fabric panel. There is 60-foot safety nylon webbing bridle attached between the tow bar and tow cable. Both nonradar and radar-reflective panels are 7 1/2 feet by 40 feet. For visual tracking, the panels have a 12-inch orange border and a 48-inch orange bull's eye centered on the white portion. The targets, attached approximately 1,800 feet behind the tow aircraft, are launched from the runway by standard drag takeoff procedures. Target recovery is accomplished by dropping the target in a recovery area following the mission.

Physical Characteristics



Color:	white, orange border and bull's eye

Performance Data

Maximum Towing Velocity:	250 kts.
Tow Aircraft:	F/A-18

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AIRCRAFT

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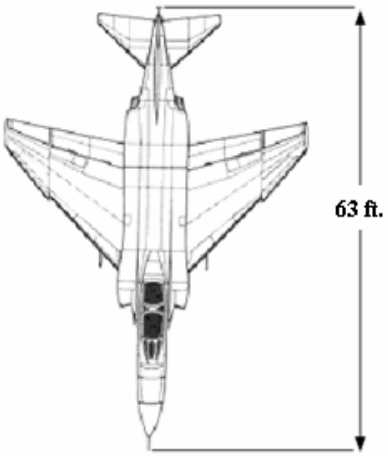
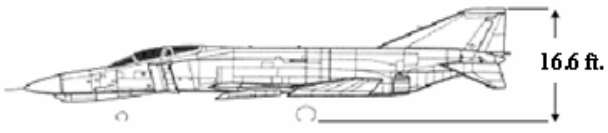
QF-4 Phantom[1]

Description

The QF-4 aircraft target is a full-scale, supersonic, high altitude, remotely controlled aircraft. It has been developed to support the test and evaluation of air to air, surface to air weapons and weapon systems. It has external stores capability including provisions for carrying external fuel tanks and special equipment pods. The remote control system features the Integrated Target Control System (ITCS) and employs nose-mounted or cockpit mounted television cameras for remote takeoff and landing. The remote control pilot flies the aircraft from a universal control console which closely duplicates the aircraft cockpit. The aircraft retains its manned configuration and is flown most of the time with a flight crew onboard for remote pilot training and other manned missions. The Tri-Service/Joint QF-4 is operational at Gulf Range and White Sands Missile Range (WSMR). To meet the Tri-Service full-scale aerial target requirements the Air Force uses the F-4E, F-4G, and RF-4C for conversion to the QF-4 configuration.

Physical Characteristics





Propeller Aircraft

Description

Mission Support

- Air Intercept Control training
- Internal Large Area Tracking Range
- Low Slow Flyer
- ASTAC

Physical Characteristics

Aircraft Specifications

- Max Speed at 30,000 ft. 295 kts
- Min Air Speed at 30,000 ft. 230 kts
- Max Air Speed at 200 ft. 250 IAS
- Min Air Speed at 200 ft. 100 IAS
- Endurance: 7.0 hours

Lear Jets

Description

Mission Support

- Air Intercept Control training
- Electronic Warfare
- Detect to Engage
- Target Tow (IR and TLX)
- Banner Tow
- Tracking Exercises

Physical Characteristics

Aircraft Specifications

- Max Speed at 30,000 ft. 460 kts
- Min Air Speed at 30,000 ft. 300 kts
- Max Air Speed at 200 ft. 300 IAS
- Min Air Speed at 200 ft. 200 IAS
- Endurance: 4.0 hours

Subsonic Aircraft

Description

Mission Support

Complex, high subsonic speed threat simulation of sea-skimming cruise missiles, or highly maneuverable threat fighter/bomber aircraft.

- **Air Intercept Control training**
- **Electronic Warfare**
- **Detect to Engage**
- **Target Tow (IR and TLX)**
- **Banner Tow**
- **Tracking**

Physical Characteristics

Aircraft Specifications

- **Type:** **Hawker Hunters**
- **Max Speed:** **620 KIAS**
- **Max Rng:** **1000 NM**
- **G-limits:** **+7.0g / -3.0g**
- **Ceiling:** **50,000 ft**
- **Max Climb Rate:** **16,000+ fpm**
- **Endurance:** **2.5 hours**

Supersonic Jets

Description

Mission Support

Complex, supersonic speed threat simulation of cruise missiles, or highly maneuverable threat fighter/bomber aircraft.

- **Air Intercept Control training**
- **Electronic Warfare**
- **Detect to Engage**
- **SFARP**
- **NSAWC**
- **Tracking**

Physical Characteristics

Aircraft Specifications

- **Type:** **KFIR**
- **Max Speed:** **1100 KIAS**
- **Max Rng:** **1300 NM**
- **G-limits:** **+7.0g / -3.0g**
- **Ceiling:** **55,000 ft**
- **Max Climb Rate:** **35,000+ fpm**
- **Endurance:** **2.5+ hours**

Description

Mission Support

Complex Multiple scenario Jammer including Radar, Comm Jamming and CHAFF dispensing Pods.

- **Airborne Refueling**
- **Exercise Support**
- **Cross Country Drags**

Physical Characteristics

Aircraft Specifications

- **Type: KC-707**
- **Max Speed: 480 KIAS**
- **Refuel Speed: 220-290 KIAS**
- **Give limits: 70-90k**
- **Endurance: 3-4 hours based on give**
- **Turn around time: 2-3 hours**
- **Crew day: 14-16 hours**

EW Aircraft

Description

Mission Support

Complex Multiple scenario Jammer including Radar, Communication Jamming and CHAFF dispensing Pods.

- **Electronic Warfare**
- **Tracking**
- **Stand Off Jammer**
- **ASMD Record/Playback**

Physical Characteristics

Aircraft Specifications

- **Type:** **G-1 Gulfstream**
- **Max Speed:** **225 KIAS**
- **Max Rng:** **1300 NM**
- **G-limits:** **+2.5g**
- **Ceiling:** **25,000 ft**
- **Endurance:** **5.0+ hours**

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SURFACE TARGETS

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High-Speed Maneuverable Seaborne Target (HSMST)

Description

The High-Speed Maneuverable Seaborne Target has an aluminum hull and a foam-filled collar that surrounds the deck area. The target has replaced the QST-33 SEPTAR (2) and the Interim HSMST to represent high speed maneuvering threats in normal sea states (up to Sea State 3), providing up to 46 knots in calm seas. The propulsion system consists of two 200 HP outboard engines.

The target may be transported to the operations area on the deck of a ship. Remote control equipment can be located ashore, or on seaborne or airborne platforms.

HSMST can accommodate augmentation systems that include passive radar return enhancement, location and navigation systems and visual enhancement. Direct live fire on HSMST is authorized for large caliber surface ship guns only. All other direct live fire requires formal TYCOM/claimant authority. HSMST's can be utilized for multiple, independent target presentations in numbers greater than 10.

Physical Characteristics

Length:	26 ft.
Beam:	9 ft.
Freeboard:	1.7 ft.
Draft:	2.7 ft.
Hull Construction:	Aluminum, Foam Filled Collar, or Non-Foamed for High Explosive

Performance Data

Maximum Speed:	46 kts. Sea State 1
	25 kts. Sea State 3

Improved Surface Tow Target (ISTT)

Description

The Improved Surface Tow Target (ISTT) is a medium weight tow target designed to be towed behind a QST-35. It was designed to provide the user with a tow target capable of simulating various threat scenarios. The ISTT allows the user to conduct direct fire and/or bomb drop operations. Additionally, the ISTT can be configured to accomplish RCS and IR signature enhancements.

It supports requirements associated with the following weapons and/or weapons systems: Mk-86 Gun Fire Control System, rockets, fleet surface gunnery exercises, IR Maverick Missile System, Hellfire, and armed helicopter for aerial gunnery.

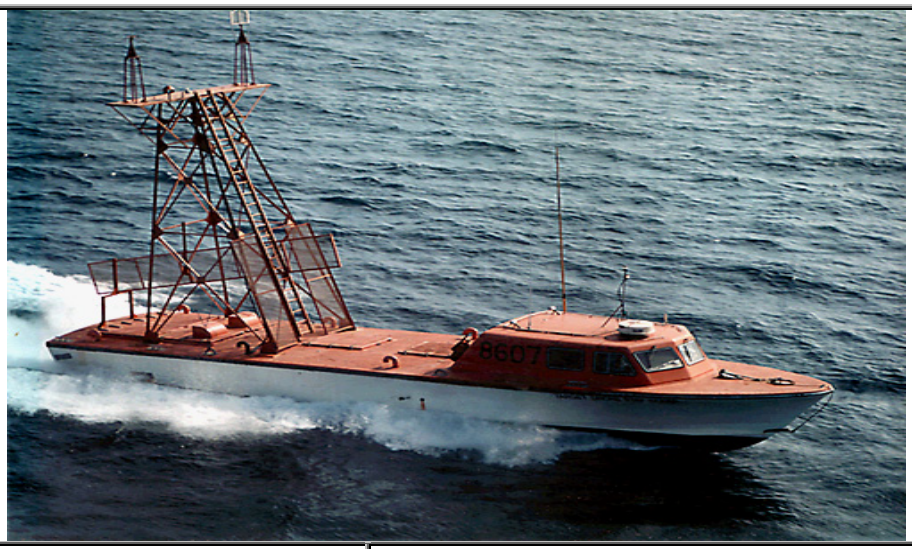
Physical Characteristics

Length:	28 ft.
Beam:	8 ft.
Freeboard:	2 ft.
Draft:	1 ft. (keel)
Hull Construction:	Fiberglass Reinforced Plastic

Performance Data

Maximum Speed:	25 kts. Sea State 1
	10 kts. Sea State 3

QST-35A Seaborne Powered Target (SEPTAR)



Description

The QST-35A Seaborne Powered Target (SEPTAR) is a high speed, remote controllable surface target designed to simulate the threat posed by patrol boats having a surface launch missile firing capability.

The QST-35A consists of a fiberglass planning hull powered by four Mercury Marine engines which produce up to 300 horsepower each. The maximum safe speed of the QST-35A is 30 knots in a very smooth sea state and declines to about 8 to 10 knots as the sea state builds to 3 or 4.

Target Augmentation Systems installed on the QST-35A are generally tailored to the particular operation it is supporting, such as radars, threat emitters, rocket launchers and scoring. There are currently 26 operational QST-35As.

Physical Characteristics

Length:	56 ft.
Beam:	14 ft.
Freeboard:	3 ft.
Draft:	2.4 ft.
Hull Construction:	Fiberglass Reinforced Plastic

Performance Data

Maximum Speed:	30 kts. Sea State 1

Ship Deployable Surface Target (SDST)

Description

The Ship Deployable Seaborne Target (SDST) is a high-speed commercial personnel watercraft. It is designed to provide a remotely controlled target, which can be augmented to present various threat scenarios.

SDST is unique in that it can be launched from Navy ships as well as any standard boat launch ramp. It can operate in at approximately 40 knots in sea state 1 and in a sea state 2 at approximately 20 knots.

Physical Characteristics

Length:	10.8 ft.
Beam:	4 ft.
Freeboard:	N/A
Draft (when static):	1.7 ft.
Hull Construction:	Fiberglass Reinforced Plastic

Performance Data

Maximum Speed:	40 kts. Sea State 1
	20 kts. Sea State 2

Williams Sled

Description

The Williams Sled Tow Target is a surface gunnery target consisting of a tubular framework mounted on two pontoons. The target is towed by approximately 5,000 feet of double-braided nylon line by a seagoing tug at approximately 10 knots or utilized as a freely drifting target. Wire fabric screens are mounted on both sides of the upper quarter of the framework to provide radar augmentation.

Physical Characteristics

Length:	27.8 ft.
Beam:	14 ft.
Freeboard:	10 in. to top of pontoon
Draft:	1.0 ft.
Hull Construction:	Steel

Performance Data

Maximum Tow Speed:	10 kts. Sea State 2

Trimaran Surface Towed Target

Description

- Can be towed behind the QST-35 or HSMST
- Can be deployed as a free floating target
- Myriad of mountable target augmentation systems

Physical Characteristics

- Fiberglass hull
- 14 ft long
- 7 ft 10 in wide
- 500 lbs

Low Cost Tow Target (LCTT)

Description

The Low Cost Tow Target (LCTT) was designed to be towed behind other remote seaborne targets. It was intended to support a variety of surface warfare (SUW) training events. Among other requirements were: able to be towed by the HSMST and larger platforms, to be self-righting, able to support missions at tow speeds from 4 to 30 knots, to be reasonably priced and survivable from small caliber impacts.

The LCTT can be towed behind any of the powered Surface Targets, but is intended primarily for use with the HSMST and the SDST.

Physical Characteristics

Length:	16 ft.
Beam:	4 ft.
Freeboard:	1.5 ft.
Draft:	0.3 ft.
Hull Construction:	Fiberglass Reinforced Plastic

Performance Data

Maximum Speed:	45 kts. Sea State 1

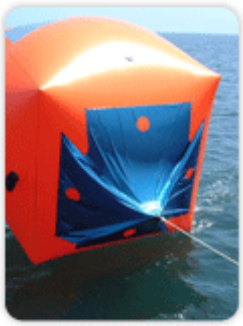
Radar Reflective Surface Balloon (Killer Tomato™)

Description

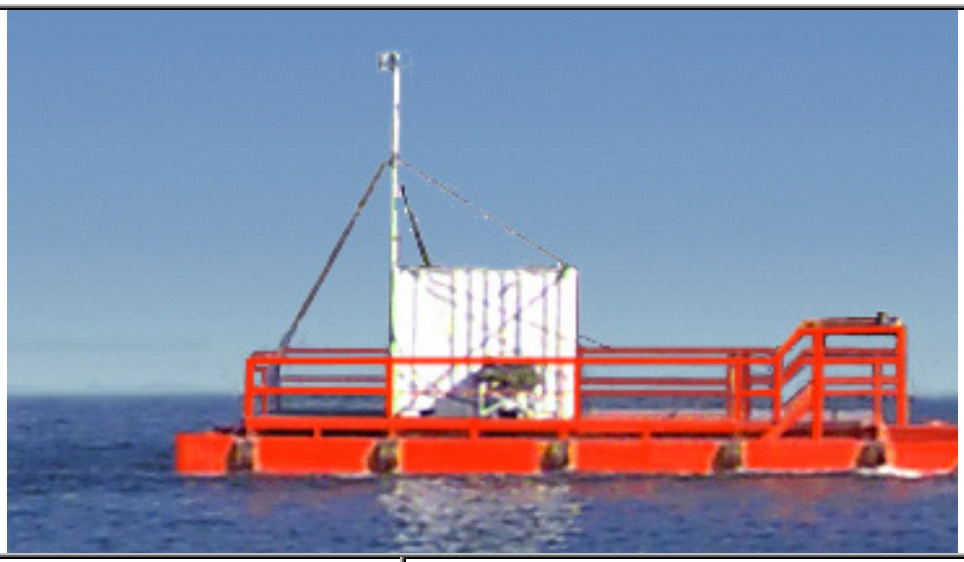
Killer Tomato™ Naval Gunnery Target balloon is an adrift target designed to stand upright on the wave surface without tumbling over in moderate sea states. Yields a radar signature to ship borne radar equipment from corner reflectors mounted in top corners of target. Can be detected 10+ miles away depending on radar equipment and sea state.

Physical Characteristics

This target has a self filling integrated drogue chute / skirt secure bottom of target to sea surface. It is air inflated, bright orange, 3 m^3 (10 x 10 x 10 feet) in size. Made with 12 mil PVC. Stainless steel metal “D-rings” for tie down, handling, minor towing, or floating trip line for recovery purposes. Integrated, self-deploying, drogue chute (no external sea anchor to buy and rig) reduces target wind drift and keeps target useful in more demanding sea state situations. Can be towed once chute is disabled or water ballast is tipped out using tie line. Radar reflective.



High-Speed Anti-Radiation Missile/Infrared Radiation (HARM/IR) Barge



Description

The HARM/IR Missile Target provides a highly survivable target for accurate missile systems. The development of this target is based on a twin pontoon or catamaran design in which each of the hulls is of welded steel construction with integral foam to improve buoyancy in the event of a breach. The enclosure contains a diesel generator electrical power source, the electronics for the Anti-Radiation Missile Emitter (ARME), and a large compartment that is heated by internal sources or by the sun. The temperature can be thermostatically controlled to provide the appropriate IR emissions.

This platform can support a wide variety of augmentation to satisfy any anti-ship or anti-radiation weapon system.

The enclosure with its vertical mast and the ARME antenna is removable for use as a HARM/IR Missile Target Augmentation Kit. This enclosure is suitable for use on any target platform large enough and with deck space to support it.

The heated enclosure can be used as an IR missile target without the ARME. This augmentation kit can be remotely activated and secured.

Physical Characteristics

Length:	45 ft.
Beam:	20 ft.
Freeboard:	1 ft.
Draft:	2 ft.
Hull Construction:	Welded Steel

Performance Data

Maximum Sea State:	3 (in tow)
	5 (when deployed)

Mk 42 Floating At-Sea-Target (FAST)

Description

The Floating At-Sea-Target (FAST) MK42 Mod 0 is a polygon (isodecahedron) shape of 20 sides approximately 6 feet in diameter. It consists of 20 equilateral triangular panels, which are reflector panels. Each reflector panel has nine integral corner reflectors which are coated with conductive paint that provides a radar reflective characteristic simulating the size of a destroyer or frigate-type vessel.

FAST is a reusable shipboard assembled target, deployable and recoverable from any Navy ship in weather conditions up to Sea State 3. FAST uses a Sea anchor to maintain stability. Once deployed, FAST can be used as a target in weather conditions of Sea State 4 or 5. In calm seas, the FAST has a visible range of up to 3.5 miles and can be used for surface to surface gunnery training.

Physical Characteristics

Height:	5.4 ft.
Width:	5.4 ft.
Hull Construction:	Aluminum/Plastic

Performance Data

N/A

TYPICAL EXISTING WEAPONS USED IN THE VACAPES RANGE COMPLEX

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Vertical Launch Anti-Submarine Rocket ASROC (VLA) Missile

Description

Description

The Vertical Launch Anti-Submarine Rocket (ASROC) (VLA) is a missile designed to deliver the Mk46 Mod 5A (SW) torpedo to a water-entry point.

Background

The VLA is intended to provide vertical-launch-capable surface combatants with an all-weather, 360-degree quick-reaction, and standoff antisubmarine weapon capability. It is carried by Aegis-equipped ships (cruisers and destroyers) equipped with the Mk41 Vertical Launching System (VLS) and the SQQ-89 ASW Combat System. VLA includes a solid-propellant booster with thrust vector control (TVC) to guide the missile from a vertical orientation through a pitch-over maneuver into a ballistic trajectory intended to deliver the torpedo to an aim point on the ocean surface. Originally deployed with the MK46 Mod 5A(S) torpedo, all VLAs have been upgraded with the Mk46 Mod 5A (SW) torpedo. This variant of the Mk46 torpedo provides improved performance in shallow water. With Initial Operational Capability (IOC) of the Mk54 Lightweight Torpedo in 2004, a program is currently underway to upgrade the VLA inventory with the Mk54 Lightweight Torpedo.

U.S. Navy Fact Sheet Last Update: 17 January 2009

Physical Characteristics

- **General Characteristics, VLA Missile**
- **Contractor:** Lockheed Martin
- **Propulsion:** Solid propellant rocket
- **Length:** 16.7 feet
- **Diameter:** 14.1 inches
- **Weight:** 1,650 pounds
- **Range:** over 10 miles
- **Warhead:** 96.8 pounds, high-explosive

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St. Louis, MO 63166
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Harpoon Block II

Description & Purpose:
Harpoon Block II expands the capabilities of the Harpoon anti-ship weapon. Harpoon, the world's most successful anti-ship missile, features autonomous, all-weather, over-the-horizon capability.

Customer(s):
Twenty-eight countries are Harpoon customers.

General Characteristics:

Length:	182.2 in. ship launch, 151.5 in. air launch
Diameter:	13.5 in.
Weight:	1,160 lb. Air configuration 1,459 lb. ASROC configuration 1,520 lb. TARTAR configuration 1,523 lb. Capsule/canister configuration
Range:	In excess of 67 NM
Propulsion:	Air-breathing turbojet engine (cruise), solid-propellant booster
Guidance:	Terminal: Active Radar Midcourse: GPS-aided inertial navigation
Warhead:	Penetration, high-explosive blast
System Elements:	Missile - Common for all launch platforms Booster - For surface, sub and land based applications Launch Support Structure and Canisters Command and Launch System - Provides engagement planning and launch control
Platforms:	Air, land, surface and sub-surface applications

Harpoon Block II provides accurate long-range guidance for land and ship targets by incorporating the low-cost inertial measuring unit from the Boeing Joint Direct Attack Munition (JDAM) program; and the software, mission computer, integrated Global Positioning System/Inertial Navigation System, GPS antenna and receiver from the Standoff Land Attack Missile Expanded Response (SLAM-ER).

The multi-mission Block II is deployable from all current Harpoon missile system platforms with either existing command and launch equipment or the commercially available Advanced Harpoon Weapon Control System (AHWCS).

Background:
Harpoon Block II is capable of executing both anti-ship and land-strike missions. To strike targets on land and ships in port, the missile uses GPS-aided inertial navigation to hit a designated target aimpoint. The 500-pound blast warhead delivers lethal firepower against a wide variety of land-based targets, including coastal defense sites, surface-to-air missile sites, exposed aircraft, port/industrial facilities and ships in port. For conventional anti-ship missions, such as open-ocean and near-land, the GPS/INS eliminates midcourse guidance errors enroute to the target area. The accurate navigation solution coupled with launch system improvements combine to offer better discrimination of target ships from islands, nearby land masses or other ships. These Block II improvements maintain Harpoon's high hit probability against ships very close to land or traveling in congested sea lanes.

Miscellaneous:
More than 7,000 Harpoons have been produced.

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August 2008

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St. Louis, MO 63166
www.boeing.com

Harpoon Block III

Description & Purpose:
Harpoon Block III takes the world's most successful anti-ship missile to a whole new level. With the addition of a robust data link system, Harpoon Block III provides in-flight target updates, positive terminal control and connectivity with future network architecture, resulting in more control after the weapon is released. The data link is the perfect addition to a missile that already provides autonomous, all-weather, over-the-horizon capability.

Customer(s):
The Harpoon Block III Weapon System will provide the U.S. Navy and its allies with Surface Warfare (SuW) capabilities from ships and aircraft. Harpoon Block III creates a highly-capable weapon for the open water and littoral warfare environment, adding Global Positioning System capability, littoral performance improvement and a precision moving target solution.

General Characteristics:

Length:	182.2 in. ship launch, 151.5 in. air launch
Diameter:	13.5 in.
Weight:	1,160 lb. air configuration 1,523 lb. surface launch capsule/canister configuration
Range:	In excess of 67 NM
Propulsion:	Air-breathing turbojet engine (cruise), solid-propellant booster
Guidance:	Terminal: Active Radar Midcourse: GPS-aided inertial navigation and In-Flight Target Updates (IFTU) via secure data link.
Warhead:	Penetration, high-explosive blast
System Elements:	Missile - Common for all launch platforms Booster - Added for surface applications Launchers - Uses existing equipment or the Harpoon Canister Launcher Command and Launch System - Provides engagement planning and launch control

Launch Platforms:	Air, surface applications
Ships	Guided Missile Destroyers (DDG) Conventional/Nuclear Guided Missile Cruisers (CG)
Aircraft	F/A-18E/F Super Hornet Multi-Mission Maritime Aircraft (MMA)

The 500-pound blast warhead delivers lethal firepower for conventional anti-ship missions, such as open-ocean, near-land or ships in port. The datalink updated Global Positioning System/Inertial Navigation System improves midcourse guidance to the target area. The accurate navigation solution allows users to discriminate target ships from islands, other nearby land masses, obstructions or ships.

Harpoon Block III will be deployable from Harpoon missile system platforms with existing command and launch equipment, the F/A-18E/F Super Hornet and the Multi-Mission Maritime Aircraft (MMA). Block III is ready to meet the over-the-horizon threat and provide our customers with the right weapon for today's environment.

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August 2008

Raytheon

AIM/RIM-7 Sparrow

Cost-Effective Medium-Range Missile System

The AIM/RIM-7 Sparrow medium-range, radar-guided missile provides a versatile and cost-effective solution for the world's air-defense needs.

Benefits

- Multimission capability
- Combat-proven air defense and air superiority
- Proven reliability
- Committed full-service support program

The AIM/RIM-7 Sparrow missile is a medium-range, all-weather, all-aspect, semiactive guided missile used in multiple roles by the United States and more than 25 international customers.

The AIM/RIM-7M model was developed around a digital monopulse seeker, which greatly improved seeker capability under heavy electronic countermeasures (ECM) and adverse weather conditions. The latest version of Sparrow, the AIM/RIM-7P, has a new higher capacity computer and uplink capability for command midcourse guidance. The AIM/RIM-7P computer incorporates a reprogrammable digital processor with software that may be modified to optimize effectiveness against enemy countermeasures. AIM/RIM-7P software continues to be upgraded for new scenarios and can be loaded via external means.

The RIM-7 Sparrow is the surface-launched (sea or land) version of Sparrow used for ship, airfield and facility self-defense. It can be launched in trainable or vertical launcher configurations. In the vertical launch variant, the RIM-7M/P uses a jet vane control to provide initial missile flight control.

Sparrow continues to be a central element in the air-defense process for the U.S. Navy and many international armies, navies and air forces. Because of its capability and flexibility, Sparrow will remain in service for many years in the future. Raytheon is committed to providing product support for the Sparrow family through 2025.

AIM/RIM-7 Sparrow

Upgradeable

Legacy AIM/RIM-7M configurations can be upgraded to AIM/RIM-7M/P configurations:

AIM-7M F1	**Baseline:** Increased memory More prelaunch messages — improve kill probability Trajectory shaping Better multiple target performance
AIM/RIM-7P Computer Kit	**All factory H-build improvements plus:** Reprogrammable circuit cards More memory and throughput increase Improved trajectory shaping performance Improved ground clutter performance Improved ECM
Full AIM/RIM-7P	**All above plus:** Improved low-altitude guidance Will accept 7P++ software

Maintenance Support

Intermediate Level	In-country test capability using the AN/DSM-162B or AN/DSM-156D test set • AN/DSM-162B test set for AIM-7 (Air Force) operations • AN/DSM-156D test set for RIM-7 (Navy/remote test) operations
Depot Level	Raytheon Missile Systems — Tucson, Arizona Sole existing full-service Sparrow depot Proven, experienced, rapid turnaround, low cost

AIM/RIM-7 Specifications

Length:	AIM/RIM without JVC	12 ft	3.66 m
	RIM with JVC	12 ft 7 in	3.85 m
Diameter:	8 in	0.2 m	
Weight:	AIM/RIM without JVC	502 lb	228 kg
	RIM with JVC	650 lb	295 kg
Wing Span:	3 ft 4 in	1 m	
Guidance System:	Semiactive compatible with continuous wave or pulsed Doppler radar illumination		
Warhead:	Annular blast fragmentation expanding continuous rod		
Fuzing:	Proximity and impact fuzing		
Power Plant:	MK-58 boost-sustain solid propellant rocket motor with manual or remote safe and arm		

Sparrow provides customers with:

- Intercepts against high- and low-altitude threats
- Intercepts of aircraft, missiles and surface targets
- Engagements of maneuvering targets in both forward and rear hemispheres
- Engagements of targets in clutter and ECM environments
- Intercepts in snap-up and shoot-down conditions
- Intercepts against multiple closely-spaced threats
- Superior operational ready rate and reliability

Raytheon is fully committed to Sparrow full-service support, including depot repair of AIM/RIM-7M/P Sparrow missiles, through 2025.

Raytheon Company
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Standard Missile-2
International Fleet Defense

SM-2

The world's premier fleet/air defense weapon.

Benefits

- Rail or vertical launch
- Inertial or command midcourse guidance
- Semiactive terminal homing
- Blast fragmentation warhead

The Standard Missile-2 (SM-2) is the latest in a long history of highly capable antiair warfare weapons. The lineage of SM-2 can be directly traced back over 50 years to the original Talos, Tartar and Terrier air defense missiles.

The current generation of SM-2, Blocks IIIA and IIIB, capitalizes on communication techniques, advanced signal processing and propulsion improvements to substantially increase the intercept range and provide high- and low-altitude intercept capability and performance against the advanced antiship missile threat.

SM-2 also employs an ECM resistant monopulse receiver for semiactive radar terminal guidance, while long-range intercepts are accomplished through the use of Inertial Midcourse Guidance (Tartar) and Command Midcourse Guidance (Aegis). The Tartar and Aegis flight profiles allow the missile to approach the target without the need for a shipboard illuminator until the terminal engagement phase. Target updates are provided through a weapon fire control system for Tartar missiles, while Command Guidance is accomplished via a link for Aegis missiles. A significant advantage of midcourse guidance is the resultant increase in firepower.

The SM-2 Block IIIB configuration incorporates a side-mounted imaging infrared seeker into the proven Standard Missile guidance system. This adjunct sensor provides a significant improvement to the missiles terminal engagement performance against stressing antiship missile threats.

SM-2 is compatible with the MK13 and MK26 rail launchers as well as the MK41 Vertical Launching System.

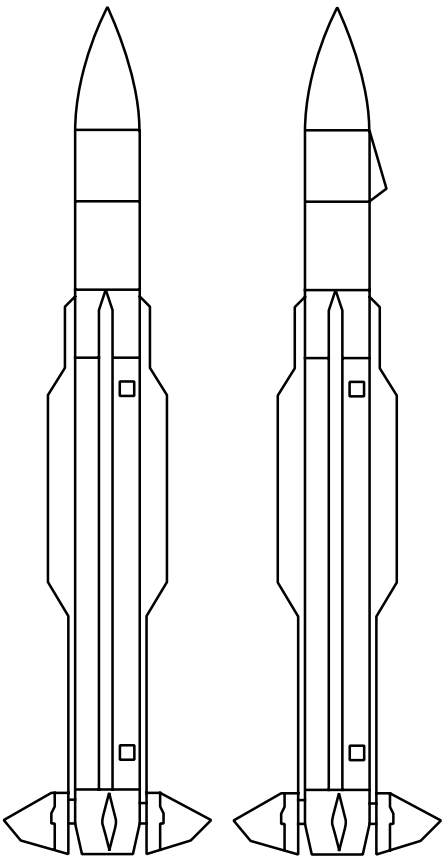
The SM-2 family continues to grow, as Canada, Japan, Germany, Korea, The Netherlands and Spain are deploying compatible surface combatants, and several other navies are in the process of defining requirements and ship configurations to support SM-2 applications.

Standard Missile-2

System/Subsystem	Characteristics
Overall System	All-weather, ship-launched, medium-to-long range, fleet air defense missile system
Airframe	Cylindrical body with ogive nosecone, cruciform trapezoidal tail control fins with inlne long chord, fixed dorsal fins immediately forward
Propulsion	Dual-thurst, solid-propellant rocket motor (MK104)
Guidance/Control	Monopulse, solid-state, semi-active radar terminal guidance with digital computer. Inertial or command midcourse guidance. Control effected through electrically activated tail fins
Fuzing	MK45 direct action and proximity fuze
Warhead	Common high-explosive fragmentation warhead (MK125)

Standard Missile-2 Specifications

Length:	15.5 ft	4.72 m
Diameter:	1.1 ft	34.3 m
Span:	3.0 ft	91.5 cm
Weight:	1,558 lb	708 kg
Range, Max:	> 50 mi	> 80.45 km
Altitude:	> 65,000 ft	> 20,000 m
Speed:	Mach 3+	
Other:	MK125 high-velocity fragmentation warhead	



SM-2 Block IIIA SM-2 Block IIIB

Final video frame from target cockpit camera.

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PD079-029

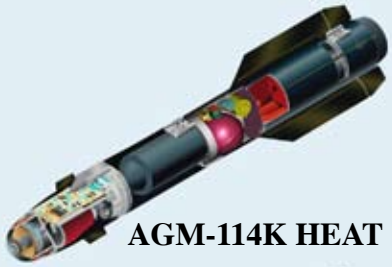
HELLFIRE II®

The HELLFIRE II modular missile system defeats advanced armor and urban point targets in the presence of severe electro-optical countermeasures. It can be launched from multiple air, sea and ground platforms, autonomously or with remote designation.

Apache, Kiowa Warrior, Cobra, Seahawk and Tiger helicopters are all equipped with the HELLFIRE system. HELLFIRE has also been successfully fired from several wheeled and armored vehicles and from various small boats and ships, as well as ground-mounted tripods. The tripod-mounted system is currently in service with the Swedish and Norwegian defense forces.

HELLFIRE II is a combat-proven weapon system for precision kill of high-value armor, air defense, ships, waterborne and fixed targets, with minimal collateral damage. The missile may be employed by lock-on before or lock-on after launch for increased platform survivability. Its multi-mission, multi-target capability with precision-strike lethality and fire-and-forget survivability provides field commanders maximum operational flexibility.

PD079-107; PD079-109

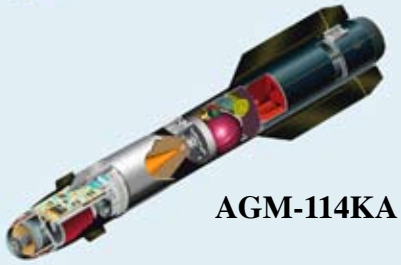


AGM-114K HEAT

AGM-114M
Blast Fragmentation

PD079-108; PD079-110

AGM-114N MAC



AGM-114KA

Specifications

Range	0.5 to 8+ km
Guidance	Semi-active laser seeker
Warheads	HEAT, augmented HEAT, blast fragmentation, and MAC
Platforms	Helicopters, tripods, boats, vehicles (from pedestal-mounted to full integration)

AGM-114K (HEAT)

Weight	45.4 kg (100 lb)
Length	163 cm (64 in)
Diameter	17.8 cm (7 in)

AGM-114KA (Augmented HEAT)

Weight	47.3 kg (104 lb)
Length	163 cm (64 in)
Diameter	17.8 cm (7 in)

AGM-114M (Blast Frag)

Weight	48.2 kg (106 lb)
Length	163 cm (64 in)
Diameter	17.8 cm (7 in)

AGM-114N (MAC)

Weight	48.2 kg (106 lb)
Length	163 cm (64 in)
Diameter	17.8 cm (7 in)

Features

- Modular HELLFIRE offers four variants: AGM-114K high-explosive anti-tank (HEAT) warhead neutralizes even the most advanced armored threats; AGM-114KA augmented HEAT warhead defeats lightly armored threats, as well as soft targets in the open; AGM-114M blast fragmentation warhead defeats ships, light armor and urban targets; AGM-114N metal augmented charge (MAC) warhead is highly effective against enclosed structures (caves and bunkers)
- Software driven – digital electronics for seeker growth applications
- Electro-optical countermeasures immunity proven by test; reprogrammable
- Effective target tracking in presence of backscatter, dust, water vapor, smoke and sea spray
- Trajectory shaping for performance in degraded weather
- Automatic target reacquisition after loss of track in low clouds
- Combat proven against a wide array of targets

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Front top: PD079-189

Raytheon

AGM-65 Maverick

Man-in-the-Loop Precision, Low Collateral Damage, Anti-tank, Anti-ship, Close Air Support Weapon

AGM-65 Maverick is the precision strike missile-of-choice for the U.S. Air Force, Navy, Marine Corps and 33 international customers.

Benefits

- Launch-and-leave capability with combat-proven high single-pass probability of kill
- Low collateral damage
- Proven capability against high-speed moving and maneuvering targets
- Modular design provides various combinations of seekers and warheads

Today's Maverick provides aircrews with launch-and-leave capability across a wide span of employment ranges and speeds. With its one-meter precision accuracy and lethal warhead, Maverick gives a high single-pass probability of success, with low collateral damage — attributes of the modern battlefield. Its modular design provides nine configurations with choices of three different seeker/guidance options, two different warheads and fuzing options, plus a rocket motor safe-arm option for naval flight deck operations.

Maverick is certified on more than 25 types of aircraft and is effective against nearly all air-to-ground target sets in battlefield, urban and maritime, including field fortifications, bunkers, tanks, armored personnel carriers, parked or taxiing aircraft, radar or missile sites, port facilities, ships, high-speed vehicles, swarming boats and other time sensitive threats. Maverick continues to evolve, providing cost effective solutions to meet current and future capability needs for network centric warfare.

TV Maverick

The first Maverick produced was the television (TV) guided AGM-65A, delivered in 1972, followed in 1975 by the AGM-65B, with scene magnification optics. AGM-65A and B versions are now being upgraded to the newer H, J, JX and K configurations for U.S. and international customers. The newer configurations incorporate modern charge-coupled-device (CCD) TV technology, circuitry and associated software to more than triple the lock-on and launch range of the original versions. The CCD seeker's sharper image gives the aircrew longer acquisition and launch ranges, allowing greater use of the aerodynamic envelope of the missile. The tracking software and cockpit display symbology are the same as those used successfully in infrared (IR) guided missiles. The superior service life of Maverick's center-aft section makes upgrading AGM-65B to AGM-65H missiles a viable and highly affordable option.

Infrared Maverick

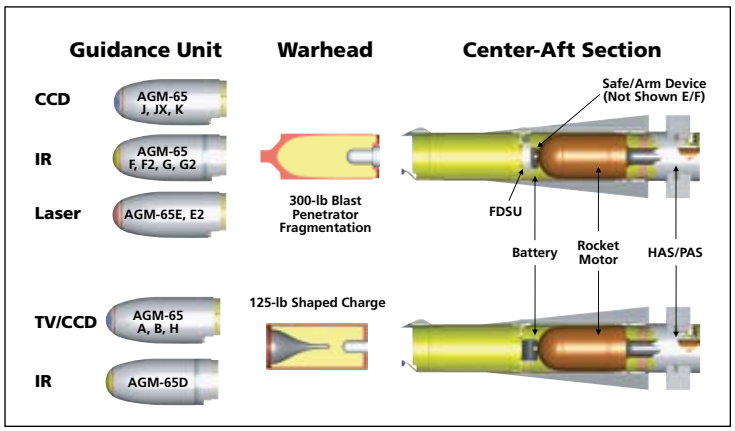
The U.S. Air Force's AGM-65D, G and G2 and the Navy's AGM-65F are equipped with IR seekers that work in both day and night situations. The IR seeker presents a TV-like image on the cockpit display as it senses small differences in heat energy between target objects and the surrounding background. The tracking software for the IR missile has evolved to effectively accommodate a wide spectrum of land and maritime targets.

Laser Maverick

The current Laser Maverick (AGM-65E) uses a semi-active laser (SAL) seeker that

Before

After



Maverick Guidance Warhead Family Chart

AGM-65 Maverick Specifications

Fuze:	Contact (Shaped-charge warhead)	Selectable Delays (Penetrator warhead)
Length:	98.0 in	249 cm
Wing Span:	28.5 in	72 cm
Diameter:	12.0 in	30.5 cm
Weights:		
125-lb Shaped Charge Warhead		
D (IR)	485 lb	220 kg
H (TV)	466 lb	211 kg
300-lb Blast Fragmentation Penetrator Warhead		
E (Laser)	645 lb	293 kg
F, F2, G, G2 (IR)	670 lb	304 kg
J, JX, K (TV)	654 lb	297 kg
Single-Rail Launcher		
LAU-117	135 lb	61 kg

Precision Against High-Speed Moving Targets

tracks laser energy reflected from a target being illuminated by a laser designator device, either airborne or ground-based. It was designed in the 1980s for defeating armored targets and providing close air support beyond the line of battle. Its analog SAL seeker provides long-range, lock-on, fire-and-forget capability that incorporates safety features for collateral damage avoidance by flying long and deactivating the warhead upon loss of laser designation. It remains extremely effective in dynamic combat operations requiring high reliability and surgical lethality.

Warheads

Two warheads are available for the Maverick. The A, B, D and H versions use a 125-pound warhead with a forward-firing, conical-shaped charge for armor penetrations. The E, E2, F, F2, G, G2, J, JX and K versions employ a 300-pound blast fragmentation/penetrator warhead that was developed for maximum effectiveness against larger, reinforced targets. Selectable fuzing gives the aircrew the option of detonating the warhead on impact or after penetration.

The Future of Laser Maverick

Raytheon is designing a new laser guidance and control section (GCS) to allow production of Laser Maverick (AGM-65E2) missiles. This next-generation Laser Maverick uses digital Semi-Active Laser (dSAL™) seeker technology that allows tighter tracking against high-speed moving targets and greater precision in tough urban environments, while minimizing collateral damage. The new Laser Maverick GCS uses key components from existing Mavericks, to include: circuit card assemblies, autopilot, and electrical interfaces. The new GCS can mate to existing Maverick center-aft sections and retains Maverick shape and mass properties to reduce cost and schedule time. The missile uses built-in-test to limit test equipment requirements. Laser Maverick requires no aircraft operational flight program changes and no change in launch aircraft. Incorporating GPS/INS features is under consideration to improve end-game accuracy, permit adverse weather employment, and offer an expanded engagement envelope.

Surgical Precision

Assured Destruction

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LASER MAVERICK

Raytheon

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AIM-132 Advanced Short-Range Air-to-Air Missile (ASRAAM)

Description

ASRAAM (Advanced Short Range Air-to-Air Missile) is the most agile, modern air-to-air missile designed to dominate the combat mission from Within Visual Range to near Beyond Visual Range. The combat concept behind **ASRAAM** is designed to give the pilot the ability to engage the enemy, fire and get away without risking himself or his aircraft in a dogfight. **ASRAAM** unique capabilities enable it to defeat all short-range missiles, existing or planned, in close-in combat.

The missile system performance is attributed to a revolutionary design concept and state-of-the-art technology providing fast reaction time from button press to end game performance and giving **ASRAAM** the highest speed of any short-range missile.

ASRAAM high speed is achieved by means of a combination of low drag and rocket motor size. By using a 166mm (6.5ins) diameter motor, compared with other missiles which use a 127mm (5ins) motor, **ASRAAM** has approximately 70% more thrust and can maintain a high speed throughout its flight time.

Designed to outmaneuver target aircraft in short-range aerial engagements and to allow launch at high off-bore sight angles during such engagements, **ASRAAM** is a highly agile missile. The exceptional maneuverability is provided by a sophisticated control system using innovative body lift technology coupled with tail control.

Physical Characteristics

• **Length**	**2.90 m (9 ft 6 in)**
• **Finspan**	**45 cm (17.7 in)**
• **Diameter**	**16.6 cm (6.5 in)**
• **Weight**	**87 kg (192 lb)**
• **Speed**	**Mach 3+**
• **Range**	**15 km (8 nm)**
• **Propulsion**	**Dual-thrust (boost/sustain) solid-fueled rocket**
• **Warhead**	**10 kg (22 lb) blast-fragmentation**

- **Length** 2.90 m (9 ft 6 in)
- **Finspan** 45 cm (17.7 in)
- **Diameter** 16.6 cm (6.5 in)
- **Weight** 87 kg (192 lb)
- **Speed** Mach 3+
- **Range** 15 km (8 nm)
- **Propulsion** Dual-thrust (boost/sustain) solid-fueled rocket
- **Warhead** 10 kg (22 lb) blast-fragmentation

Reference: http://www.mbda.co.uk/

Raytheon

AIM-9M Sidewinder

A Proven History of Success in Air-to-Air Combat

AIM-9M Sidewinder

Combat-proven, advanced infrared-tracking, short-range air-to-air missile

Benefits

- Advanced countermeasure features
- Improved identification of targets against background clutter
- Improved tracking against low-signal level targets
- Reduced-smoke rocket motor

For more than 40 years, the Sidewinder missile's effectiveness and all-aspect capabilities have been combat proven in several theaters and conflicts around the world.

Manufactured Since 1964

Raytheon has manufactured Sidewinder guidance control sections continuously since 1964 and has provided coalition nations with equipment for in-country missile repair. Since 1971, Raytheon has been the U.S. Navy's Development Industrial Support Contractor. Raytheon has delivered more than 45,000 Sidewinder guidance sections.

Enhanced Performance

The AIM-9M provides significant performance improvements over its predecessor, the AIM-9L. These include advanced countermeasure features, improved identification of targets against background clutter, improved tracking against low-signal level targets and a reduced-smoke rocket motor.

The AIM-9M is configured for easy installation on a wide range of modern tactical aircraft, including the F-4 Phantom II, F-5 Tiger, F-14 Tomcat, F-15 Eagle, F-16 Fighting Falcon, and F/A-18 Hornet fighters; the A-4 Skyhawk, A-6 Intruder, A-7 Corsair II, AV-8B Harrier II, and A-10 Thunderbolt II attack aircraft; and the AH-1 Cobra helicopter. Sidewinder is also integrated on the JAS-39 Gripen, JA-37 Viggen, FA2 Sea Harrier, Tornado GR4, and Jaguar GR3.

Raytheon's Sidewinder reliability has been thoroughly demonstrated, consistently achieving 400 percent above contractual mean time between failure requirements.

AIM-9M Sidewinder

AIM-9M Features

- Combat-proven
- Demonstrated high-kill probability
- High reliability
- Multiple applications
- Minimal size, low drag and weight
- Low per-round cost
- Simplicity
- Adaptability

AIM-9M Specifications

Length:	113 in	2.9 m
Diameter:	5.0 in	12.7 cm
Wing Span:	25 in	63.5 cm
Canard:	22.3 in	56.6 cm
Weight:	190 lb	86 kg
Warhead:	25 lb	11.3 kg
Guidance:	Passive infrared	
Fuzing:	Proximity and content	
Launcher:	Rail	

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AIM-9X Sidewinder

Fifth Generation High Off-boresight, Thrust-Vectored Air-to-Air Missile

AIM-9X Sidewinder provides first-shot/first-kill capability to ensure air combat victory.

Benefits

- Low cost of development and ownership
- Superior performance exceeds tactical requirement
- In production and in the fleet now
- Selected by numerous coalition air forces

AIM-9X Sidewinder

The AIM-9X is the newest member of the AIM-9 Sidewinder short-range missile family in use by more than 40 nations around the world. This next-generation Sidewinder missile passed operational evaluation in November 2003 and was approved for full-rate production in May 2004.

Enhanced Capability

The AIM-9X acquisition plan addresses the urgent warfighting requirement for the development and deployment of a next-generation Sidewinder to replace the AIM-9M. AIM-9X is a launch-and-leave air combat missile that uses passive infrared (IR) energy for acquisition and tracking. The AIM-9X can be employed in both near beyond visual range and within visual range arenas. Complemented by the Advanced Medium-Range Air-to-Air Missile (AMRAAM), the AIM-9X equipped warfighter has offensive firepower that is unmatched by any other weapon systems in the world. The AIM-9X program addresses the requirement for evolutionary improvements to the AIM-9 series missile through revolutionary advancements. This extends the operational effectiveness of existing inventories at an affordable cost while continuing the evolution of the AIM-9 series.

AIM-9X provides the warfighter with the following capabilities: full day/night employment, resistance to countermeasures, extremely high off-boresight acquisition and launch envelopes, greatly enhanced maneuverability and improved target acquisition ranges. The AIM-9X airframe coupled with other advanced features gives fighter pilots a significant tactical advantage in the dogfight arena. The AIM-9X uses an extremely agile thrust vector controlled airframe. Configured with a mature and high-performance staring focal plane array (FPA) sensor and existing AIM-9M components (rocket motor, warhead and fuze), AIM-9X evolutionary design is a low-cost, low-risk, all-up-round evolutionary design with robust performance. The digital design architecture of the AIM-9X provides growth capability to ensure air superiority in the future.

AIM-9X Development AIM-9X is a joint U.S. Navy and U.S. Air Force program with the Navy designated as the Executive Service. Several nations have already selected AIM-9X as their next short-range missile, and potential exists for procurement by numerous other coalition nations. The first AIM-9X air launch was accomplished in March 1999. This milestone was the first in a series of separation and control test vehicle and guided launches. From 1999 to 2001, the AIM-9X program launched 19 separation and control test vehicles and 18 guided launches from U.S. Navy F/A-18 and U.S. Air Force F-15 aircraft. Of the 18 guided firings, 14 resulted in direct hits against QF-4 unmanned drones. The AIM-9X engineering and manufacturing development (E&MD) phase completed the development of the missile

SIDEWINDER AIM-9X

AIM-9X

Unprecedented . . . Fifth Generation . . . Smarter

tactical system design and established the weapons system interface with the F-15C and F/A-18C/D aircraft and the joint helmet-mounted cueing system. U.S. government development and operational testing plans include extensive captive carry reliability testing and free-flight guided launches. In addition to the F/A-18C/D and the F-15C, AIM-9X will be integrated on the Navy F/A-18E/F and the Air Force F-15E, F-16, the Joint Strike Fighter, and the F-22 during Follow-on Test and Evaluation. AIM-9X is fully compatible with the LAU-12X series and the LAU-7 launchers.

The Threat

For more than 40 years, U.S. and coalition fighter pilots have enjoyed air superiority in short-range engagements. Now, however, current threat missiles, aircraft and environments may eclipse this advantage ... demanding a new fifth generation Sidewinder Missile — the AIM-9X.

AIM-9X – The Answer

In modern short-range air-to-air combat, first-shot/first-kill capability is necessary to ensure victory in today's high technology battlefield. Coalition fighter pilots will enter the fight with AIM-9X, a missile that retains the essence of Sidewinder heritage, while employing a fifth-generation seeker and thrust vectoring control for unprecedented performance. The Raytheon team's experience in advanced IR technologies, weapons systems integration and affordable missile production provides an AIM-9X that ensures air superiority for the 21st century.

Unprecedented

Superior Performance Exceeds Tactical Requirement

- Greatly enhanced acquisition ranges in blue sky and clutter
- IR countermeasures resistance to meet the threats of today and tomorrow
- Extremely high off-boresight capability gives the pilot the first-shot first-kill opportunity
- Highly agile airframe
- Inherent growth potential

Fifth Generation

Leadership in Advanced IR Missiles and Weapon Systems Integration Brings the Warfighter Unprecedented Technology Today — AIM-9X

Raytheon's commitment and acknowledged leadership in advanced IR missile design enabled a low-risk, low-cost development phase that ensures air superiority for the U.S. and coalition warfighter. Mature enabling technologies that include staring FPAs, adaptive compensation techniques, and advanced IR signal processing permit a low risk E&MD phase. The Raytheon AIM-9X team is a world leader in advanced digital aircraft weapons integration. This weapon system design experience includes the AMRAAM; the AMRAAM/AIM-9X compatible digital launcher; the F-14D, F/A-18E/F and F-15 advanced radars; and the F-22 weapon system. Raytheon understands the digital combat environment and the critical weapon system parameters necessary to fight and win in the pre- and post-merge arena.

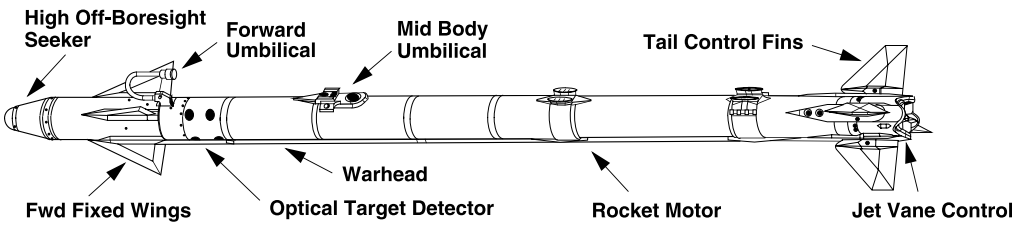
Smarter

Revolutionary Ideas Through Evolutionary Development

The critical path of any missile development is through the seeker. The payoff from leveraging an in-production seeker and Raytheon's extensive commitment to advanced fifth-generation IR technologies is a low-cost, low-risk AIM-9X development. Raytheon's advanced, mature IR FPA sensor and innovative guidance and control design combined with reuse of existing components presents an AIM-9X that is affordable and lethal. Features such as a cryoengine and an extended warranty significantly reduce the cost of ownership while increasing the AIM-9X tactical utility and availability. Raytheon's integrated product team culture and lean manufacturing techniques are combined with acquisition reform initiatives to produce an affordable, low-risk, and highly reliable AIM-9X design.

AIM-9X Sidewinder Specifications

Weight:	118 lb	85 kg
Length:	119 in	3 m
Diameter:	5 in	12.7 cm
Fin Span:	17.5 in	44.45 cm
Wing Span:	13.9 in	35.31 cm



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AMRAAM

Advanced Medium-Range Air-to-Air Missile

Advanced Medium-Range Air-to-Air Missile
Combat-proven performance and reliability.

Benefits

- Highest dependability at lowest cost of ownership
- Maximizes operational flexibility
- Multi-shot capability
- State-of-the-art active radar guidance
- Dual use from the same missile (air and surface launch)
- Cost effective life cycle support for both ATA and SL missiles
- Planned performance software upgrades to combat emerging technologies

AMRAAM

The Advanced Medium-Range Air-to-Air Missile (AMRAAM) is combat proven, scoring victories over the skies of Iraq, Bosnia, and Kosovo. AMRAAM operational reliability is measured in thousands of hours — an order of magnitude improvement beyond other systems — with mean-time-between-failure rates in excess of 1500 hours of operation. AMRAAMs are currently flown by the majority of coalition air forces. Attesting to AMRAAM reliability, the U.S. Air Force has recently exceeded one million captive carry hours while maintaining field availability well above requirements.

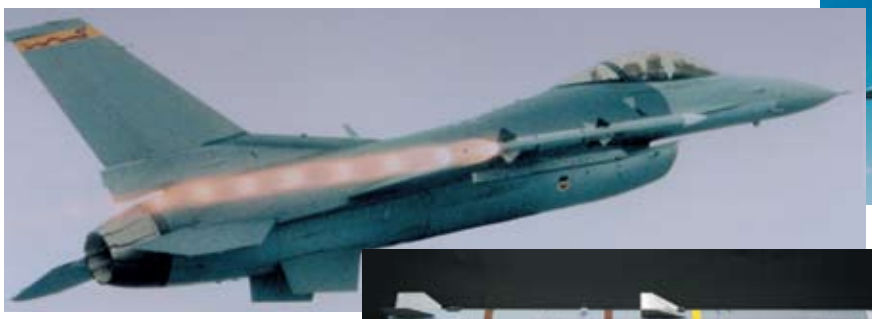
With state-of-the-art active radar guidance, AMRAAM packs unprecedented performance into a lightweight package. AMRAAM's incorporation of the latest digital technology and microminiaturized solid-state electronics makes this remarkable weapon more reliable and maintainable, resulting in the highest dependability at the lowest cost of ownership throughout the intended service life of the missile.

AMRAAM's unprecedented air combat flexibility, including its multi-shot capability, provides pilots the ability to launch at an enemy aircraft day or night, in all weather. In beyond visual range (BVR) engagements, AMRAAM is guided initially by its inertial reference unit and microcomputer. During this midcourse phase of flight, AMRAAM receives target position updates directly from the launch radar system. In the terminal phase of flight, without further reliance on the launching aircraft, the internal active radar seeker acquires the target and independently guides the missile to intercept.

AMRAAM's autonomous guidance capability provides the pilot with critical range preserving launch and leave capability. This substantially improves a pilot's overall survivability by allowing immediate maneuver following missile launch. Immediate post-launch maneuver allows the pilot faster engagement of follow-on targets, as well as the option to maximize his separation from the original engaged threat.

AMRAAM's multi-shot capability is also designed to improve pilot survivability by allowing multiple simultaneous threat engagements. AMRAAM operational capabilities include quick flyout, robust immunity to countermeasures, and improved capability attacking low-altitude targets. The low-smoke, high-impulse rocket motor effectively reduces the visual signature of the missile and thus reduces the overall probability of an enemy pilot's sighting either the launch or the incoming missile.

AMRAAM is operational on the F-22, Eurofighter, F-15, F-16, F/A-18, the German F4F, the United Kingdom's Sea



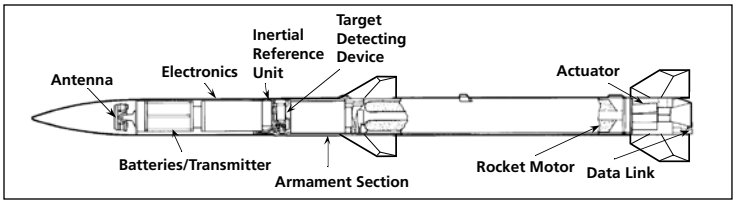
Harrier, Tornado, Harrier II Plus, the JAS-39 Gripen, JA-37 Viggen, and the Norwegian Advanced Surface-to-Air Missile System (NASAMS). Raytheon is currently integrating AMRAAM on the Joint Strike Fighter.

AMRAAM sets the global, beyond visual range standard. With more than 33 countries procuring the missile, AMRAAM has attained a level of international procurement that enriches interoperability, ensures commonality, and improves overall logistic support which ensures effective coalition operations.

AMRAAM has demonstrated equally outstanding surface-to-air performance. Surface-launch operators find AMRAAM performance extremely effective through increased long-range firepower, multiple target capability, and resilient ECCM features. The NASAMS was the first surface-launch system to take advantage of these unique air defense capabilities and has been operational with the Royal Norwegian Air Force since 1994. The Spanish army has also procured NASAMS. In 1998, NASAMs became the NATO Response Force standard for mobile/deployable netted air-defense systems to counter modern threats.

Recently, the U.S. Army approved an Operational Requirements Document (ORD) for a similar Surface-Launch AMRAAM (SLAMRAAM) capability. The Army expects to field its system in the near future. Internationally, Raytheon promotes SL-AMRAAM capability for HAWK/SHORAD upgrades and air defense systems employing the Mobility and Canister launcher on a variety of alternative vehicles.

The AMRAAM program is a model defense acquisition reform process managed by the Air-To-Air Missile Systems Wing at Eglin Air Force Base, Florida. AMRAAM is in full-rate production at Raytheon's Tucson, Arizona, facility. Raytheon's innovative evolutionary spiral development began early in the AMRAAM program. This remarkably successful spiral development process continues to extend AMRAAM's world-renowned capability well into the future. Performance, reliability, and affordability with state-of-the-art technology are Raytheon's commitments as the producer of the world's preeminent air-to-air missiles.



AMRAAM AIM-120C-7 Specifications

Length:	12 ft	3.65 m
Diameter:	7 in	17.8 cm
Wing Span:	17.5 in	44.5 cm
Fin Span:	17.6 in	44.7 cm
Weight:	356 lb	161.5 kg
Warhead:	45 lb	20.5 kg
Guidance:	Active radar	
Fuzing:	Proximity and contact	
Launcher:	Rail and eject	

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GUNS

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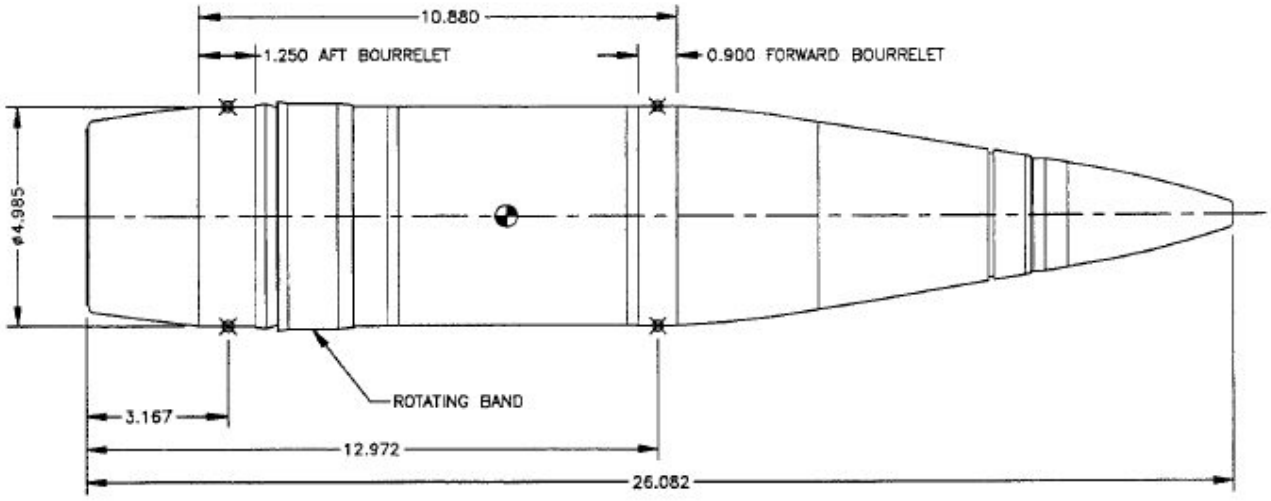
Mk-64 5” / 54 Caliber Blind, Loaded, & Plugged Naval Projectile



Description

The MK64 5 inch 54 caliber naval projectile is the basic round of ammunition for the U.S. Navy's main armament systems.

The forged steel projectiles have a long and streamlined outline, especially the ogive, together with a distinctive boat tail and flat base. The single, wide rotating band is made of copper.

The 5"/54 MK64-2 Projectile Body (MPTS) is a component of the 5"/54 Caliber Blind, Loaded and Plugged (BL&P) MK92-1 Projectile which is a training round that lacks a fuse and is filled with sand.

Physical Characteristics

Reference: www.navweaps.com, www.globalsecurity.com

76mm

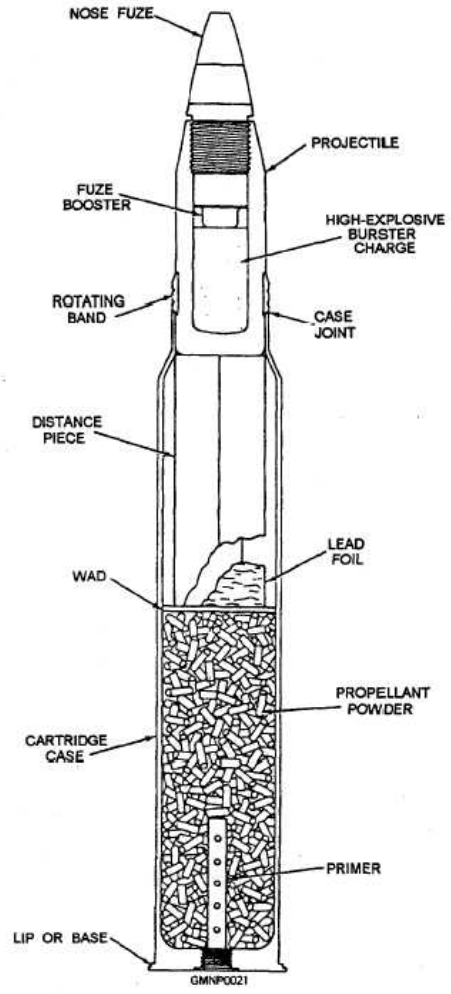
Description

All 76mm round are essentially the same in that they are made of approx. 10 lbs of iron casing with approx. 4 lbs of filler material. The current training allocation show that mostly BL-P (blind load and plug) rounds are used, MK201. As such, the 4 lbs of inert filler in the MK201 rounds is usually sand or cement. Some of the training rounds may contain spotting charges. These rounds are put together as a full up cartridge meaning they are all one piece (Projectile + Casing). The casing has approx. 4 lbs of nitrocellulose propellant.

*Note: the diagram at right shows a live round and not a BL&P round.

Reference: www.navweaps.com, www.globalsecurity.com, www.diehl-bgt-defence.de

Physical Characteristics



Ordnance Technical Data Sheet
U.S. PROJECTILE, 20 MM

Nomenclature: 20 MM Projectile
Ordnance Family: Small Arms
DODIC: A773
Propellant: Nitrocellulose/Nitroglycerin
Propellant weight: 585 grains
Item weight: 3,900 grains (case weight is 1,855 grains and the projectile weighs 1,580 grains)
Diameter: .79 in for projectile
Length: 6.62 in
Maximum Range: N/A

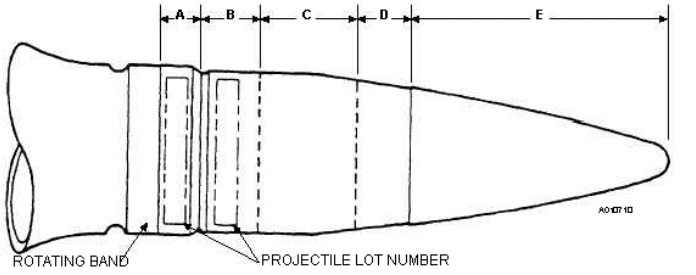
Usage: The PGU-28/B is the only projectile currently used by the Air Force and Navy for fixed wing air-to-air combat. This projectile is fired from the M61A1 gun system that is utilized by the F-14, F-15, F-16, and F/A-18 aircraft.

Description: The improved 20-mm (PGU) configuration ammunition for the M61A1/A2 aircraft guns is issued in the form of cartridges. All service cartridges have matched ballistics and are electrically primed. Initially procured ammunition is not graded, and all accepted lots are serviceable for issue and use in applicable weapons. The M103 brass cartridge cases are marked longitudinally or circumferentially with the caliber/case designation on the first line. The manufacturer symbol is on the second line. The interfix number, lot serial number, and year of manufacture are on the third line. All projectiles have essentially the same external configuration. The rotating band is copper alloy swaged into a circumferential groove near the aft end of the steel body. Ammunition type is identified by the color the projectile is painted and by the lettering on the body of the projectile.

PGU-27/B Target Practice (TP)
The PGU-27/B projectile consists of a steel body with a solid aluminum nosepiece swaged or crimped to the steel body. This cartridge has no explosive filler in the projectile. The cartridge is used in practice firing, for boresighting of weapons, and testing of new guns. The projectile shape and ballistic properties are similar to those of other PGU configuration ammunition.

PGU-28/B Semi-Armor Piercing High Explosive Incendiary (SAPHEI)
The PGU-28/B projectile consists of a steel body with an internal cavity filled with a sponge Zirconium pallet, composition A-4 and RS 40 incendiary mix. The aluminum nose contains RS 41 incendiary mix and is swaged to the steel body. This cartridge is for use against aircraft and light material targets, and functions with semi-armor piercing, high explosive, and incendiary effect.

PGU-30/B Target Practice-Tracer (TP-T)
The PGU-30/B consists of a steel body with an aft cavity containing the tracer pellet. The aluminum nose is swaged or crimped to the steel body. Tracer A tracer pellet is loaded into a cavity machined in the base of the TP-T projectile used in the assembling of the PGU-30/B cartridge. The heat and pressure of the propelling charge ignite the tracer pellet. The tracer is visible for approximately 3.2 seconds during projectile flight. This cartridge is virtually the same as the PGU-27/B projectile, except it incorporates a tracer in the base of the projectile.



Projectile Type	Color of Painting					Color of Marking
	Locations (See Figure 7-10)					
	A	B	C	D	E	
Target Practice (TP) PGU-27/B	No paint (copper)	Blue	Blue	Blue	Blue	White
Semi-Armor Piercing High Explosive Incendiary (SAPHEI) PGU-28/B	No paint (copper)	Black	Yellow	Red	No paint (chromate)	White
Target Practice Tracer (TP-T) PGU-30/B	No paint (copper)	Blue	Blue	Blue	Blue	White with Orange T's (location D)

References: The Aviation Ordnanceman; TRI-DDS website; MIDAS; Global Security.org.

20MM MK 149 (APDS)

PHALANX CIWS (CLOSE-IN WEAPON SYSTEM)

- General Dynamics Ordnance and Tactical Systems is the Sole Developer and Qualified Producer of the MK149 20mm Armor-Piercing, Discarding Sabot Cartridge
- General Dynamics Ordnance and Tactical Systems has Produced in Excess of 20 Million Rounds of Ammunition for the U.S. NAVY's PHALANX Anti-Ship Missile Defense System
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- Increased Impact and Residual Energy at Target over the M50 Series
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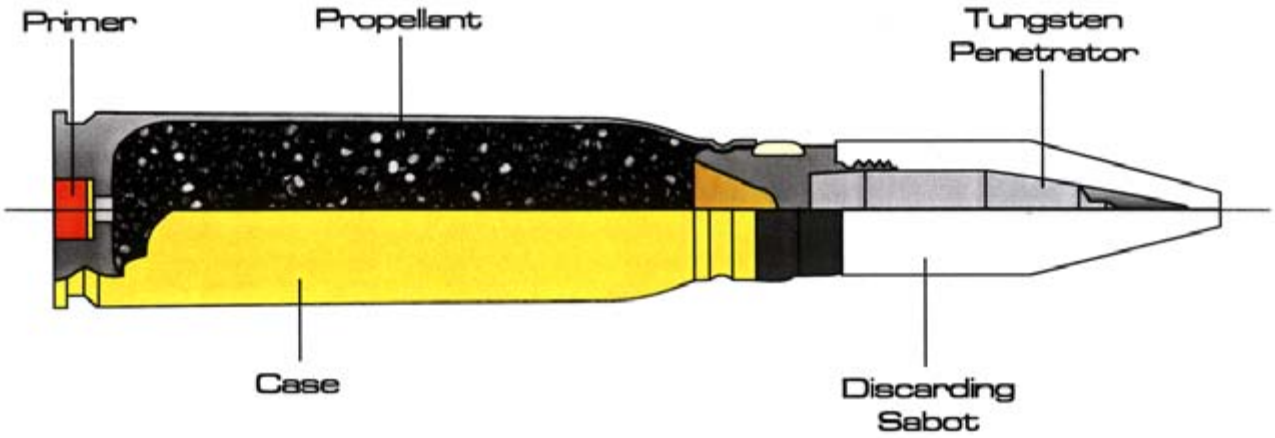
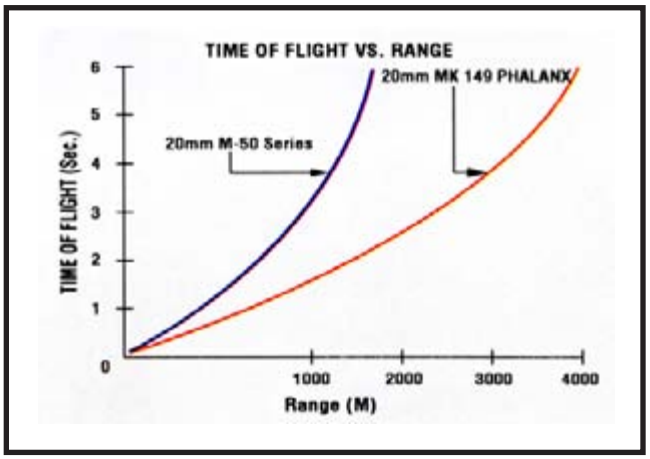
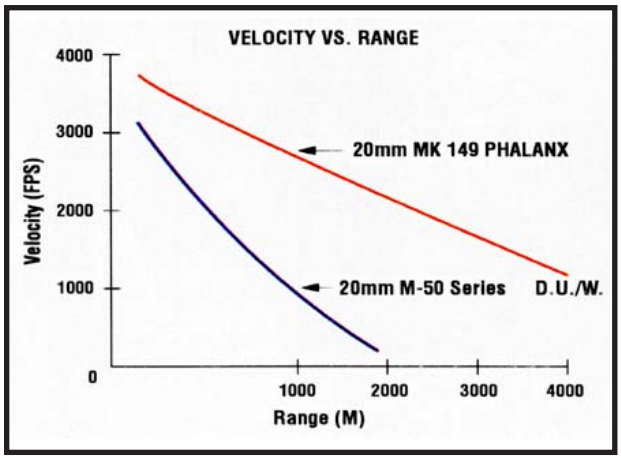
U.S. NAVY PHALANX AMMUNITION

20MM APDS-MK149

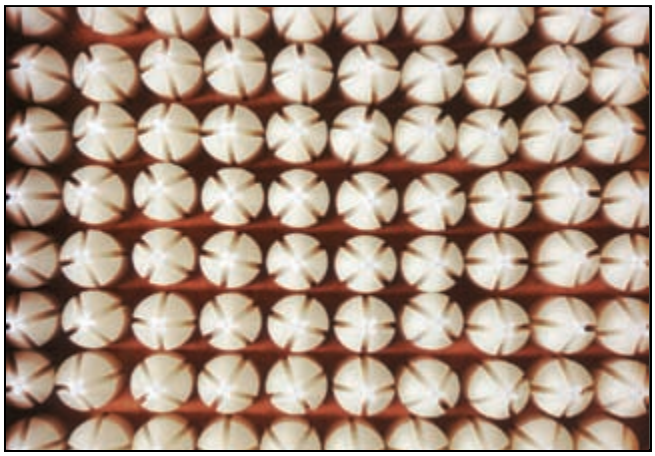




Short Time of Flight to Target



Optimized Exterior Ballistic Performance



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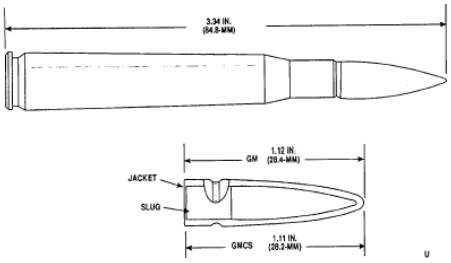
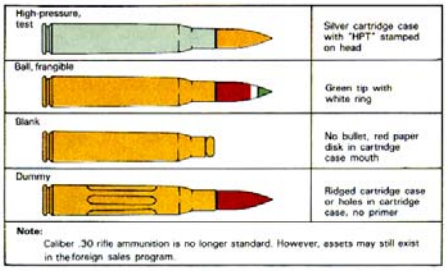
Ordnance Technical Data Sheet

U.S. Cartridge, .30 Caliber Ball, M2





Caliber .30 Cartridges, Colors and Shapes.

Nomenclature:	M2 Cartridge, .30 Caliber, Ball
Ordnance Family:	Small Arms
DODIC:	A212
Filler:	Single or Double Base Powder*
Filler weight:	Mission dependent
Item weight:	26.96 g (416 gr)
Diameter:	7.62 mm (.30 in)
Length:	84.80 mm (3.34 in)
Range:	3475 m (3800 yds)

Usage: Machine Guns, Caliber .30, M37, M1919A4 and M1919A6; and Rifle, Caliber .30, M1. The cartridge is intended for use against personnel or unarmored targets.

Description: Ball Cartridge. The bullet is copper clad and identified by a plain bullet tip.

Reference: TM 43-0001-27

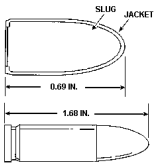
* **Single Base Propellant:** Single base propellants contain nitro cellulose as their chief ingredient. Single-base compositions are used as low-pressure propellants, such as those used in small arms ammunition. They may contain a stabilizer, inorganic nitrates, nitro-compounds, metallic salts, metals, carbohydrates and dyes.

Double Base Propellant: Double base propellants contain nitrocellulose and a liquid organic nitrate, such as nitroglycerine. As with single base, stabilizers and additives may be present. Double base propellants are used in cannon, small arms, mortars, rockets, and jet propulsion units.

Ordnance Technical Data Sheet

U.S. Cartridge .30 Caliber, Ball

CARTRIDGE, CALIBER .30, CARBINE, BALL, M1



Nomenclature:	Cartridge, .30 caliber, Ball
Ordnance Family:	Small Arms Ammunition
DODIC:	A182
Propellant:	Single or Double Base Powder**
Filler:	Lead or Copper Clad Lead
Filler weight:	Not Provided
Item Weight:	Not Provided
Diameter:	7.62 mm (.30 in)
Length:	42.67 mm (1.68 in)
Maximum Range:	2012.00 m (2,200 yds)
Fuze:	Percussion

Usage: Standard general purpose small arms ammunition for the M-1 and M1A1 .30 caliber Carbine.

Description: The cartridge case is brass comprised of 70 percent copper and 30 percent zinc. The bullet is copper clad lead. The propelling charge is either single or double base powder. Ball ammunition is unpainted; tracer ammunition has the tip painted either orange or red.

Reference: Army Technical Manuel TM 9-1300-200.

* Single-base propellant - Contains only one explosive ingredient, normally nitrocellulose.

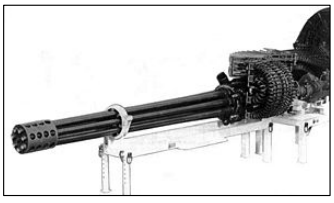
* Double-base propellant - Contains two explosive ingredients, commonly nitrocellulose and nitroglycerin.

Ordnance Technical Data Sheet
U.S. PROJECTILE, 30 MM

Nomenclature: 30 MM Projectile
Ordnance Family: Small Arms
DODIC: B109
Propellant: Nitrocellulose
Propellant weight: .083lbs
Item weight: 360 grams
Diameter: 30 mm
Length: 113 mm or 173mm
Maximum Range: 4500 m

Usage: The 30mm lightweight family of ammunition was developed to optimize the air-to-ground mission of the U.S. Army AH-64 Apache helicopter. It is also used by the A-10. Tanks are the common real world target for 30 mm rounds.

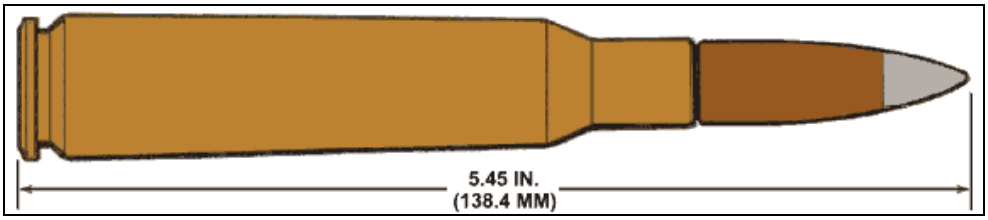
Description: Two airframes use a 30 mm round. The AH-64 Apache Helicopter which uses the M230 chain gun (see picture). The M788 is the practice 30mm round employed and is 30 x 113 mm with an effective range or 1,500 m and a max range of 4,500 m. Several ordnance variants are available, including: M788 Target Practice (TP); M789 High Explosive Dual Purpose (HEDP); and M799 High Explosive Incendiary (HEI).



The A-10 uses the GAU-8A Avenger, 30mm cannon (See picture). It uses PGU-15 30 x 173mm 30 mm ammo. The training round is the PGU-15B. The gun fires 3,900 rpm (rounds per minute).

References: TRI-DDS website; MIDAS; Global Security.org.

Ordnance Technical Data Sheet
U.S. Cartridge, .50 Caliber, Ball M8



Nomenclature: M8, Cartridge, .50 Caliber, Ball
Ordnance Family: Small Arms
DODIC: A576
Propellant: WC860 **-** Single or Double Base Powder*
Filler: Lead, Steel and/or Copper cladding
Filler weight: ± various
Cartridge weight: 1764 grams
Diameter: 12.70 mm (.50 in)
Length: 138.40 mm (5.45 in.)
Projectile Weight: 622.5 grams
Velocity: 2,910 fps (887 mps)

Usage: Machine Guns, Caliber .50, M2 and M85. The cartridge is intended for use against personnel or unarmored targets. Used by M2 and M85 machine guns, and the M107 Long Range Sniper Rifle. The cartridge combines the functions of the M2 armor piercing bullet and the incendiary bullet, and is used against flammable targets and light-armored or unarmored targets, concrete shelters, and similar bullet-resisting targets.

Description: Ball Cartridge. The cartridge is identified by an aluminum bullet tip.

Single Base Propellant: Single base propellants contain nitro cellulose as their chief ingredient. Single-base compositions are used as low-pressure propellants, such as those used in small arms ammunition. They may contain a stabilizer, inorganic nitrates, nitro compounds, metallic salts, metals, carbohydrates and dyes.
Double Base Propellant: Double base propellants contain nitrocellulose and a liquid organic nitrate, such as nitroglycerine. As with single base, stabilizers and additives may be present. Double base propellants are used in cannon, small arms, mortars, rockets, and jet propulsion units.

Reference: Army Technical Manual TM 43-0001-27; Midas; navy.mil

Ordnance Technical Data Sheet
U.S. Cartridge, 7.62 mm, Ball M80

Nomenclature: U.S. Cartridge, 7.62 mm, Ball M80
Ordnance Family: Small Arms
DODIC: A130
Propellant: 46 grams – WC846 **-** Nitrocellulose/Nitroglycerin
Cartridge weight: 392 grams
Projectile weight: 146 grams
Diameter: 7.62 mm
Cartridge Length: 2.8 in (71.1 mm)
Velocity: 2,750 fps (838 mps)

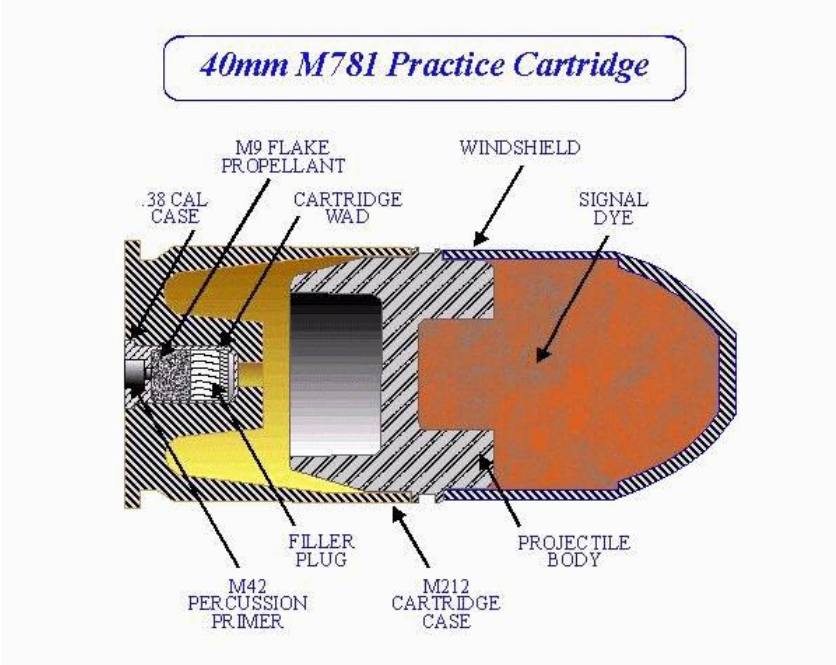
Usage: This cartridge is intended for use against personnel and unarmored targets.

Description: Full metal jacketed bullet and brass cartridge case, center-fired NATO standard small arms.

Single Base Propellant: Single base propellants contain nitro cellulose as their chief ingredient. Single-base compositions are used as low-pressure propellants, such as those used in small arms ammunition. They may contain a stabilizer, inorganic nitrates, nitro-compounds, metallic salts, metals, carbohydrates and dyes.
Double Base Propellant: Double base propellants contain nitrocellulose and a liquid organic nitrate, such as nitroglycerine. As with single base, stabilizers and additives may be present. Double base propellants are used in cannon, small arms, mortars, rockets, and jet propulsion units.

References: ORDATA Online, MIDAS, Army Technical Manuel TM 9-1306-200, Navy.mil

M781 40mm Practice round



Description

This round is blue zinc or aluminum with white markings. It is used for practice and produces a yellow or orange signature on impact

Physical Characteristics

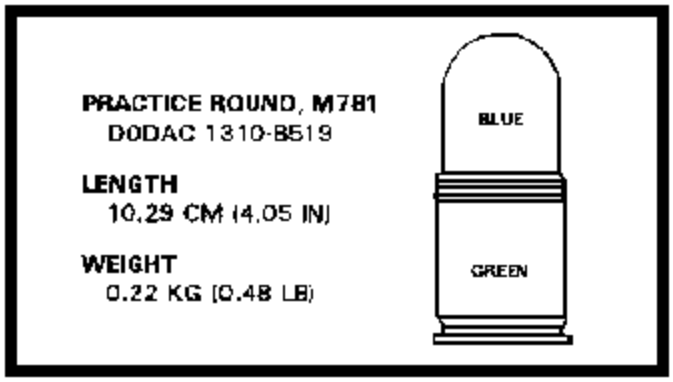


Figure 3-13. Practice round.

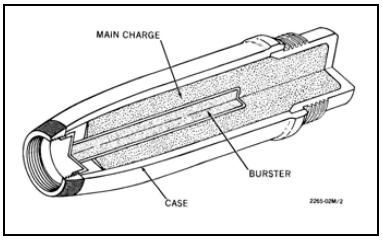
Ordnance Technical Data Sheet
U.S. ROCKET Warhead, 2.75 in, Practice, M156

Nomenclature: Rocket 2.75 Inch Smoke, WP, M156
Ordnance Family: Rockets
DODIC: H486
Propellant: Nitrocellulose/Nitroglycerin
Explosive weight: 999 grams
Item weight: 4000 grams
Diameter: 70 mm
Length: 328 mm
Frag Range: 300 m

Usage: These are non-explosive practice munition warheads used with 2.75-inch practice rockets for target practice, or with dummy rockets for instruction and display. This is a white phosphorus smoke warhead used primarily for target marking.

Description: The warhead is painted and marked in either of the following methods: (1) New color coding is light green overall, with a yellow band around the nose, and nomenclature and loading information stenciled on the side in light red. (2) Older color coding is olive drab overall, with either a light-green band around the nose or the entire nose area painted light green, and a yellow band directly behind the light-green area. The letters WP are stenciled in light red on the light-green area, and nomenclature and loading information stenciled on the side, in black. The warhead is steel.

Hazards: Cocked-Striker; EMR; Explosive (HE); Frag; Movement; Proximity (VT); White Phosphorus (WP)



Reference: ORDATA Online.

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AIR DEPLOYED UNDERWATER CHARGES

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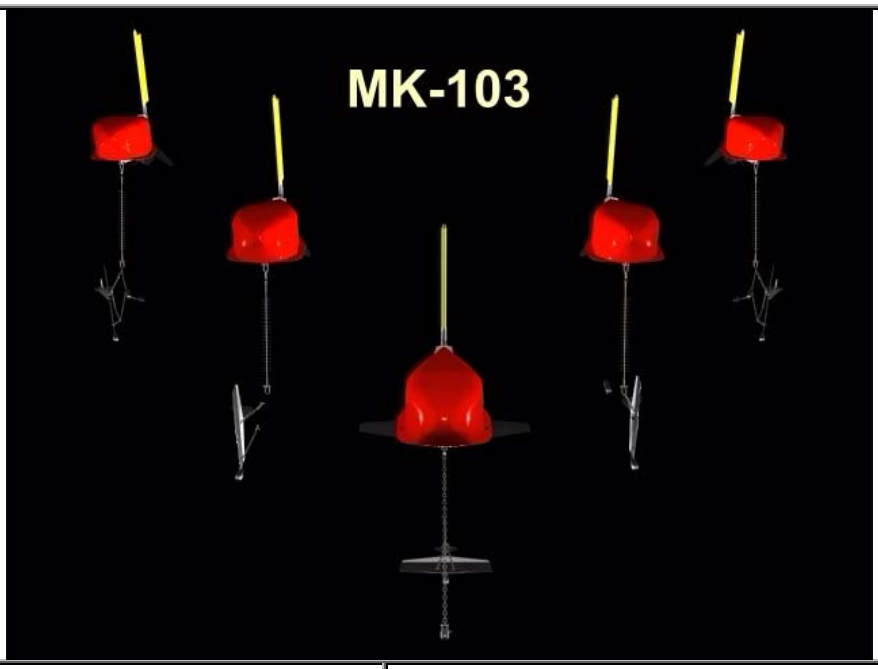
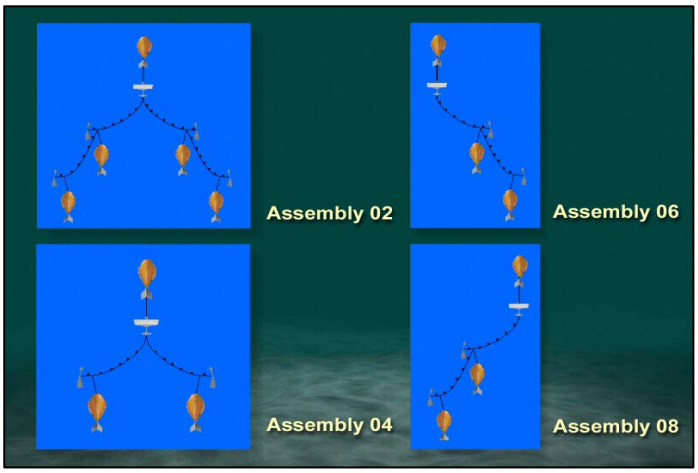
Mk-103 Mine Countermeasure System



Description

The MK-103 Mine Countermeasure Array is an extremely effective towed array used to cut the mooring lines of moored mines. Once the mine has been cut free from its mooring, it is then neutralized by an Explosive Ordnance and Disposal team. The MK-103 Mine Countermeasure System uses a towed cable system outfit with MK-17 explosive cutters set at different distances along the cable. The system has four operational depths and is towed at a speed of 12 knots.

Physical Characteristics



Raytheon

AN/ASQ-235 Airborne Mine Neutralization System (AMNS)
for Optimum Warfighter Safety

AMNS neutralizes anti-shipping mines safely and efficiently by operating from sea- and land-based MH-60S helicopters.

Benefits

- Neutralizes moored and bottom mines (four per MH-60S sortie)
- Accelerates the neutralization process by moving quickly from detection to engagement
- Minimizes human involvement in hazardous minefields; divers and ships are not needed to detonate mines
- Integrates seamlessly with existing MH-60S AMCM equipment
- Positively identifies bottom mines through use of real-time video
- Operates from the air to optimize personnel safety
- Designed to rigorous military standards
- Small logistic footprint

The Navy Standard for Airborne Mine Neutralization

Seaborne mines continue to menace naval and maritime forces worldwide. Mines are used to attack ships approximately 200 times more than any other weapon. Raytheon's Airborne Mine Neutralization System (AMNS), the U.S. Navy's standard for organic airborne mine clearance, has been designed to counter this threat.

AMNS neutralizes moored and bottom mines while operating from sea- and land-based MH-60S helicopters. By using helicopters as a central platform, mine clearance has not only become safer, but nearly 10 times more efficient.

Mines are first identified by the AN/AQS-20A sonar system or other mine countermeasure assets. The AMNS then identifies the location of the mines and neutralizes the target.

AMNS consists of the following removable mission equipment:

- Launch and Handling System
- Common neutralizer vehicle
- Common console display
- Carriage, Stream, Tow and Recovery System

Launch and Handling System Easily Deployed From Aircraft

The mine neutralization begins with the deployment of the Launch and Handling System (LHS) from the MH-60S helicopter. Because it's compatible with MH-60S mechanical and electrical interfaces and supports easy on/off kit reconfiguration, the LHS is easily deployed from the aircraft.

The highly effective LHS integrates many diverse high-tech capabilities into a single system, including a stable platform from which to launch the neutralizer vehicle.

Common Neutralizer Vehicle Ensures Safe Handling

The neutralizer vehicle is released from the LHS under the control of the sensor operator on the aircraft. The operator guides the lightweight (15.5 kg) and highly maneuverable vehicle to the target location using on-board sonar. After the target is viewed and positively identified with an on-board video camera, the operator fires an armor-piercing warhead from the vehicle to neutralize the mine.

The neutralizer's state-of-the-art electronics and sensors also provide a robust, high-speed fiber optic data link, track responder and echo sounder. An inert unit with strobe light, acoustic beacon and recovery section is used for training.

The Archerfish™ has been selected by the U.S. Navy as the common neutralizer vehicle.

Airborne Mine Neutralization System (AMNS)

Common Console Is Human System Interface

The common console, which is aft of the helicopter's cockpit, interfaces with a number of important functions during the mine neutralization process, including sensor operator control, vehicle control, sonar, video and status.

The console displays timely and accurate information about the positions of the target and the neutralizer vehicle. It also displays the bearing and range from the LHS to the neutralizer. This information allows the sensor operator to monitor and adjust the neutralizer's approach to the target.

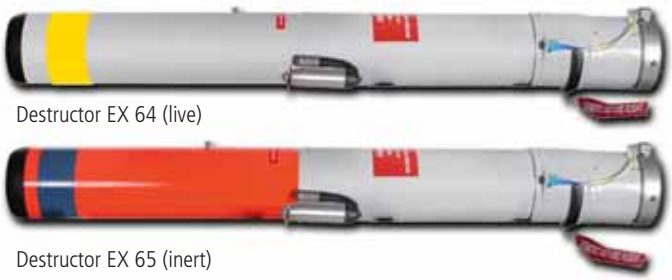
Reliable Recovery Is Ensured

Each MH-60S helicopter is outfitted with a removable Carriage, Stream, Tow and Recovery System (CSTRS), which is used to deploy the Launch and Handling System (LHS) from the aircraft and recover it from the water. The CSTRS, which is also used on the AN/AQS-20A, consists of a winch, AQS-20A tow cable and guillotine.

Designed to Rigorous Safety Standards

Numerous safety precautions were built into the design of the AMNS. The system's key components are designed and tested to strict military standards for explosive system devices. The U.S. Navy has also successfully conducted extensive training and simulation exercises to validate the system's capability and reliability.

Common Neutralizer



Destructor EX 64 (live)

Destructor EX 65 (inert)

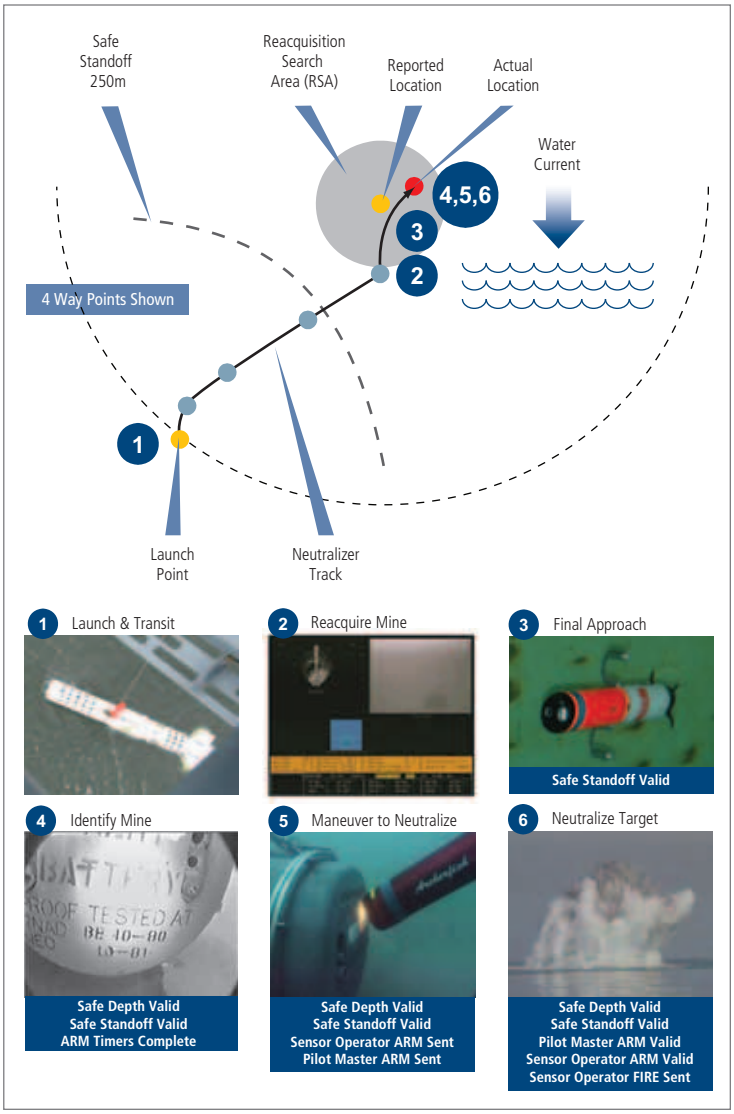
Launch Handling Subsystem Specifications

Length	11.3 ft
Width	15.5 in. diameter
Weight	753 lb (air) with 4 neutralizers, 606 lb empty
	223.5 lb (water) with 4 neutralizers, 217 lb empty
Power	0.6 kW

Destructor Specifications

Weight	36.5 lb (in air)/0.9 lbs (in water)
Length	41.3 in. (after launch)
Diameter	5.3 in. (hull)
Speed	-0.5 to ≥ 6 knots
Fiber Optic Cable	2,000 m (Ntr Spool)/1,500 m (LHS Spool)
Battery	16.8 V, 20 Ah Lithium-ion

Typical Mine Neutralization Scenario



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EOD DIVER DEPLOYED UNDERWATER CHARGES

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M112 Composition C4 Block Demolition Charge

Description

M112 composition C-4 block demolition charge is used primarily for cutting and breaching all types of demolition work. Because of its moldability and high brisance, the charge is ideally suited for cutting irregularly shaped targets such as steel. The adhesive backing allows the charge to be attached to any relatively flat, clean, dry surface that is above freezing point.

Physical Characteristics

The M112 block demolition charge consists of 1.25-pounds of Composition C4 packed in a Mylar-film container with a pressure-sensitive adhesive tape on one surface. The tape is protected by a peelable paper cover. In blocks of recent manufacture, Composition C4 is white and packed in an olive-drab, Mylar-film container. Relative effectiveness factor is 1.34.

Reference: www.globalsecurity.com, www.omniexplosives.com

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BOMBS

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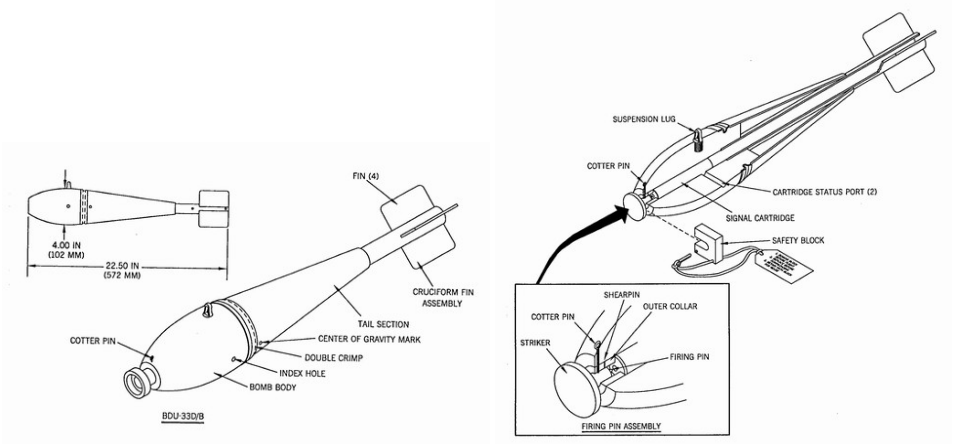
Ordnance Technical Data Sheet

U.S. Bomb, Practice, 25 lb, BDU 33D/B



Nomenclature:	BDU-33D/B Practice Bomb
Ordnance Family:	Bomb
DODIC:	Not Provided
Filler:	Signal Cartridge (see MK 4 Signal Cartridge)
Filler weight:	14.00 g (.49 oz)
Item weight:	11.00 kg (24.25 lbs)
Diameter:	102.00 mm (4.01 in)
Length:	527.00 mm (20.75 in)
Maximum Range:	Not Provided
Fuze:	Impact

Usage: These bombs are signal-generating; impact- or impact-inertia-fired practice/simulated bombs.

Description: The BDU-33D/B bombs are painted light blue; additionally, the BDU-33D/B has white stenciled markings only.

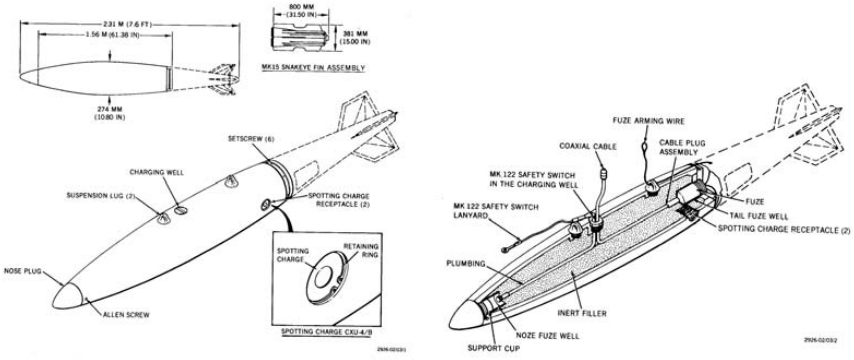
Reference: ORDATA Online.

***Titanium tetrachloride** is a colorless to pale yellow liquid that has fumes with a strong odor. If it comes in contact with water, it rapidly forms hydrochloric acid, as well as titanium compounds.

Titanium tetrachloride is not found naturally in the environment and is made from minerals that contain titanium. It is used to make titanium metal and other titanium-containing compounds, such as titanium dioxide, which is used as a white pigment in

Ordnance Technical Data Sheet

U.S. Bomb Unit, 500 lb, Simulated, BDU-45/B, Quiet Bomb



Nomenclature:	BDU-45/B, Bomb Unit, 500 lb, Simulated, Quite Bomb
Ordnance Family:	Bomb
DODIC:	Not Provided
Filler:	None
Filler weight:	Not Provided
Item Weight:	239.00 kg (500 lbs)
Diameter:	274.00 mm (10.79 in)
Length:	1.54 m (5.05 ft)
Maximum Range:	Not Provided
Fuze:	None

Usage: The bomb is a low drag type of the same size and shape as a Mk 82 bomb container. This is a signal generating simulated bomb used for pilot proficiency training with provisions for visual spotting of bombing accuracy. The bomb is loaded with an inert filler and contains no hazardous components. For the hazards of the fuze(s), TDD or sensing element, spotting charge adapter, and spotting charges refer to the appropriate reference.

Description: The bomb is painted blue with the designation BDU-45/B stenciled in white on the forward end of the bomb. Early models of the bomb are stamped with Mk 82 designations between the suspension lugs and with Mk 82 designation, ordnance drawing number, and loading data stenciled in white on the side of the bomb. The bomb fin assembly is painted olive drab.

Reference: ORDATA Online.

Ordnance Technical Data Sheet
U.S. BOMB, PRACTICE BDU-48/B

Photography by John Pitcher, 2007.

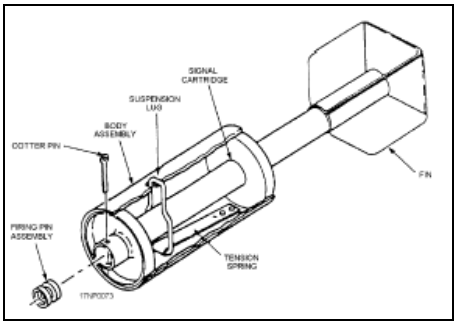
Nomenclature:	U.S. Bomb, Practice, BDU-48/B
Ordnance Family:	Bomb
DODIC:	E962
Filler:	Signal Cartridge, MK-4 MOD 3 or CXU-3A/B
Filler weight:	Not Provided
Item weight:	9.8 lbs
Diameter:	98.00 mm (3.86 in)
Length:	562.00 mm (22.13 in)
Maximum Range:	Not Provided
Fuze:	Impact or impact-inertia fired

Usage: These are air-dropped, impact or impact-inertia-fired signal-generating practice bombs used to train aircrews in the bombing of surface targets.

Description: The BDU-48/B is a 10-pound practice bomb. It is a thin-cased cylindrical bomb used to simulate retarded weapon delivery. The bomb is composed of the bomb body, a retractable suspension lug, a firing assembly, and box-type conical fins. The firing device consists of a firing pin assembly and a cotter pin. The BDU-48/B is painted blue. Identification nomenclature is stenciled in white letters on the bomb body. The bomb can use signal cartridge MK-4 Mod 3, or CXU-3A/B. While handling or transporting bombs, loaders should avoid placing their bodies in line with either end of the bomb.

***Titanium tetrachloride** is a colorless to pale yellow liquid that has fumes with a strong odor. If it comes in contact with water, it rapidly forms hydrochloric acid, as well as titanium compounds. Titanium tetrachloride is not found naturally in the environment

and is made from minerals that contain titanium. It is used to make titanium metal and other titanium-containing compounds, such as titanium dioxide, which is used as a white pigment in paints and other products and to produce other chemicals. Military use it as a component of spotting charges. Titanium tetrachloride is very irritating to the eyes, skin, mucous membranes, and the lungs. Breathing in large amounts can cause serious injury to the lungs. Contact with the liquid can burn the eyes and skin.



HAZARDS:

- Explosive
- Red phosphorus or Titanium tetrachloride
- Smoke/incendiary

References: ATSDR; The Aviation Ordnanceman; TRI-DDS website; MIDAS; Global Security.org.

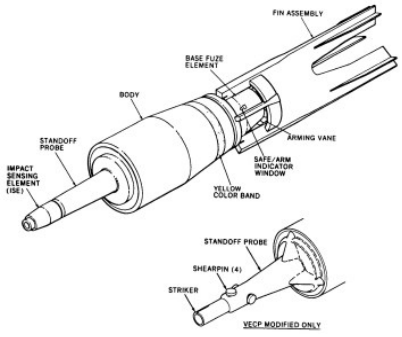
MK-20 Rockeye

Description

The MK-20 Rockeye is a free-fall, unguided cluster weapon designed to kill tanks and armored vehicles. The system consists of a clamshell dispenser, a mechanical MK-339 timed fuze, and 247 dual-purpose armor-piercing shaped-charge bomblets. The bomblet weighs 1.32 pounds and has a 0.4-pound shaped-charge warhead of high explosives, which produces up to 250,000 psi at the point of impact, allowing penetration of approximately 7.5 inches of armor. Rockeye is most efficiently used against area targets requiring penetration to kill. Fielded in 1968, the Rockeye dispenser is also used in the Gator air-delivered mine system. During Desert Storm US Marines used the weapon extensively, dropping 15,828 of the 27,987 total Rockeyes against armor, artillery, and antipersonnel targets. The remainder were dropped by Air Force (5,345) and Navy (6,814) aircraft.

Physical Characteristics

Length:	7.5 ft (2.3 m)
Diameter:	13.2 in (335 mm)
Tail Span	2.8 ft (0.85 m)
Weight:	485 lbs (220 kg)
Filling:	247 bomblets



Drawing: via ORDATA Online Website

Bomb MK 118 MOD 0

Data for MK 118 MOD 0:

Length: 34.3 cm (13.5 in)
Diameter: Body: 53 mm (2.1 in)
Fin assembly: 57 mm (2.25 in)
Weight: 590 g (1.3 lb)
Explosive: 170 g (0.37 lb) Oct

Reference: www.fas.org

Ordnance Technical Data Sheet
U.S. BOMB, 25-LB, PRACTICE, MK-76

Nomenclature:	U.S. Bomb, 25-lb, Practice, MK-76
Ordnance Family:	Bomb
DODIC:	E9AF, E9AE
Filler:	Signal Cartridge, typically MK-4 MOD 3 (red phosphorus), CXU-3A/B or CXU-2/B (titanium tetrachloride)
Filler weight:	Various (.16 lbs to .38 lbs)
Item weight:	25 lbs (11,000 grams)
Diameter:	4.00 in
Length:	Dependent on Mod (22.5 in to 25.07 in)
Fuze:	Impact or impact-inertia fired

Spotting Charge. Photo by J. Pitcher

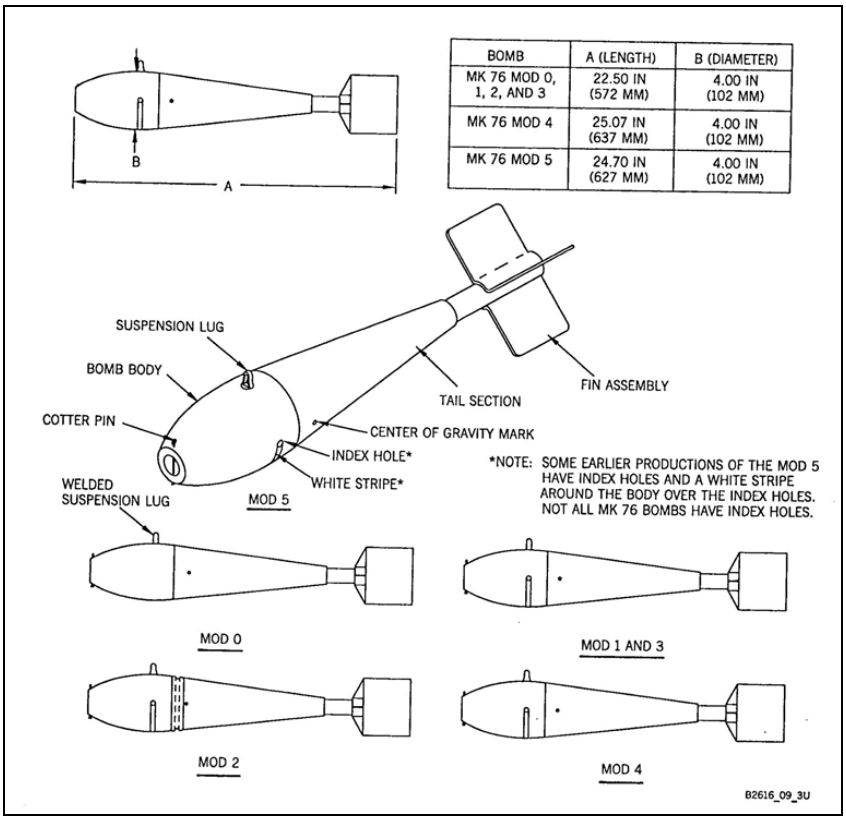
Usage: These are air-dropped, impact or impact-inertia-fired signal-generating practice bombs used to train aircrews in the bombing of surface targets.

Description: The Mk 76-series bombs are painted black or blue. The Mk 76 Mods 1, 2, 3, 4, and some Mod 5 bombs have a 0.25-inch (6-millimeter) white stripe over the index holes. The bombs contain no hazardous components. Hazardous components are contained in the signal cartridge or spotting charge. These bombs are signal-generating, impact-or impact-inertia-fired practice/simulated bombs. These bombs use either the Mk 4-series, Mk 5 Mod 0, CXU-3/B, CXU-3A/B signal cartridge, or the CXU-2/B spotting charge. The Mk 76-series and BDU-33-series bombs are cast iron with sheet steel fin assemblies.

***Titanium tetrachloride** is a colorless to pale yellow liquid that has fumes with a strong odor. If it comes in contact with water, it rapidly forms hydrochloric acid, as well as titanium compounds. Titanium tetrachloride is not found naturally in the environment and is made from minerals that contain titanium. It is used to make titanium metal and other titanium-containing compounds, such as titanium dioxide, which is used as a white

pigment in paints and other products and to produce other chemicals. Military use it as a component of spotting charges. Titanium tetrachloride is very irritating to the eyes, skin, mucous membranes, and the lungs. Breathing in large amounts can cause serious injury to the lungs. Contact with the liquid can burn the eyes and skin.

***Red Phosphorus** may be harmful if absorbed through skin, ingested, or inhaled, and may cause irritation of the skin, eyes, upper respiratory tract, gastrointestinal tract, and mucous membranes. Inhalation of red phosphorus dust may cause bronchitis. Ingestion of red phosphorus may also cause stomach pains, vomiting, and diarrhea. Effects may vary from mild irritation to severe destruction of tissue depending on the intensity and duration of exposure. Prolonged and/or repeated skin contact may result in dermatitis. Chronic exposure may cause kidney and liver damage, anemia, stomach pains, vomiting, diarrhea, blood disorders, and cardiovascular effects. Chronic ingestion or inhalation may induce systemic phosphorus poisoning. If red phosphorus is contaminated with white phosphorus, chronic ingestion may cause necrosis of the jaw bone ("phossy-jaw").



HAZARDS: Explosive; Red phosphorus or Titanium tetrachloride; Smoke/incendiary.

References: ATSDR; The Aviation Ordnanceman; TRI-DDS website; MIDAS; Global Security.org.

Ordnance Technical Data Sheet
U.S. BOMB, 500-LB, PRACTICE, MK-82

Nomenclature:	MK-82, 500-lb, Practice Bomb
Ordnance Family:	Bomb
DODIC:	E9an or F243
Filler:	None (maybe fitted with spotting charge/signals)*
Filler weight:	Not Provided
Item weight:	226.80 kg (500 lbs)
Diameter:	274.00 mm (10.79 in)
Length:	1.67 m (65.90 in)
Fuze:	Impact
Hazards:	Ejection; EMR: Explosive; Frag; Movement; Proximity; Smoke/Incendiary

Usage: The MK-81 through MK-84 concrete or sand-filled practice bombs are used to train pilots in delivery techniques. These bombs normally do not contain an explosive filler or spotting charge. Explosive-loaded practice bombs have been found; therefore, all MK-81 through MK-84 concrete and sand-filled bombs should be treated as suspect. These bombs may contain live internal fuzes with boosters, live external fuzes and adapter-boosters, or a spotting charge adapter with a signal cartridge installed. They are all designed to function on impact, producing blast and fragmentation or a puff of white smoke.

Description: The MK-82 (modified) bomb has a welded nose plate and the BDU-50/B bomb has a threaded nose with a plastic plug installed. The aft end of the MK-82 (modified) bomb is closed with a removable tail plate for filling operations and the BDU-50/B bomb is closed with a base plate, neither of which contain a threaded fuze well. The bomb body, conical fin assembly, and closure plugs are steel.

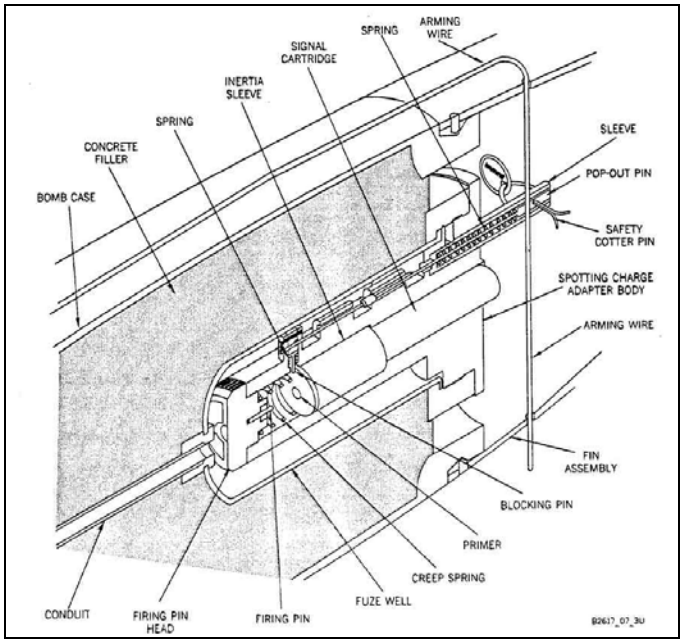
The MK-82 inert bomb is painted olive drab with a 38-millimeter (1.50-inch)-wide yellow band followed by a 51-millimeter (2.00-inch)-wide blue band on the nose. The markings SPOTTING CHARGE INSTALLED, (the date), and 6.25 POUNDS COMPOSITION C4, are stenciled in white on each side of the bomb next to the suspension lugs.

***Titanium tetrachloride** is a colorless to pale yellow liquid that has fumes with a strong odor. If it comes in contact with water, it rapidly forms hydrochloric acid, as well as titanium

compounds. Titanium tetrachloride is not found naturally in the environment and is made from minerals that contain titanium. It is used to make titanium metal and other titanium-containing compounds, such as titanium dioxide, which is used as a white pigment in paints and other products and to produce other chemicals. Military use it as a component of spotting charges. Titanium tetrachloride is very irritating to the eyes, skin, mucous membranes, and the lungs. Breathing in large amounts can cause serious injury to the lungs. Contact with the liquid can burn the eyes and skin.

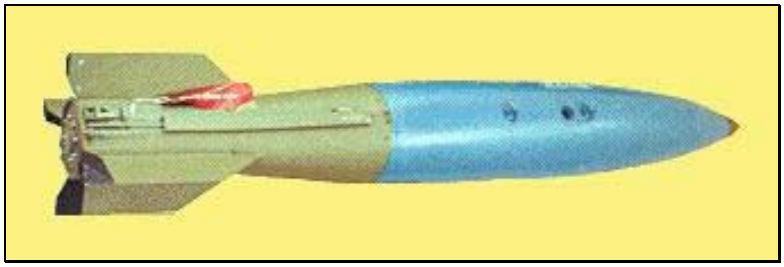
****Pyrotechnic** and screening devices contain combustible chemicals which, when ignited, rapidly generate a flame of intense heat, flash, infrared radiation, smoke or sound display (or combinations of these effects) for a variety of purposes. Compared to other explosive substances, pyrotechnics are more adversely affected by moisture, temperature, and rough handling. Some compositions may become more sensitive, and even ignite, when exposed to moisture or air. Mixtures which contain chlorates and sulfur are susceptible to spontaneous combustion. Most pyrotechnics produce a very hot fire that is difficult to extinguish and most burn without serious explosions. Many chemicals used in pyrotechnics produce toxic effects when ignited. Other pyrotechnics, which contain propelling charges, create an extremely hazardous missile hazard if accidentally ignited.

*** **Composition C-4**: This is a (91/9) RDX and plastic explosive composition. It is semi-plastic putty-like material, dirty white to light brown in color, less sensitive, more stable, less volatile and more brisant than composition C-3. It is a non-hydroscopic material that has found application in demolition blocks and specialized uses.



Reference: ORDATA Online, MIDIAS.

Ordnance Technical Data Sheet
U.S. BOMB, 1,000-LB, PRACTICE, MK-83



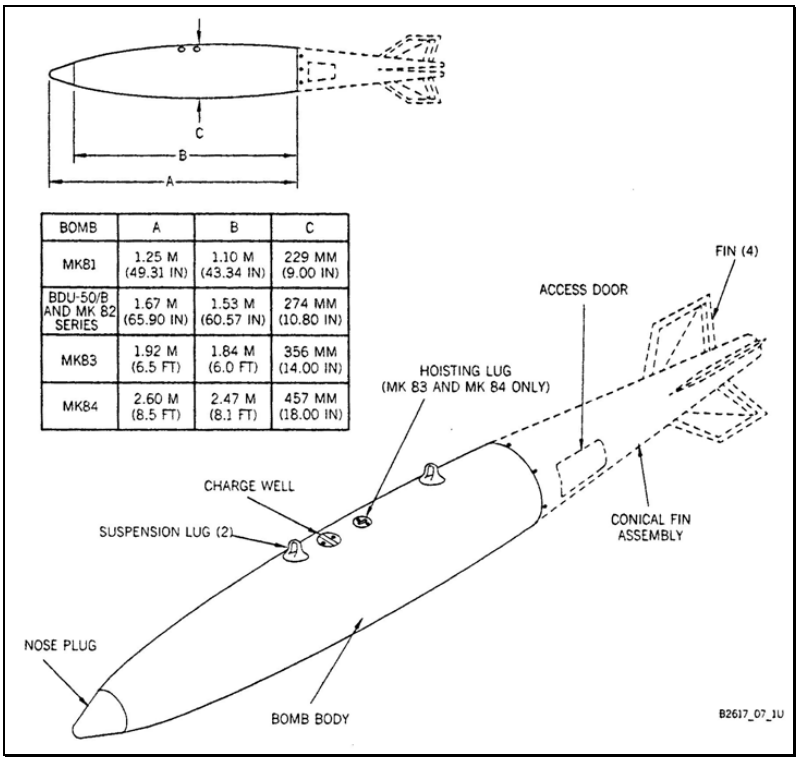
Nomenclature:	U.S. BOMB, 1,000-LB, PRACTICE, MK-83
Ordnance Family:	Bombs
DODIC:	E511
Explosive:	None
Item weight:	1,054 lbs
Diameter:	14 in (356 mm)
Length:	6.5 ft (1.92 m) nose to end of bomb body (does not include fin)
Frag Range:	20 m
Hazard:	Ejection; EMR; Frag; Explosive (HE); Movement; Proximity (VT); Smoke/Incendiary
Explosive Weight:	0 gm
Component Materials:	The bomb body, conical fin assembly, and closure plugs are steel.

Usage: The MK-81 through MK-84 concrete or sand-filled practice bombs are used to train pilots in delivery techniques. These bombs normally do not contain an explosive filler or spotting charge. Explosive-loaded practice bombs have been found; therefore, all MK-81 through MK-84 concrete and sand-filled bombs should be treated as suspect. These bombs may contain live internal fuzes with boosters, live external fuzes and adapter-boosters, or a spotting charge adapter with a signal cartridge installed. They are all designed to function on impact, producing blast and fragmentation or a puff of white smoke.

Description: The tail fuze cavity will be closed with a closure plug, spotting charge adapter, fuze, or conical plug. The nose fuze cavity will be closed with a fuze or nose plug. The nose plug will be either conical with two wrench flats, or streamlined with a spanner hole. Depending on the fuzing, the bombs may have an arming wire assembly, a lanyard, a cable, or an electrical charging receptacle installed. The charging well between the suspension lugs may be closed by a plug or may be fitted with an electrical charging receptacle, a lanyard lock, a fuze initiator, or an arming safety switch. The suspension lugs are 356 millimeters (14.00 inches) apart, except on the MK-84 they are 762 millimeters (30.00 inches) apart. The bombs may be fitted with conical or retarding fin assemblies. The bombs can be internally or externally fuzed. The arming assembly for a

mechanical tail fuze may extend through the base or the side of the conical fin assembly, depending on the arming assembly used. An empty fuze cavity may be closed by a closure plug; however, the presence of a closure plug in a fuze cavity does not indicate the absence of a fuze. Bombs with certain fuzes have a closure plug screwed into the fuze cavity, making direct identification of the fuze impossible. When the fuze is not exposed, identification may be aided by observation of certain fuze-related features such as the type of closure plug in the fuze cavities and the components installed in the charging well. Other features such as the presence of arming vanes and reach rods may also aid in determining the type of fuze used.

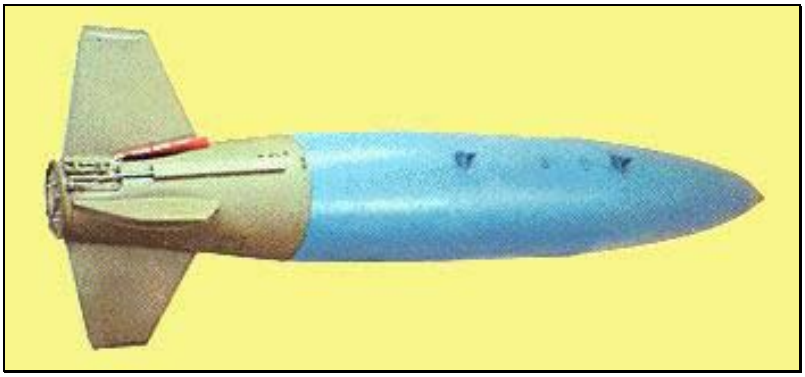
The MK-81 through MK-84 concrete- or sand-filled bombs are painted blue or olive drab, with white or black markings. Bombs fitted with a signal charge will have a brown or yellow band no wider than 76 millimeters (3.00 inches) circumscribed near the nose of the bomb. However, explosive-loaded practice bombs may be found without markings or color band indicating the explosive content. Inert-loaded MK-82 Mod 2 practice bombs may be found with an olive drab thermal coating and a 76-millimeter (3.00-inch)-wide blue nose band. Loading information is stenciled on the thermal coating. Thermally protected practice bombs are also die-stamped on the base plate to indicate their inert filler.



BOMB	A	B	C
MKB1	1.25 M (49.31 IN)	1.10 M (43.34 IN)	229 MM (9.00 IN)
BDU-50/B AND MK 82 SERIES	1.67 M (65.90 IN)	1.53 M (60.57 IN)	274 MM (10.80 IN)
MKB3	1.92 M (6.5 FT)	1.84 M (6.0 FT)	356 MM (14.00 IN)
MKB4	2.60 M (8.5 FT)	2.47 M (8.1 FT)	457 MM (18.00 IN)

References: ORDATA Online; MIDAS.

Ordnance Technical Data Sheet
U.S. BOMB, 2,000-LB, PRACTICE, MK 84

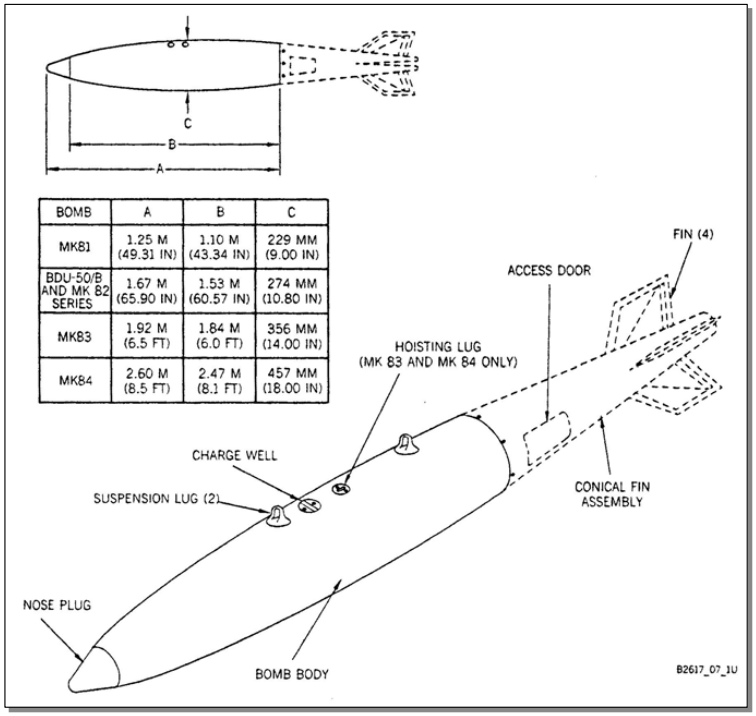


Nomenclature: U.S. BOMB, 2,000-LB, PRACTICE, MK 84
Ordnance Family: Bombs
DODIC: E9bd
Filler: Signal cartridge MK-4 Mod 3 (red phosphorus)
Item weight: 2,039 lbs
Diameter: 18 in (457 mm)
Length: 8.5 feet (2.6 m) without fin
Frag Range: 20 m
Hazard: Ejection; EMR; Frag; Explosive (HE); Movement; Proximity (VT); Smoke/Incendiary

Usage: The MKs 81 through 84 concrete or sand-filled practice bombs are used to train pilots in delivery techniques. These bombs normally do not contain an explosive filler or spotting charge. Explosive-loaded practice bombs have been found; therefore, all MK-81 through MK-84 concrete and sand-filled bombs should be treated as suspect. These bombs may contain live internal fuzes with boosters, live external fuzes and adapter-boosters, or a spotting charge adapter with a signal cartridge installed. They are all designed to function on impact, producing blast and fragmentation or a puff of white smoke.

Description: MK-81 through MK-84 and MK-82 inert bombs. The tail fuze cavity will be closed with a closure plug, spotting charge adapter, fuze, or conical plug. The nose fuze cavity will be closed with a fuze or nose plug. The nose plug will be either conical with two wrench flats, or streamlined with a spanner hole. Depending on the fuzing, the bombs may have an arming wire assembly, a lanyard, a cable, or an electrical charging receptacle installed. The charging well between the suspension lugs may be closed by a plug or may be fitted with an electrical charging receptacle, a lanyard lock, a fuze initiator, or an arming safety switch. The suspension lugs are 356 millimeters (14.00 inches) apart, except on the MK-84 they are 762 millimeters (30.00 inches) apart. The

bombs may be fitted with conical or retarding fin assemblies. The bombs can be internally or externally fuzed. The arming assembly for a mechanical tail fuze may extend through the base or the side of the conical fin assembly, depending on the arming assembly used. An empty fuze cavity may be closed by a closure plug; however, the presence of a closure plug in a fuze cavity does not indicate the absence of a fuze. Bombs with certain fuzes have a closure plug screwed into the fuze cavity, making direct identification of the fuze impossible. When the fuze is not exposed, identification may be aided by observation of certain fuze-related features such as the type of closure plug in the fuze cavities and the components installed in the charging well. Other features such as the presence of arming vanes and reach rods may also aid in determining the type of fuze used.



The MK-81 through MK-84 concrete- or sand-filled bombs are painted blue or olive drab, with white or black markings. Bombs fitted with a signal charge will have a brown or yellow band no wider than 76 millimeters (3.00 inches) circumscribed near the nose of the bomb. However, explosive-loaded practice bombs may be found without markings or color band indicating the explosive content. Inert-loaded MK-82 Mod 2 practice bombs may be found with an olive drab thermal coating and a 76-millimeter (3.00-inch)-wide blue nose band. Loading information is stenciled on the thermal coating. Thermally protected practice bombs are also die-stamped on the base plate to indicate their inert filler.

References: ORDATA Online; MIDAS.

BOEING

Backgrounder

Integrated Defense Systems
P.O. Box 516
St. Louis, MO 63166
www.boeing.com

Joint Direct Attack Munition

Description & Purpose:
The Joint Direct Attack Munition (JDAM) is a low-cost guidance kit produced by Boeing that converts existing unguided free-fall bombs into accurately guided "smart" weapons. The JDAM kit consists of a tail section that contains a Global Positioning System/Inertial Navigation System and body strakes for additional stability and lift.

Additional growth to the JDAM low-cost family of weapons includes Laser JDAM, the incorporation of a laser sensor that improves JDAM's current near-precision accuracy to precision accuracy and facilitates prosecution of targets of opportunity (including moving targets); JDAM Extended Range (JDAM ER), the incorporation of a low-cost wing set to extend JDAM's standoff range to greater than 40 miles, and the incorporation of JDAM guidance on other warheads such as naval mines, heavy penetrator warheads and new specialty warheads.

Customer(s):
Both the U.S. Air Force and U.S. Navy employ JDAM. Its first operational use was during Operation Allied Force in the Balkans in 1999. JDAM has been used extensively in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom. The first international sale was made to Israel in 2000. Since then, 18 additional international customers have purchased JDAM.

General Characteristics:
Currently, MK-84 2,000-pound and BLU-109 2,000-pound (900-kg) bombs (GBU-31); MK-83 (GBU-32); and MK-82 500-pound (225-kg) bombs (GBU-38) are in production to make the cost-effective JDAM. When employed, these weapons have proven highly accurate and can be delivered in any flyable weather. JDAM can be launched from more than 15 miles from the target with updates from GPS satellites to help guide the weapon to the target.

The JDAM production team includes Honeywell Inc. (inertial measurement unit); Rockwell Collins (global positioning system receiver); HR Textron (tail actuator subsystem); Lockheed Martin Tactical Defense Systems (mission computer); Lockely (tail fairing); Enser and Eagle-Picher (battery); and Stremel (strakes and cable cover).

Background:
The full-scale production decision (milestone III) for JDAM was made by the U.S. Department of Defense (DoD) in March 2001. In November 2004, Boeing delivered the 100,000th JDAM to the U.S. military. As of June 2008, Boeing has delivered more than 195,000 JDAM tail kits and still produces over 1,200 JDAMs every month. The DoD now plans to procure about 217,000 JDAM kits in several configurations to fit the various warheads.

Contact: Tim Deaton
Global Strike Systems
The Boeing Company
(314) 232-5886
timothy.r.deaton@boeing.com

August 2008

Raytheon

JSOW
Family of Precision Strike Weapons

The Joint Standoff Weapon is a modular, affordable, highly-lethal weapon revolutionizing strike warfare.

Benefits

- Increased weapon and platform survivability
- Multiple launch capability
- Tactical flexibility
- Jointness and interoperability
- Cost effective

Joint Standoff Weapon (JSOW)
This new generation glide weapon ensures warfighter survivability by enabling precision air strike launches from well-beyond most enemy air defenses, at kinematic standoff ranges up to 70 nm (130 km). JSOW Block II development significantly reduced JSOW unit costs and added Selective Availability/ Anti-Spoofing Module (SAASM) Global Positioning System (GPS) capability. It was completed in 2006.

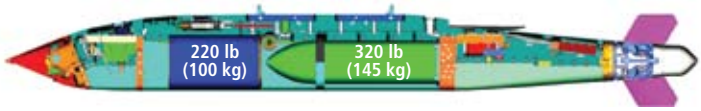
The family of JSOW precision strike weapons is modular in design with variants that can integrate different lethal submunitions, and a blast/ fragmentation unitary warhead and a hardened target penetrator that can be programmed for blast and fragmentation effects. JSOW targets vary from all types of area targets to hard point targets. JSOW's low radar cross section and infrared signature are key stealth features and ensure a high probability of survival en route to heavily defended targets.

The blast/fragmentation unitary variant incorporates the insensitive 500-pound BLU-111 (MK-82). The BROACH penetrator/blast/fragmentation variant incorporates an uncooled Imaging Infrared (IIR) autonomous terminal seeker and tracker, and integrates the BROACH dual-stage blast/ fragmentation and/or penetrator warhead. This variant enables precision attack of point targets.

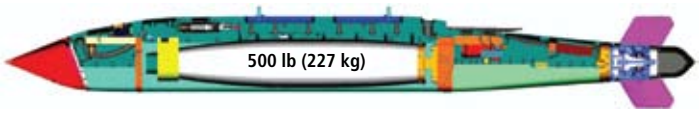
Since 1999, JSOW has been combat proven in operations Southern Watch, NATO Allied Force, Enduring Freedom and Iraqi Freedom with more than 400 weapons employed. More than 3,400 JSOWs have been produced.

Operations
Today, JSOW variants can engage and destroy virtually the entire target set for U.S. forces spanning a range of threat environments. All JSOW variants are guided to the target area by a highly-integrated GPS and Inertial Measurement System. JSOW receives the targeting information in preplanned mode, in the cockpit with data received while airborne through onboard sensors, or through other third-party targeting assets. After the AGM-154C BROACH variant arrives in the target area, it utilizes the IIR seeker for autonomous guidance in the terminal phase of the flight to attack with precision accuracy.

Modularity/Growth
JSOW is designed to take advantage of new developments in payloads and sensors through design modularity of the air vehicle. The payload bay can accommodate lethal and nonlethal payloads — from warheads to pamphlets to sensor packages. The terminal seeker space can accept the latest sensors as they are developed.



JSOW-C with the BROACH Warhead



JSOW-A-1 with the BLU-111 Warhead

A technology demonstration phase is currently underway leading to a spring 2009 JSOW Extended Range (ER) Free Flight Test.

Performance

JSOW demonstrated all standoff accuracy and lethality requirements in a highly-successful development and operational test program. This demonstrated the ability to launch from high or low altitudes and accurately navigate to the target area via selected waypoints, further enhancing weapon and aircrew survivability.

JSOW A-1 (BLU-111) is currently in production for FMS only. JSOW C is currently in production for four international FMS customers.

The AGM-154C (BROACH) has demonstrated precision accuracy within approximately four feet in developmental and operational tests. The weapon is in full-rate production and achieved initial operating capability in February 2005.

JSOW C-1 adds a two-way datalink and moving maritime target capability, is in full-scale development and scheduled for initial operation capability in FY 2010.

JSOW is integrated on the F-15E, F-16, F/A-18, B-2 and B-52 aircraft. JSOW is also a threshold internal bay weapon for the F-35 Joint Strike Fighter initial operational capability. The aircraft compatibility built into the JSOW design will minimize integration costs for future aircraft platforms. The maturity and proven capabilities within the JSOW make this a user-friendly, highly-reliable, cost-effective system.

JSOW Specifications

Length:	160 in	(4.1 m)
Weight:	~1,050 lb	(475 kg)

Aircraft Compatibility:

- F-16, F-15E, F/A-18, B-2, B-52, P-3, F-35 (JSF), JAS 39 Gripen, Eurofighter 2000, Tornado
- Multiple carriage capable on BRU-55/BRU-57 twin launchers
- MIL-STD-1553/1760 and NATO STANAG 3837 AA interface for full capability

Range (unpowered):

- Low altitude 500-ft launch 12 nm (22 km)
- High altitude 40,000-ft launch 70 nm (130 km) maximum kinematic range

JSOW-ER (powered): – In technology demonstration phase

- ~155 nm (290 km) — Spiral 0

Warheads:

- 500-lb BROACH — Blast/fragmentation and/or penetrating warhead Demonstrated 5 ft (1.5 m) concrete penetration
- 500-lb BLU-111 — Unitary blast/fragmentation warhead

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Raytheon

Customer Success Is Our Mission

APPENDIX F
PUBLIC INVOLVEMENT

F1: CORRESPONDENCE FROM GOVERNMENTAL AGENCIES, ORGANIZATIONS, AND PRIVATE ENTITIES AND INDIVIDUALS

During the public review process for the DEIS/OEIS, 119 comments were received; 30 from federal agencies, 66 from state agencies, 9 from non-governmental organizations, and 14 from individuals or private entities. This section contains a list of the agencies and private entities that elected to comment on the DEIS/OEIS, scanned copies of each letter with comment numbers assigned by the Navy in yellow, and a comment matrix with Navy responses associated with each comment.

F2: PUBLIC HEARINGS

Four public hearings were held 14-17 July 2008 to receive public comments on the VACAPES Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS/OEIS). The hearings were held in Ocean City, MD, Chincoteague and Virginia Beach, VA, and Kitty Hawk, NC. Sign-in sheets and speaker request forms are contained in this section.

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Correspondence from Government Agencies, Organizations, and Private Entities and Individuals on VACAPES Draft EIS/OEIS

Comment Tracking Code	Date	Affiliation	Author
Federal Agencies			
F1	Aug 11, 2008	US Department of the Interior, Minerals Management Service	Chris C. Oynes
F2	Aug 11, 2008	US Environmental Protection Agency	William Arguto
State Agencies			
S1	Jul 12, 2008	Delaware Department of Natural Resources- Division of Soil and Water Conservation	Sarah Cooksey
S2	Jul 18, 2008	Virginia Department of Environmental Quality- Air Division	Kotur Narasimhan
S3	Jul 21, 2008	Virginia Department of Historic Resources	Marc Holma
S4	Jul 23, 2008	Virginia Department of Conservation and Recreation	Robert Munson
S5	Jul 24, 2008	Virginia Department of Mines, Minerals and Energy	Edward Erb
S6	Aug 5, 2008	Maryland Environmental Science	Charles Madison
S7	Aug 7, 2008	Virginia Department of Game and Inland Fisheries	Amy Ewing
S8	Aug 11, 2008	Virginia Department of Environmental Quality	Ellie Irons
S9	Aug 8, 2008	North Carolina Department of Administration	Valerie W. McMillan
Organizations			
O1	Jul 25, 2008	Virginia Institute of Marine Science	Pam Mason
O2	Aug 11, 2008	Association of Maryland Pilots	Captain John Hamill
O3	Jul 14, 2008	Merchant Marines	Eric Clark
O4	Jul 16, 2008	VA Aquarium and Marine Science Center	Susan Barco
Private Entities/Individuals			
P1	Jul 14, 2008	Charter fishing captain	Ron Gladkowski
P2	Aug 4, 2008	Private	Sharon Stewart
P3	Aug 8, 2008	Private	Joan Kean
P4	Aug 11, 2008	Private	Claudia Alesi
P5	Jul 16, 2008	Private	Lauren Heesemann
P6	Jun 27, 2008	Private	Jean Public (anonymous)

P7	Jul 14, 2008	Private	Tom McClure
P8	Jul 14, 2008	Private	John B. Stewart
P9	Jul 16, 2008	Private	Ellis W. James
P10	Jul 16, 2008	Private	Debora Mosher

COMMENT LETTERS
VACAPES Draft EIS/OEIS
Comment Period _28 June 08____ through _11 August 08__

Comment #F1

United States Department of the Interior

MINERALS MANAGEMENT SERVICE
Washington, DC 20240

AUG 11 2008

Captain J. M. Hinson
Naval Facilities Engineering Command
Atlantic, Code EV22ES
6506 Hampton Boulevard
Norfolk, Virginia 23508-1278

Dear Captain Hinson:

Thank you for giving the Minerals Management Service (MMS) the opportunity to submit comments for consideration for the Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) on the U.S. Department of the Navy (Navy) Virginia Capes Range Complex (VACAPES).

The MMS recognizes the Navy's concern regarding potential conflicts with military operations in several potential areas of leasing consideration in the proposed final program of the 5-Year Outer Continental Shelf (OCS) Oil and Gas Leasing Program for 2007-2012, particularly the newly proposed area off the coast of Virginia, as well as proposed areas recognized in alternative energy interim policy in Federal waters offshore Delaware, Maryland and Virginia. Recent events regarding the current energy situation could potentially result in multiple-use conflicts. The MMS has consulted regularly and successfully with officials of the DoD on many multiple-use issues in the past, and we anticipate resolution of any potential and forthcoming conflicts with military operations via the existing Memorandum of Agreement (MOA), or a revised MOA that is currently being finalized.

On August 1, 2008, the MMS published a Request for Interest (RFI) for preparation of a 5-year OCS Oil and Gas Leasing Program. This out-of-cycle program is being developed to more accurately reflect the current energy situation and in response to the President's lifting of the Withdrawal. The announcement is the first step in a two-year process to develop a new leasing program. This Notice in particular requests comments on areas that are restricted from leasing by Congressional Moratoria but were removed from Presidential Withdrawal on July 14, 2008.

Section 18 of the OCS Lands Act (43 U.S.C. 1344) requires the Department of the Interior to solicit information from interested and affected parties during the preparation of a 5-year OCS oil and gas leasing program. The current 5-year program covers the period July 2007 to June 30, 2012. The MMS is soliciting information on whether to begin a new program for mid-2010 to mid-2015 (approximate dates) to succeed the current one. Section 18 requires completion of a multi-step process of public consultation and analysis before the Secretary of the Interior may approve a new 5-year program. The areas that may ultimately be included, if a new program is developed, may includes areas beyond the current area offshore Virginia. We anticipate continued success in coordinating with Navy as has been done during preparation of previous 5-year program regarding potential multiple-use issues in these areas via the MOA.

F1-1 Specific to your request for comments, the MMS offers the following comments regarding the subject DEIS/OEIS, Section 6.2.3.2 - Programmatic Environmental Impact Statement for Alternative Energy Development and Production and Alternative Use of Facilities on the OCS:

- On November 6, 2007, the MMS announced in the Federal Register an interim policy for authorization of the installation of offshore data collection and technology testing facilities in Federal waters. The MMS accepted comments and nominations until January 7, 2008 regarding the authorization of OCS activities involving the installation of meteorological or marine data collection facilities to assess alternative energy resources (e.g., wind, wave, and ocean current) or to test alternative energy technology. The interim policy is in effect until the MMS promulgates final rules.

  The MMS received over 40 nominations in response to the November 6, 2007 notice offshore both the East and West coasts. In April, the MMS identified a subset of 16 proposed lease areas out of the over 40 received in total for priority consideration and provided public notice of those areas. The public notice was issued for the purpose of determining competitive interest as required by the Energy Policy Act of 2005 (EPAct) and for receiving relevant environmental or other information. The comment period on the April notice closed on June 30, 2008. Descriptions of the 16 projects are provided on the web site at the following link:

  http://www.mms.gov/offshore/AlternativeEnergy/InitialInterimPolicyProposedProject.htm

  Although MMS is proceeding with a subset of the total proposed nominations, any project that is not addressed during this initial phase remains a viable candidate for possible future consideration. This means that any of the over 40 proposed projects could proceed in the future, either in subsequent phases under the Interim Policy, or as full commercial leases after the regulations become final at the end of 2008.

  The table below summarizes all of the sites where projects were proposed offshore the East Coast in the states adjoining the region affected by the VACAPES Range Complex.

Company Name	State Offshore	Protraction Diagram	OCS Block(s)	Distance Offshore	Resource	Proposed Activity
Blue Water Wind	Maryland	Confidential	Confidential	13 miles	Wind	Met tower
Blue Water Wind	Delaware	Salisbury NJ 18–05	6325	16 miles	Wind	Met tower
Santee Cooper	South Carolina	Confidential	Confidential	4 miles	Wind	Met tower
Santee Cooper	South Carolina	Confidential	Confidential	4 miles	Wind	Met tower
Commonwealth of Virginia	Virginia	Currituck Sound NJ 18-11	6107, 6108, 6157, and 6158	12 – 18 miles	Wind	Met tower

The proposed nominations offshore Delaware are proceeding under the Interim Policy as explained at the URL listed earlier in these comments.

Exhibit A indicates ocean activities on the OCS south of the Mouth of the Chesapeake Bay. Superimposed on this map are fifty lease blocks (each 4.8 km by 4.8 km) from the MMS Official Protraction Diagram for NJ18-11 "Currituck Sound" and indicate the ocean space of interest. The four brown-shaded blocks just south of the Chesapeake Light tower (CHLV2) indicate the area that Virginia is interested in nominating for alternative energy technology testing.

In regard to Section 6.4.4.2 - VACAPES EIS/OEIS Incremental Contribution and Cumulative Impacts from Other Projects and Activities (Past, Present, and Reasonably Foreseeable Future):

F1-2

- The area under consideration has been heavily used for beach nourishment by both the City of Virginia Beach, as well as the Navy. Virginia Beach has used 5.1 million cubic yards of sand from Sand bridge Shoal, a large sand accumulation that lies 3 to 5 miles offshore of the beach community of Sand bridge, for 3 beach nourishment projects (1998, 2002, and 2007) and is planning to use it for future nourishments of the resort strip beaches. The sand in this shoal is of very good quality for beach construction, and the MMS has spent over several million dollars on resource evaluation and environmental impact studies on the feature. The Navy has used over 1.5 million cubic yards from the same shoal for two projects (1996 and 2003) to nourish the shore of its Dam Neck Training Facility. Considerable sand resources suitable for future beach construction remain in the shoal, and it is important that these resources remain accessible for both the City of Virginia Beach and the Navy. Several other sand accumulations are known in the area under consideration, including shoals off Cape Henry and off False Cape. These will be used in the future when the sand in Sand bridge Shoal is depleted or the integrity of the shoal is threatened.

F1-3

- The expanded VACAPES areas (Maryland and Delaware to the north, and as far south as Cape Hatteras, North Carolina) also include sand resource sites that have either been used for beach nourishment projects or are planned for upcoming projects. These are mostly sand ridges and shoals that occur between 3 and 8 nautical miles from shore which were identified by cooperative studies with MMS and the state governments. A large number of shoals have been identified offshore Maryland that are suitable for beach nourishment including Great Gull Bank, which has provided about 2 million cubic yards of sand for northern Assateague Island National Seashore, along with several other shoals that are slated for use at Ocean City's beaches. Additional sand sites have been studied offshore Delaware including Hen and Chickens Shoal and a few sites at the mouth of Delaware Bay that are of interest for future Delaware and Cape May, New Jersey beach projects. Lastly, the area offshore Dare County, North Carolina out to 8 nautical miles contains several sand resource sites that are slated for use in nourishing beaches from Kitty Hawk to Avon.

- The Secretary of the Interior has included in the adopted 2007-2012 program an OCS lease area offshore Virginia. Please note that (1) it includes a 50-mile buffer zone off Virginia's coast and (2) no new leasing in the Atlantic OCS will occur unless the Congress discontinues the moratorium that is in effect for oil and gas activities on the Atlantic OCS until year 2012.

- Additionally, the Governor of the Commonwealth of Virginia requested "Interior's consideration in keeping Virginia in the 5-year plan in a way that comports with Virginia's offshore energy policies as enacted in state law.

The MMS remains committed to working with Navy to reconcile any potential conflicts with military operations should there be any oil and/or gas activities, alternative energy activities as sand and gravel lease requests are proposed for this area. Both Departments acknowledge the fine working relationship that exists between them and pledge to foster the continuation of this cooperative relationship. Continued consultation with the Navy in a collaborative manner at both the planning and operational stages will ensure that each agency achieves its mission.

We look forward to continuing to work with the Navy on the VACAPES study area under our existing memorandum of agreement (MOA), or a revised MOA.

Sincerely,

E P Danenberger

for Chris C. Oynes
Associate Director for
Offshore Energy and Minerals Management

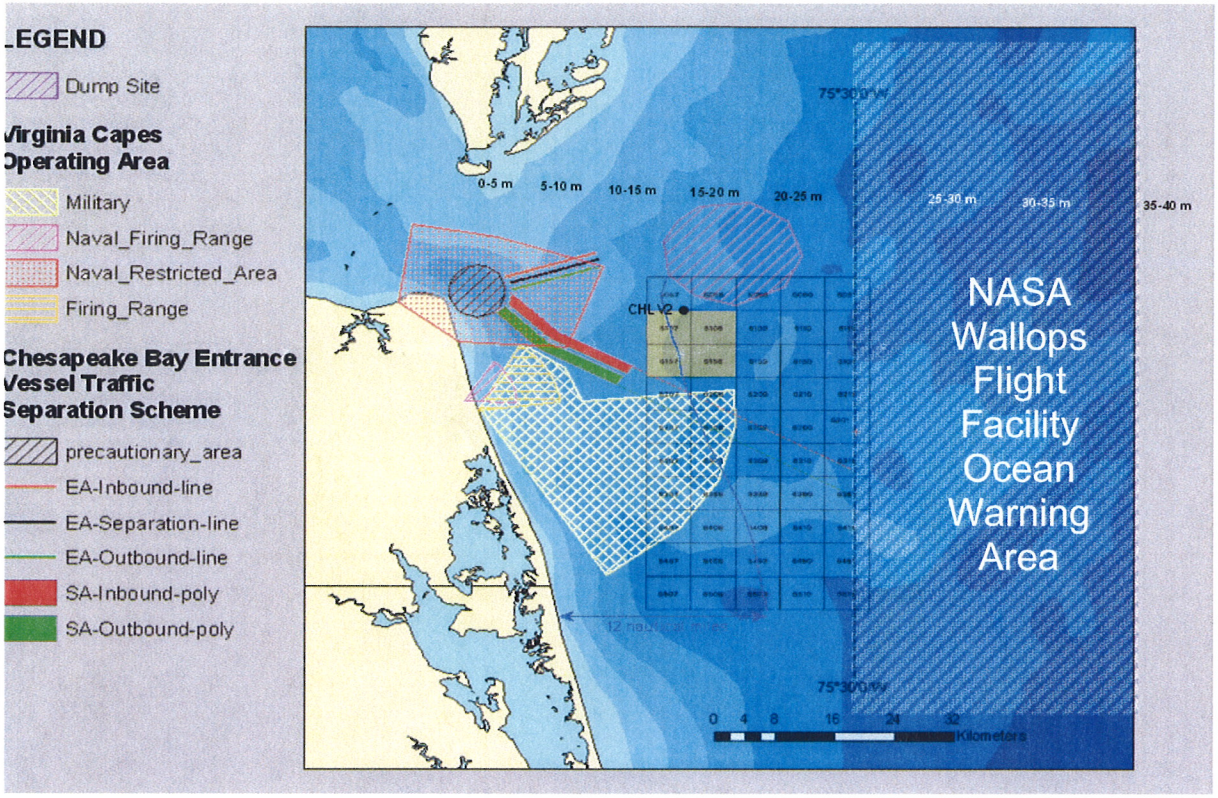

Exhibit A: Source: Virginia Coastal Energy Research Consortium. The map identifies ocean activities on the OCS south of the Mouth of the Chesapeake Bay. Fifty lease blocks (each 4.8 km by 4.8 km) from the MMS Official Protraction Diagram for NJ18-11 "Currituck Sound" are superimposed on this map and indicate the ocean space of interest. The four brown-shaded blocks just south of the Chesapeake Light tower (CHLV2) indicate the area that Virginia is interested in nominating for alternative energy technology testing.

Comment #F2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Ms. Erin Swiader
VACAPES EIS/OEIS PM
Code EV22ES
6506 Hampton BLVD
Norfolk, VA 23508-1278

August 11, 2008

Re: Virginia Capes Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement June 2008 CEQ #20080241

Dear Ms. Swaider:

In accordance with the National Environmental Policy Act (NEPA) of 1969 and Section 309 of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) offers the following comments regarding the Virginia Capes (VACAPES) Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS). Based on our review, EPA has rated the environmental impacts of the DEIS as "EC" (Environmental Concerns) and the adequacy of the impact statement as "2" (Insufficient Information). A copy of EPA's ranking system is enclosed for your reference. The basis for this rating is contained in the remainder of this letter.

Project Description

The Department of the Navy (Navy) has prepared this DEIS to assess the potential environmental impacts over a 10-year planning horizon associated with the Navy Atlantic Fleet training; research, development, testing, and evaluation (RDT&E) activities; and associated range capability enhancements (including infrastructure improvements) in the VACAPES Range Complex. The Study Area includes the airspace, seaspace and undersea space from the mean high tide line seaward to the 3-nautical-mile boundary of the states of Delaware, Maryland, Virginia, North Carolina, and the lower Chesapeake Bay, where proposed Mine Warfare (MIW) training would occur.

Project Purpose and Need

The purpose of the proposed action is to:

- Achieve and maintain Fleet readiness using the VACAPES Range Complex to support and conduct current, emerging, and future training operations and RDT&E operations;
- Expand warfare missions supported by the VACAPES Range Complex; and
- Upgrade and modernize existing range capabilities to enhance and sustain Navy training RDT&E.

The need for the proposed action is to provide range capabilities for training and equipping combat-capable naval forces ready to deploy worldwide.

Alternatives

The DEIS evaluates three alternatives; they are:

1. The **No Action Alternative** that continues current operations.

2. **Alternative 1** would include all of the features of the no action and would implement enhancements to the minimal extent possible to meet the components of the Fleet Readiness Training Plan (FRTP) to implement the Fleet Response Plan (FRP). Alternative 1 would increase operational training, expand warfare missions, and accommodate force structure changes, which would include changing weapon systems and platforms, and homebasing new aircraft and ships.

3. **Alternative 2 (Preferred Alternative)** would include all of the enhancements of Alternative 1, plus it would include additional mine warfare training capabilities, the establishment of MIW training areas with small fields of mine shapes, and the implementation of additional enhancements to enable the range complex to meet future requirements. The Navy would also reduce the number of training events that involve dropping live, high explosive ordnance on targets at sea by 96% from the No Action Alternative.

As previously stated, the proposed action is to support and conduct current and emerging training and RDT&E operations in the VACAPES Range Complex. The decision by the Navy is to determine both the level and mix of training to be conducted and the range capabilities enhancements to be made within the VACAPES Range Complex that best meet the needs of the Navy. EPA understands the needs of the Navy, but has concerns with environmental impacts from the proposed action and requests more information specific to the lower Chesapeake Bay, hazardous materials, water quality, marine mammals/threatened and endangered species, historic preservation and cumulative impacts.

Thank you for the opportunity to offer these comments. If you have any questions, please contact Karen DelGrosso at (215)814-2765 or Barbara Okorn at (215)814-3330.

Sincerely,

William Arguto
Office of Environmental Programs
NEPA Team Leader

Specific Comments

Alternatives

F2-1

- Based on the information provided on page 2-19, it is not clear what happens to the mine shapes in AMNS, RAMICS. The description says that they are expendable, inert, bottom and moored mine shapes. Does this mean they will stay in place permanently? Will the AMMNS explosive charge always be replaced with a ballast device? More details should be provided in the text of the FEIS.

F2-2

- Based on the information provided on page 2-20, it is not clear if there is an impact to environmental receptors from OASIS and AN/AQS-20 acoustics and sonar.

F2-3

- Page 2-24, Instrumented Training Area (South) – states that "Because both systems operate on or just below the surface, their training areas can be in shallow water. Both these factors dictate the need for a mine training area in the lower Chesapeake Bay,…." It is unclear why this activity must take place in the Bay. The rationale for using this valuable resource should be described further.

Lower Chesapeake Bay

F2-4

- The Preferred Alternative, Alternative 2, proposes additional mine warfare training areas to be established in the lower Chesapeake Bay. Non-explosive mine shapes would be deployed in these areas to simulate a threat minefield. Table 2.2-4, Current and Proposed Operations in the VACAPES Study Area, lists the Mine Warfare (MIW) operations, but does not clearly distinguish the activity associated with the additional mine warfare training areas to be established in the lower Chesapeake Bay. This should be clarified.

F2-5

- Table 2.2-1, labeled "VACAPES Study Area Typical Operations Included in this EIS/OEIS [a/6]," notes under MIW, Mine countermeasures exercise, the description of operation and the training area location. Since the training area noted is in the lower Chesapeake Bay, it is assumed that the proposed additional mine warfare training area in the lower Chesapeake Bay is represented here. Thus, the exercises would train forces to detect, identify, classify, mark, avoid, and disable (or verify destruction of) sea mines using a variety of methods, including air, surface, and subsurface assets. However, the level and specific kind of activity associated with the proposed mine areas should be discussed. The specific training activity connected with the minefields should be clearly explained to have an understanding of the operation of the minefield. This information would help to better assess the environmental impacts associated with the minefield, training activities and its impact to the lower Chesapeake Bay. In addition, [(6)] in the title of Table 2.2-1 is not defined in the key, only [(a)] is mentioned.

F2-6

F2-7

- Page 3-11 states that "Alternative 2 would increase the number of explosions used for mine countermeasure and mine neutralization training about eight-fold compared to the No Action Alternative." The location of these explosions should be identified and indicated on a map. The impact of these explosions should be discussed in the FEIS.

F2-8

- Page 3-12 states, "Based on the studies at the CFMETR, the volume of military expended materials that would result from Alternative 2 would not measurably affect sediment quality." The acronym, CFMETR, is not included on the List of Acronyms and Abbreviations. The FEIS should identify CFMETR and elaborate to determine credibility of the studies performed and cited.

F2-9

- The habitat and importance of the Chesapeake Bay should be discussed in greater detail. This should include native oyster restoration efforts and any necessary coordination.

F2-10

- In June of 2000, the State of Maryland signed the Chesapeake 2000, a new Agreement for restoration of the Chesapeake Bay. This agreement is commonly referred to as "C2K." Together with the Commonwealth of Virginia, the Commonwealth of Pennsylvania, the District of Columbia, the U.S. Environmental Protection Agency and the Chesapeake Bay Commission, the signatories pledged to achieve over 100 specific actions designed to restore the health of the Bay and its living resources. These actions, called the Chesapeake 2000 commitments, are grouped into the Agreement's five major categories. Vital habitat protection and restoration, water quality protection and restoration, sound land use, stewardship and community engagement. The EIS should explain how the proposed action relates to this agreement and any necessary mitigation.

Hazardous Materials/Hazardous Waste

F2-11

- Page 3-29 states, "Military munitions are not considered hazardous waste when used for their intended purposes, which include training of military personnel and research and development activities. This includes almost all missiles, munitions, and targets used at the VACAPES Study Area. A review of the use of munitions and targets was conducted and their hazardous constituents' disposition was analyzed. The components that contain hazardous constituents include propellants, batteries, flares, telemetry, igniters, jet fuel, diesel fuel, hydraulic fluid, and explosive warheads." Hazardous wastes have impacts on the environment regardless of military munitions not considered hazardous waste when used for their intended purposes. It is not clear what exactly is meant by this quote. Does the Navy still consider impacts caused by hazardous waste from military munitions or does it not even evaluate potential impacts because they are used for military intended purposes? This should be clarified in the FEIS.

F2-12

- Page 3-30, states that "Discarded training materials would be deposited in offshore areas, become buried in the sea floor sediment, and have no measurable effects." Is it possible to estimate the amount of training materials to be discarded each year for the proposed action (considering also the cumulative materials from other operations) to reasonably assess an accumulation of debris annually? This figure multiplied by the number of years of intended training would prove to be a better indicator of disposed materials impacting the environment? Are the offshore areas identified where discarded training materials

F2-13 will be deposited? If so, this would be meaningful to identify in the FEIS. In addition, it is noted on page 6-20, "The primary effect of the Navy's training activities in the VACAPES Study Area would be the deposition of expended training materials and their accumulation overtime." Expended training materials, discarded training materials combined with other actions of the same nature could result in a considerable amount of materials in the water/sediments.

F2-14 • Page 3-8—it is unclear why 20 years was used to evaluate accumulation of materials in the ocean. This should be explained. It seems that materials could last longer than 20 years.

F2-15 • Page 3-8 references a study of sediment quality. It is unclear how this study relates to the conditions in the VACAPES Study Area and Bay. More information should be provided. For example are sediment types the same, etc?

F2-16 • We request additional information regarding efforts to minimize and reduce the amounts of hazardous materials deposited into the ocean from training material expenditures.

F2-17 • Bioaccumulation of contaminants in the food chain should be discussed. The DEIS indicates that any contaminants may be spread out over the Study Area will not adversely impact the sediment or water quality. While the Navy believes that in this situation the contaminants may not be directly toxic in water or sediments, the bioaccumulation pathway should be discussed.

Water Quality

F2-18 • Page 3-32 states that "It was determined that no water quality modeling or monitoring was specifically required for a complete and thorough analysis of training operations in the VACAPES Range Complex." The FEIS should discuss the basis for this determination.

F2-19 • Page 6-22 states that "water quality in the marine environment is affected by Gulf Stream currents, temperature and salinity, sediment transport and deposition, and water and air pollutants from inland streams and emissions sources." The DEIS does not address the effect of potential temperature changes caused by the proposed actions on water quality. Potential changes in water temperature should also be discussed in terms of climatic fluctuations and global warming. The cumulative effects from these varied elements should be discussed.

Marine Mammals/ Threatened and Endangered Species

F2-20 • Page 3-139 states that "documented occurrences for the fin whale in the Chesapeake Bay area are from February through May, with the greatest likelihood of encounter between January and March." It is unclear where January comes from.

F2-21

- The FEIS should clearly explain how far the mammals have to be from the sonar to be impacted. Will the monitors be able to see the mammals before they have the potential to be impacted by sonar?

F2-22

- Page 3-193 states that detonations will be suspended if a marine mammal enters the Zone of Influence and will only restart after the area has been clear for a full 30 minutes. What is the rational for 30 minutes?

F2-23

- Page 3-211 and all other appropriate locations – the definition of "no significant impact" to marine mammals under NEPA should be clearly explained.

- The Navy should continue to coordinate with the appropriate state and federal agencies regarding endangered species and Important Bird Areas (page 3-328).

- Up to date coordination letters from other agencies should be provided, including threatened and endangered species.

Historic Preservation

F2-24

- Page 3-329 states, "As part of the NEPA process, consultation will be held with the state historic preservation officers of Delaware, Maryland, Virginia, and North Carolina; American Indian tribes; and public, state, and federal agencies." However, it does not appear that the State Historic Preservation Officers (SHPO) in all of the states are included in the Distribution List in Chapter 10. The FEIS should indicate the level of involvement with the SHPOs. Consultation with the SHPOs throughout the planning process is recommended.

Cumulative Impacts

F2-25

- The DEIS briefly discusses other Navy actions, but should discuss cumulative impacts of these actions in more detail. Will there be any added impact to environmental receptors as a result of these projects? Page 6-8 discusses a 1997 Biological Opinion for the southeastern portion of the United States and a 2002 Biological Opinion for North Carolina. It is unclear if a larger area of the east coast, including the VACAPES Study Area was evaluated. For example could these projects impact marine mammal migration or bird migration?

Miscellaneous

F2-26

- Page 3-364 states that there was coordination with the Federal Aviation Administration (FAA). Does FAA "approve" of the preferred alternative?

F2-27

- Are there additional impacts from the use of contractor aircraft, including increased activity on roads, other transportation issues, etc? This should be discussed in the FEIS.

Comment #S1

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENTAL CONTROL
DIVISION OF SOIL AND WATER CONSERVATION
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

DELAWARE COASTAL
MANAGEMENT PROGRAM

TELEPHONE: (302) 739-9283
FAX: (302) 739-2048

July 23, 2008

Captain J.M. Hinson
Naval Facilities Engineering Command, Atlantic
Code EV22ES
6506 Hampton Boulevard
Norfolk, VA 23508-1278

RE: Virginia Capes Range Complex Draft Environmental Impact Statement
Delaware Department of Natural Resources and Environmental Control Comments

Dear Captain Hinson:

The Delaware Coastal Management Program (DCMP) has conducted a preliminary review of the Virginia Capes Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement.

As this activity will impact coastal resources such as fish and marine mammals, and affect coastal uses such as commercial and recreational fishing, the DCMP will formally review the action for consistency with our federally-approved coastal management program pursuant to National Oceanic & Atmospheric Administration regulations governing Consistency for Federal Agency Activities (15 CFR 930 subpart C). Information on our program can be accessed on the web at http://www.swc.dnrec.delaware.gov/Pages/CoastalMgt.aspx. Requirements for consistency determinations and applicable polices can be accessed on this site under the "Federal Consistency Certification" link. Upon receipt of a complete consistency determination request (concurrent with completion of the Final Environmental Impact Statement as described in Appendix G of the DEIS), the project will be placed on public notice for a period of 20 days. We will complete our review within the 75 day allotted timeframe for review of direct federal actions.

At this time however we submit the following comments for your consideration:

S1-1

Sand Resources

A November 1999 report prepared by the Minerals Management Service titled "Use of Federal Offshore Sand Resources for Beach and Coastal Restoration in New Jersey,

Maryland, Delaware, and Virginia" identified potential borrow areas within the Virginia Capes Range Complex. The DCMP's concern is that expended materials from Navy training exercises may foul areas of usable sand resource, thereby hindering future beach replenishment opportunities. Large sand deposits occur seaward of Indian River Inlet, as well as at Fenwick Shoal, located approximately 10 kilometers east of the Maryland-Delaware border.

Wind Farm Proposal

S1-2 A 450 megawatt capacity wind farm has been proposed approximately 13 miles offshore of Rehoboth Beach, Delaware which is also within the Virginia Capes Range Complex. The Navy should consider this and any future alternative energy projects during its long range planning to avoid potential conflicts. More information on the proposed project can be found on the web at: http://www.bluewaterwind.com/delaware.htm .

If you have any questions regarding these comments or the federal consistency review process please do not hesitate to contact me or Tricia Arndt of my staff at (302) 739-9283.

Sincerely,

Sarah W. Cooksey, Administrator
Delaware Coastal Management Program

SWC/tka
cc: John A. Hughes,Secretary

Comment #S2

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR PROGRAM COORDINATION

ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY

TO: John E. Fisher **DEQ - OEIA PROJECT NUMBER: 08 – 144F**

PROJECT TYPE: ☐ STATE EA / EIR **X FEDERAL EA / EIS** ☐ SCC

☐ CONSISTENCY DETERMINATION/CERTIFICATION

RECEIVED
JUL 21 2008
DEQ-Office of Environmental Impact Review

PROJECT TITLE: VIRGINIA CAPES RANGE COMPLEX

PROJECT SPONSOR: DEPARTMENT OF DEFENSE / DEPARTMENT OF THE NAVY

PROJECT LOCATION: X OZONE MAINTENANCE AREA

REGULATORY REQUIREMENTSMAY BE APPLICABLE TO: **X** **CONSTRUCTION**
☐ OPERATION

STATE AIR POLLUTION CONTROL BOARD REGULATIONS THAT MAY APPLY:

1. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 E – STAGE I
2. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 F – STAGE II Vapor Recovery
3. ☐ 9 VAC 5-40-5490 et seq. – Asphalt Paving operations
4. **X** **9 VAC 5-40-5600 et seq. – Open Burning**
5. **X** **9 VAC 5-50-60 et seq. Fugitive Dust Emissions**
6. ☐ 9 VAC 5-50-130 et seq. - Odorous Emissions; Applicable to_____
7. ☐ 9 VAC 5-50-160 et seq. – Standards of Performance for Toxic Pollutants
8. ☐ 9 VAC 5-50-400 Subpart_____, Standards of Performance for New Stationary Sources, designates standards of performance for the_____
9. ☐ 9 VAC 5-80-10 et seq. of the regulations – Permits for Stationary Sources
10. ☐ 9 VAC 5-80-1700 et seq. Of the regulations – Major or Modified Sources located in PSD areas. This rule may be applicable to the _____
11. ☐ 9 VAC 5-80-2000 et seq. of the regulations – New and modified sources located in non-attainment areas
12. ☐ 9 VAC 5-80-800 et seq. Of the regulations – Operating Permits and exemptions. This rule may be applicable to _____

S2-1 **COMMENTS SPECIFIC TO THE PROJECT:**

Being in an area of ozone maintenance, all precautions are necessary to restrict the emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO_x) during construction.

K. S. Narasimhan

(Kotur S. Narasimhan)
Office of Air Data Analysis

DATE: July 18, 2008

Comment #S3

If you cannot meet the deadline, please notify JOHN FISHER at 804/698-4339 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

MR. JOHN E. FISHER
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319
jefisher@deq.virginia.gov

JOHN E. FISHER
ENVIRONMENTAL PROGRAM PLANNER

COMMENTS

S3-2

We request that the NAVY consult with DHR directly pursuant Section 106 of the National Historic Preservation Act (as amended) and its implementing regulations codified at 36 CFR Part 800 which require Federal agencies to consider the effects of their undertakings on historic properties.

(signed) _____ (date) 7/21/08

(title) ARCHAEOLOGIST

(agency) DHR (FILE #2006-1783)

PROJECT # 08-144F 4/07

Comment #S4

L. Preston Bryant, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

203 Governor Street
Richmond, Virginia 23219-2010
(804) 786-6124

MEMORANDUM

DATE: July 23, 2008

TO: John Fisher, DEQ

FROM: Robert S. Munson, Planning Bureau Manager, DCR-DPRR

SUBJECT: DEQ 08-144F: DOD/Dept of Navy-Virginia Capes Range Complex-City of VA Beach and Counties of Accomack and Northampton

Division of Natural Heritage

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

S4-1 According to the information in our files, several state and federally-listed sea turtles, whales and marine mammals are located in the project vicinity and may be affected by the proposed activity. Due to the legal status of these species, DCR recommends coordination with the Virginia Department of Game and Inland Fisheries (VDGIF), the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) for information regarding the possible impacts to these protected species and to ensure compliance with protected species legislation.

Under a Memorandum of Agreement, DCR represents the Virginia Department of Agriculture and Consumer Services (VDACS) in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

In addition, our files indicate the presence of the Parramore Island State Natural Area Preserve under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters, that may contain information not documented in this letter. Their database may be accessed from www.dgif.virginia.gov/wildlifeinfo_map/index.html, or contact Shirl Dressler at (804) 367-6913.

The remaining DCR divisions have no comments regarding the scope of this project. Thank you for the opportunity to comment.

Cc: Amy Ewing, VDGIF
Tylan Dean, USFWS
Ken Hollingshead, NMFS
Dot Field, DCR-NH – Eastern Shore Regional Steward

Comment #S5

BENNY R. WAMPLER
ACTING DIRECTOR

DIVISIONS
ENERGY
GAS AND OIL
MINED LAND RECLAMATION
MINERAL MINING
MINERAL RESOURCES
MINES
ADMINISTRATION

COMMONWEALTH OF VIRGINIA

Department of Mines, Minerals and Energy
Division of Geology and Mineral Resources
Fontaine Research Park
900 Natural Resources Drive, Suite 500
Charlottesville, Virginia 22903-0667
(434) 951-6341
www.dmme.virginia.gov

July 24, 2008

Virginia Department of Environmental Quality
Office of Environmental Impact Review
629 East Main Street, Sixth Floor
Richmond, Virginia 23219
Attention: John Fisher

Re: Virginia Capes Range Complex
Offshore Virginia

Dear Mr. Fisher:

The Virginia Department of Mines, Minerals and Energy has reviewed the environmental impact report for the above-referenced project. Based on this review I offer the following comments:

S5-1 • The report does not address the impact on, or coexistence with, possible future infrastructure related to development of alternative energy sources such as wind, waves, and currents on the continental shelf, their associated power transportation lines, and their onshore support facilities;

S5-2 • The report does not address the impact of increased activity in this range on the potential exploration and development of offshore mineral or oil and gas resources. Currently, the locations of sand, gravel and contained hard mineral resources are only partially known. The location of oil and gas resources, while suspected based on the geologic environment, are yet to be discovered.

• If permanent offshore structures are not being constructed and potential mineral and energy extraction sites can co-exist with planned training exercises, expanded training activities within the outlined area would have minimal impact on development of mineral or energy resources.

Please contact me at (434) 951-6350 if I can be of further assistance.

Sincerely,

Edward E. Erb, Ph.D.
State Geologist and Director

For
Matt Heller, P.G.
Geologist Manager

Comment #S6

MARYLAND ENVIRONMENTAL SERVICE

Martin O'Malley, Governor | James M. Harkins, Director

August 5, 2008

Department of the Navy
Commander
Naval Facilities Engineering Command, Atlantic
Code EV22ES (VACAPES EIS/OEIS PM)
6506 Hampton Boulevard
Norfolk, VA 23508-1278

Re: Virginia Capes (VACAPES) Range Complex
Draft Environmental Impact Statement (DEIS)/Overseas Environmental Impact Statement (OEIS)
Response for Request for Comments on the DEIS/OEIS

Dear Commander,

Maryland Environmental Service (MES) has received your request for review and comment on the above-referenced report. While MES considers the needs of its clients such as the Maryland Port Administration (MPA), MES' review should not be misconstrued as recommendations on the part of, or as a substitute for coordination with, such agencies.

Based on a cursory review of the DEIS/OEIS, MES is providing the following comments in relation to the response letter submitted by the agency (dated October 5, 2007) concerning location information for the VACAPES project:

MES and/or Maryland Port Administration Project Areas

- The VACAPES Range Complex does not geographically overlap any current dredging operations, dredged material containment facilities, or mitigation projects that MES/MPA may be involved with.

Maryland Pilots Association

- MES previously recommended that the Navy consult with the Maryland Pilots Association regarding whether the project will affect Maryland Pilots Association's activities in the area, if applicable. Based on the contents of this DEIS/OEIS, it is unclear whether this correspondence has occurred.

NOAA's Ship Speed Reduction Strategy

S6-1

- MES previously recommended that the Navy coordinate with National Oceanic and Atmospheric Administration (NOAA) on the ship speed reduction strategy for commercial shipping to prevent ship collisions with the Northern Right Whale. It is noted in the DEIS/OEIS that surface vessels operating in the VACAPES Range Complex

259 Najoles Road • Millersville, Maryland • 21108
phone 410-729-8200 • fax 410-729-8220 • www.menv.com

during the Northern Right Whale coastal migration timeframe will be required to employ special measures to avoid vessel-whale interactions.

Commercial Ship Traffic

- The map of the VACAPES OPAREA (Figure 3.13-2) shows the VACAPES Range Complex to overlap commercially used waterways in the Mid-Atlantic area. Section 6.4.13.1 of the DEIS/OEIS concludes that military and civilian uses of offshore areas are compatible as demonstrated by current conditions: "Where naval vessels and aircraft are conducting operations that are not compatible (for example, hazardous weapons firing), they are confined to the Operating Area (OPAREA) away from shipping lanes". The same section of the report identifies potential impacts to transportation as "short-term" and producing "temporary access limitations to commercial and recreational interests". Specifically, the report identifies two precautionary areas for surface vessels entering the lower Chesapeake Bay through regularly used shipping channels (Figure 3.13-3). The precautionary measures proposed for these areas and their potential to affect commercial traffic are not thoroughly described. MES recommends that the Navy coordinate with MPA on this issue to confirm that there will be no financial loss to the Port of Baltimore or associated industry due to changes in ship speed or other circumstances in the precautionary areas. S6-2

With regard to MES's plans, programs and objectives, the majority of the regulations affecting the proposed action appear to be regulated or enforced by other State and Federal agencies. Therefore, MES defers to each responsible agency for concurrence on these components (US Fish and Wildlife Service for Endangered species concerns, U.S. Department of Transportation for waterborne transportation concerns).

Thank you for providing MES with an opportunity to comment on the proposed project. Please direct any questions regarding this correspondence or additional requested information to Cecelia L. Donovan of my staff at (410) 729-8200.

Sincerely,

Cecelia L. Donovan for

Charles Madison
Executive Director
Technical and Environmental Services

Attachments
Cc: J. Harkins, J. O'Neill, C. Madison, C. Donovan, T. Banta, K. Cushman, MES
N. Brown, MPA
J. Hamill, Association of Maryland Pilots

Comment #S7

Fisher,John

From: Ewing, Amy (DGIF)
Sent: Thursday, August 07, 2008 5:01 PM
To: Fisher,John
Cc: Boettcher, Ruth (DGIF)
Subject: ESSLog# 23238_08-144F_VACAPES

23238_012307_VACAPES_DEIS.doc ...

John, please let me know if you are able to incorporate these into the DEQ response or if we need to send these separately to the Navy. Thanks for your patience! Amy

We have reviewed the draft EIS for the subject project. This project proposes several alternatives for testing and training activities in in the Virginia Capes Range Complex located in the southern Chesapeake Bay and Atlantic Ocean. The no action alternative maintains current training operations and levels. Alternative 1 maintains current training operations and increases operational training, expands warfare missions and accommodates for force structure changes. Alternative 2, the preferred alternative includes all operations in Alternative 1 plus additional mine warfare training, establishment of mine warfare training areas with small fields of mine shapes, and implements additional enhancements to meet future training requirements.

We submitted the attached comments to the Navy during their scoping for the EIS in 2007. Overall, we feel that many of the recommended topics of discussion were covered in the draft EIS. However, we still have some concerns, as detailed below, and recommend further considering the attached comments and the sources for information provided within.

General Comments:

S7-1 The seabird and migratory section of the DEIS makes no mention of coastal avian species that nest on the barrier islands and ocean facing beaches directly adjacent to the VACAPES study area. In Virginia, these species include the Federally Threatened piping plover, State Endangered Wilson's plover, American oystercatcher, which is ranked nationally as a high conservation priority species according to the U.S. Shorebird Conservation Plan, and black skimmer. All of the species are migratory and may occur within the VACAPES complex before, during and after the breeding season which extends from April - September. Moreover, some of the seabirds listed in Table 3.10-2 breed on beaches adjacent to the VACAPES study area and may forage in federal waters (i.e., beyond the 3 nm state line). In addition, numerous species of shorebirds including the red knot, a candidate species for federal listing, are likely to occur in the study area, as are migrating and wintering sea ducks. Lastly, the DEIS does not address the possibility of migratory landbirds that likely select nearshore and offshore pathways.

S7-2 The DEIS does not include any mention of bird, sea turtle, and marine mammal occurrences (or takes) observed during past training operations within VACAPES. If such information exists, we recommend it be included in the EIS.

S7-3 The discussion on impacts of expended materials including chaff fibers, end caps, and pistons which may concentrate in sargassum grass rafts and convergence zones where sea turtle hatchlings occur and seabirds forage, respectively, is highly speculative. We recommend that an effort be made to measure the level of chaff in sargassum grass following current training operations using chaff and the impacts of this on sea turtles and their hatchlings and birds, as well as other species that may use these grass amts for cover and foraging.

S7-4 The DEIS section on seabirds and migratory birds does not address potential disturbance that mine warfare training in the lower Chesapeake Bay, which entails low flying helicopters towing mine detecting equipment, may have on breeding shorebirds, wading

birds, waterfowl, rails, and seabirds that nest in the marshes and beaches along the eastern and western shores of the lower Chesapeake during the months of April - August. Nor did it discuss potential effects of these activities on the large numbers of sea ducks and sea birds (e.g., gulls, gannets, terns) that winter in the lower Chesapeake Bay. We recommend that the DEIS discuss potential disturbances and impacts upon these species occurring from mine warfare training.

S7-5 Any increase in activity over that which currently takes place (as described in the No Action Alternative) is likely to result in an increase in impacts upon the waters of the project area and the species that inhabit these waters. We recommend that any discussion about cumulative impacts consider the magnitude of the increase in impacts with the addition of each activity.

S7-6 We recommend continued coordination with the USFWS regarding possible impacts upon federally listed species and with our agency regarding impacts upon federal and state-listed species. Ruth Boettcher, VDGIF Eastern Shore Biologist, may be contacted at 757-787-5911 with any questions or to request data or information regarding the species and resources mentioned above.

Chapter 3 - Affected Environment

S7-7 3.7 - Marine Mammals:
Harbor seal, harp seal, and gray seal occurrences in the inshore and nearshore waters of the mid-Atlantic region are becoming more frequent in the fall and winter months (VA Aquarium Stranding Response Program, pers. comm.). We recommend inclusion of this, along with any necessary discussion, in the marine mammal section.

S7-8 3.8 - Sea Turtles
Green sea turtles do nest on beaches adjacent to the VACAPES complex (i.e., northern outer banks of North Carolina; one documented nest reported in VA Beach in 2005).

S7-9 Leatherback nesting has been documented on the Outer Banks of NC and has been increasing in the state over the last decade (M. Godfrey, NC Wildlife Resources Commission, pers. comm).

S7-10 The section on sea turtle density estimates should be recalculated using more recent data on sea turtle surfacing times, behavior and detectability rates that can be found in:
Mansfield, K. L. 2006. Sources of mortality, movements, and behavior of sea turtles in Virginia. Ph.D. diss. The College of William and Mary, VA. Pp. 343.

S7-11 Recent data presented in the Loggerhead sea turtle 5 year review: summary and evaluation suggests that three of the four US loggerhead nesting subpopulations (i.e., South Florida, Florida Panhandle and Northern nesting subpopulations) are decreasing.

We would be happy to provide the Navy with information regarding sea turtle documentations from Virginia.

S7-12 3.10 - Seabirds and Migratory Birds
Many of the seabird occurrence periods listed in Table 3.10-2 are incorrect. We would be happy to provide supportive data and recommended occurrence dates for inclusion in this table.

Again, we re-iterate that there is no mention in the DEIS about the occurrence of or impacts upon Federally Threatened piping plover, State Endangered Wilson's plover, American oystercatcher, which is ranked nationally as a high conservation priority species according to the U.S. Shorebird Conservation Plan, and black skimmer. We recommend further consideration of these species and the possible impacts upon them.

Chapter 5 - Mitigation

S7-13 Mitigation measures for most training exercises are largely comprised of maintaining lookouts or watchstanders to look for marine mammals, sea turtles, rafts of sargassum grass and other indicators of biological activity in the buffer zones or zones of impact. Depending on the type of exercise and the organism/habitat/activity observed, measures will be taken to avoid or minimize the potential for disturbance, injury or death. As such, most mitigation measures rely entirely on the observers' ability to detect sea turtles, marine mammals, and indicators of their presence such as sargassum grass under

all conditions (e.g., high seas, after dark, storms, etc.). The DEIS does not include an assessment of the detection probabilities on the part of lookouts in any and all conditions, which makes it difficult to quantify overall impacts on these species. We recommend some discussion about the effectiveness of lookouts and watchstanders and their ability to assist in avoidance of impacts upon marine mammals and turtles. We recommend some discussion about training for such lookouts and the procedures they are to follow.

S7-14 The DEIS lacks any mitigation measures for seabirds, shorebirds and other migratory and breeding species occurring within the VACAPES study area and which are likely to be adversely impacted by this project.

S7-15 VDGIF commends the Navy for its development of an Integrated Comprehensive Monitoring Program (ICMP) that may incorporate state of the art monitoring technologies designed specifically for marine species. In order to fully understand the Navy's future commitment towards adequately minimizing impacts on these species, we request that the final ICMP be included in the EIS, if possible.

Thank you.

Amy M. Ewing
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries
4010 West Broad Street
Richmond, VA 23230
804-367-2211
amy.ewing@dgif.virginia.gov

Comment #S7

January 23, 2007

Naval Facilities Engineering Command, Atlantic
Attn: Code EV21 (VACAPES EIS PM)
6506 Hampton Blvd.
Norfolk, VA 23508-1278

RE: VACAPES Range Complex
Project Scoping
ESS 23238

To Whom It May Concern:

The Department of Game and Inland Fisheries (VDGIF), as the Commonwealth's wildlife and freshwater fish management agency, exercises enforcement and regulatory jurisdiction over those resources, inclusive of state or federal endangered or threatened species, but excluding listed insects. We are a consulting agency under the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), and we provide environmental analysis of projects or permit applications coordinated through the Virginia Department of Environmental Quality, the Virginia Marine Resources Commission, the U.S. Army Corps of Engineers, and other state or federal agencies. Our role in these procedures is to determine likely impacts upon fish and wildlife resources and habitats, and to recommend appropriate measures to avoid, reduce, or compensate for those impacts.

We have reviewed the Project Scoping Package for this project and information presented at a public scoping meeting, and we offer the following comments. This project involves current and future U.S. Navy activities in the Virginia Capes Range Complex (VACAPES). The VACAPES Range Complex encompasses Delaware, Maryland, Virginia and North Carolina, and incorporates air, land, and sea spaces that extend 155 nautical miles into the Atlantic Ocean. Future activities will include increased Unmanned Aerial Vehicle training, Support Littoral Combat Ship warfare missions, and construction of an Instrumented Minefield Training Area.

We understand the Navy will be releasing a draft Environmental Impact Statement (DEIS) in 2008 to ensure that its current and proposed future operations within the VACAPES Range Complex are in compliance with the National Environmental Policy Act (NEPA). The intent of the EIS is to assess the effects of the Navy's ongoing and anticipated operations on environmental, natural, cultural, and socioeconomic resources within the Range Complex. The Navy is currently in the scoping phase of the NEPA process and is seeking input from government agencies, organizations, and the public on economic, cultural, and environmental

issues that should be addressed in the DEIS. The following comments describe those issues that we feel should be addressed:

Description of Impact Area

Virginia's Nearshore and Offshore Waters:

These waters likely support seasonal or year round occurrences of the Federal Threatened loggerhead sea turtle (*Caretta caretta*), Federal Endangered Kemp's Ridley sea turtle (*Lepidochelys kempii*), Federal Threatened green sea turtle (Chelonia mydas), and Federal Endangered leatherback sea turtle (*Dermochelys coriacea*). Additionally, the Range Complex at-sea training area may fall within the ranges of several marine mammal species including the Federal Endangered northern right whale (*Balaena glacialis*), Federal Endangered humpback whale (*Megaptera novaeangliae*), Federal Endangered sei whale (*Balaenoptera borealis*), and Federal Endangered fin whale (*Balaenoptera physalus*). The VACAPES Range Complex likely encompasses important migration and wintering habitats for red phalarope (*Phalaropus fulicaria*), red-necked phalarope (*Phalaropus lobatus*), and a variety of seabirds and sea ducks. Moreover, thousands of seabirds pass through Virginia's nearshore and offshore waters. To date, little is known about landbird occurrences over these waters. However, preliminary results from the Eastern Shore Dual-Polarimetric Radar (NPOL) study, which examined local fall landbird migration patterns via radar, suggest that some fall landbird migrants may follow offshore flight paths.

Eastern Shore of Virginia:

The Eastern Shore of Virginia includes 14 barrier islands located along the seaward margin of the Delmarva Peninsula, an extensive lagoonal saltmarsh system (hereafter referred to as the seaside lagoon system) nestled between the barrier island chain and the lower Delmarva Peninsula, and the Delmarva Peninsula itself which is bordered on either side by the seaside lagoon system and the Chesapeake Bay. The barrier islands are owned and/or managed by federal (U.S. Fish and Wildlife Service), state (VA Department of Conservation and Recreation - Division of Natural Heritage) and private (The Nature Conservancy's - VA Coast Reserve) conservation agencies. Thus, they are protected from development in perpetuity, with exception of Wallops Island and a few private in-holdings. This pristine barrier island chain is an important breeding area for a number of beach nesting shorebirds and seabirds that are of high conservation concern, including the Federal Threatened piping plover (*Charadrius melodus*), State Endangered Wilson's plover (*C. wilsonia*), State Threatened gull-billed tern (*Sterna nilotica*), State Special Concern least tern (*S. antillarum*), and American oystercatcher (*Haematopus palliatus*), which is ranked nationally as a high conservation priority species according to the U.S. Shorebird Conservation Plan. Assateague Island supports Virginia's only viable population of the Federal Endangered Delmarva fox squirrel (*Sciurus niger cinereus*). The entire barrier island chain and seaside lagoon system supports numerous species of breeding colonial waterbirds (wading birds, gulls, skimmers, pelicans, and terns), marshbirds, waterfowl, shorebirds, passerines, and raptors, including the Federal Threatened bald eagle (*Haliaeetus*

leucocephalus) and State Threatened peregrine falcon (*Falco peregrinus*). Both areas serve as globally important migration corridors, stopover sites, and wintering areas for thousands of shorebirds, waterfowl, and landbirds annually. Moreover, the barrier islands and the seaside lagoon system support significant numbers of nesting Federal Species of Concern diamondback terrapins (*Malaclemys terrapin*) and the island chain provides breeding habitat for loggerhead sea turtles.

The lower Delmarva Peninsula serves as a geographic funnel for millions of migratory birds in the fall. In that area, birds rest, feed, and wait for favorable winds to assist them in crossing the Chesapeake Bay. Since 1963, a songbird banding station located at Kiptopeke State Park, near the peninsula's southern tip, has banded over 300,000 neo-tropical and temperate landbirds of 158 species. This is a clear demonstration of the area's use as a fall migration stopover site, and one of the most important land bird staging areas along the Atlantic flyway. Virginia's portion of the Delmarva Peninsula also supports over 35 nesting pairs of bald eagles, numerous wading bird colonies, and a myriad of breeding land birds such as songbirds, owls, and hawks. Moreover, the peninsula's vast system of bayside and seaside wetlands and creeks that intersect the peninsula provide vital ecological services for humans and wildlife alike.

Virginia's Southern Mainland Beaches:

Virginia's southern ocean-facing beaches that extend from Ft. Story Military Reservation south to the Virginia/North Carolina border provide nesting habitat for loggerhead sea turtles and, on a rare occasion, green sea turtles (the first and only green turtle nest in Virginia was recorded in 2005 at Sandbridge Beach, VA). The state's only known population of State Endangered chicken turtle (*Deirochelys reticularia*) resides at Seashore State Park just south of Fort Story. The freshwater bays and impoundments at Back Bay National Wildlife Refuge and False Cape State Park, located near the state line, support large flocks of waterfowl in the fall and winter, while the beaches and upland areas provide resting habitat for migrating shorebirds and songbirds in the spring. Lastly, many species of reptile and amphibian are found on refuge and state park property.

DEIS Recommendations:

The Navy is prepared to examine the potential impacts current and future training operations have or will have on the following environmental resources: marine mammals, sea turtles, birds, fish, wetlands, invertebrates, corals, wildlife and plants, air quality, water quality, hazardous materials, cultural assets, and socioeconomics. Given the diversity, ecological importance, and extreme sensitivity of Virginia's coast and adjacent waters, the VDGIF has developed a list of recommendations for the Navy to consider in its development of the DEIS. Most of the recommendations are meant to encourage the Navy to provide sufficient information on training operations and its potential impact on the environment. Below the recommendations, we also list individuals (and their contact information) who may be able to offer additional information on Virginia's coastal wildlife resources.

S7-16 1. The evaluation of impacts (including research and monitoring activities) and natural resource protection measures included in the VACAPES Range Complex DEIS should be consistent with those incorporated in other Range Complex DEIS's in order to afford the greatest protection for migrating species that cross training range boundaries (i.e., sea turtles, marine mammals, birds).

S7-17 2. To the greatest extent possible, the DEIS should include detailed descriptions of all current and predicted future training operations (i.e., those that are in the process of being developed). The descriptions for each operation should include, but not be limited to: the space (i.e., land, sea and/or air) operations will occur in; the type of equipment and supporting infrastructure required; time of year (seasonality) and time of day the operations are likely to occur; length and frequency of each operation; existing and proposed mitigation measures for those operations that directly or indirectly impact natural resources; and all potential training alternatives, particularly those that are less disruptive to coastal wildlife resources. For those operations that do not have alternative training options listed, the DEIS should include justification for why that is the case.

S7-18 3. All natural resource impact assessments should encompass the entire annual cycle rather than just the season or window of time when the operations are predicted to occur, in case training operations are conducted outside of the scheduled time frame.

S7-19 4. All wildlife resource impact assessments should address effects on associated prey species and foraging habitats.

S7-20 5. All natural resource impact assessments must consider the short and long term effects on all land, water, and air space habitats within the effected area.

S7-21 6. The Navy should attempt to make available on-line all gray literature that is cited in the DEIS.

S7-22 7. The DEIS should assess natural resource impacts of transporting training aircraft, ships, small watercraft, vehicles, equipment, and supplies to and from the Hampton Roads naval bases and the training range complex.

S7-23 8. To the greatest extent possible, the Navy should avoid duplicating training operations among the different U.S. Range Complexes as one way to minimize natural resource impacts over a broad geographic area.

Local and regional sources of information on Virginia's coastal wildlife resources:

1. Onshore, nearshore, and offshore movements of migratory landbirds - Sarah Mabey, NC State University (sarah_mabey@ncsu.edu) and Bryan Watts, Center for Conservation Biology at the College of William and Mary (bdwatt@mail.wm.edu)

2. Offshore distribution, abundance, and movement patterns of seabirds - Doug Forsell, U.S. Fish and Wildlife Service (doug_forsell@fws.gov) and Gary Costanzo, VDGIF (Gary.Costanzo@dgif.virginia.gov)

3. Onshore, nearshore, and offshore movements of migratory shorebirds - Barry Truitt, The Nature Conservancy (btruitt@tnc.org), Manomet Center for Conservation Sciences (ph. 508-224-6521) and Ruth Boettcher, VDGIF (ruth.boettcher@dgif.virginia.gov)

4. Offshore distribution, abundance, and movement patterns of marine mammals - Sue Barco, Virginia Aquarium and Marine Science Center (ocrab@erols.com)

5. Offshore distribution, abundance, and movement patterns of sea turtles - Jack Musick, VA Institute of Marine Science (jmusick@vims.edu) and Kate Mansfield, VA Institute of Marine Science (ktlm@vims.edu)

6. Nesting sea turtles in Virginia - Ruth Boettcher, VDGIF (ruth.boettcher@dgif.virginia.gov) and Dorie Stolley, Back Bay NWR (Dorie_Stolley@fws.gov)

7. Colonial waterbirds and shorebirds on Virginia's barrier islands and within the seaside lagoon system - Barry Truitt, The Nature Conservancy (btruitt@tnc.org), Alex Wilke, The Nature Conservancy (awilke@tnc.org), Mike Erwin, University of Virginia (mre5g@cms.mail.virginia.edu), and Ruth Boettcher, VDGIF (ruth.boettcher@dgif.virginia.gov)

8. Chincoteague National Wildlife Refuge (CNWR) and its natural resources - Bill Haglan, CNWR (William_Haglan@fws.gov)

9. Eastern Shore of Virginia National Wildlife Refuge (ESVNWR) and its natural resources - Pam Denmon, ESVNWR biologist (Pam_Demon@fws.gov)

10. Back Bay National Wildlife Refuge (BBNWR) and its natural resources - Dorie Stolley, BBNWR biologist (Dorie_Stolley@fws.gov) and John Gallegos, BBNWR biologist (John_Gallegos@fws.gov)

11. Eastern Shore plants and protected insects - Dot Field, VA. Dept. of Conservation and Recreation - Div. of Natural Heritage (Dot.Field@dcr.virginia.gov)

12. Amphibians and non-marine reptiles on Virginia's coastal plain - John (JD) Kleopfer, VDGIF (John.Kleopfer@dgif.virginia.gov)

Thank you for the opportunity to comment on this scoping request. Please contact me at 804-367-2733 if we can be of further assistance.

Sincerely,

Andrew K. Zadnik
Environmental Services Biologist

Comment #S8

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
TDD (804) 698-4021
www.deq.virginia.gov

L. Preston Bryant, Jr.
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

August 11, 2008

Commander, Naval Facilities Engineering Command, Atlantic
Code EV22ES (VACAPES EIS/OEIS PM)
6506 Hampton Boulevard
Norfolk, Virginia 23508-1278

RE: Draft Environmental Impact Statement/Overseas Environmental Impact Statement for the Virginia Capes Range Complex, U.S. Navy (DEQ 08-144F).

Dear Commander:

The Commonwealth of Virginia has completed its review of the Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS/OEIS) for the Virginia Capes Range Complex (received July 2, 2008) for the above-referenced project. The Department of Environmental Quality (DEQ) is responsible for coordinating Virginia's review of federal environmental documents and responding to appropriate federal officials on behalf of the Commonwealth. DEQ is also responsible for coordinating Virginia's review of federal consistency determinations (FCDs) submitted pursuant to the Coastal Zone Management Act (CZMA) and providing the state's response. The following agencies participated in the review of the DEIS/OEIS for this proposal:

Department of Environmental Quality
Department of Conservation and Recreation
Department of Game and Inland Fisheries
Virginia Institute of Marine Science
Department of Mines, Minerals, and Energy
Department of Historic Resources
Accomack County
Hampton Roads Planning District Commission

The Virginia Marine Resources Commission, Department of Aviation, City of Virginia Beach, Northampton County, and the Accomack-Northampton Planning District Commission were invited to comment on the proposal.

PROJECT DESCRIPTION

The DEIS/OEIS submitted by the Department of the Navy (Navy) assesses the potential environmental impacts in the Virginia Capes (VACAPES) Range Complex over a 10-year planning horizon. The proposed actions that are evaluated are associated with Navy Atlantic Fleet training; research, development, testing, and evaluation (RDT&E) activities; and associated range capabilities enhancements, including infrastructure improvements. Basic training operations typically conducted on the VACAPES Range Complex include:

- Mine Warfare (MIW), including mine countermeasures and mine neutralization;
- Surface Warfare (SUW), including missile exercise (MISSILEX) (air-to-surface), gunnery exercise (GUNEX) (air-to-surface), GUNEX (surface-to-surface), bombing exercise (BOMBEX), and laser targeting;
- Air Warfare (AW), including air combat maneuvers (ACM), air intercept control, MISSILEX (air-to-air and surface-to-air), detect to engage, and GUNEX (air-to-air and surface-to-air);
- Strike Warfare (STW), including High-speed Anti-radiation Missile (HARM) exercises and GUNEX (air-to-surface);
- Electronic Combat (EC), including electronic combat operations, chaff exercise, and flare exercise (aircraft self-defense);
- Amphibious Warfare (AMW), including firing exercises (FIREX) with Integrated Maritime Portable Acoustic Scoring and Simulator System (IMPASS); and
- Test and Evaluations, including Shipboard Electronic Systems Evaluation Facility (SESEF) utilization.

The components of the VACAPES Range Complex include:

- 28,672 square nautical miles (nm2) of special use area (SUA) warning area;
- 27,661 nm2 of offshore surface and subsurface operating area (OPAREA); and
- 18,092 nm2 of deep ocean area greater than 100 fathoms (600 feet).

The geographic scope includes the airspace, seaspace, and undersea space of the VACAPES Range Complex. The VACAPES Study Area does not include any dry land. However, it does include the area from the mean high tide line east (seaward) to the 3-nautical-mile (nm) boundary of Virginia waters. This 3-nm state boundary also serves as the western boundary of the VACAPES OPAREA. The VACAPES Study Area also includes 420 nm2 of the lower Chesapeake Bay, where proposed Mine Warfare (MIW) training would occur.

CONCLUSION

Provided the proposed activities are performed in accordance with the recommendations which follow, this project is unlikely to have significant effects on ambient air quality, protected plants and insect species, water quality and wetland resources of the Commonwealth. However, based on the information provided by the Department of Game and Inland Fisheries concerning wildlife resources, there are some deficiencies, information gaps, and inaccuracies in the DEIS/OEIS that should be corrected in the Final EIS. These inadequacies are identified in the Impacts and Mitigation section of this report under Item 1 discussing Wildlife Resources.

S8-1 The Navy should coordinate closely with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service and the Virginia Department of Game and Inland Fisheries to ensure that impacts on protected species including sea turtles, whales and marine mammals are adequately avoided and minimized.

S8-2 Also, the Final EIS should address potential impacts on offshore energy resources identified in the Impacts and Mitigation section of this report under Item 4.

ENVIRONMENTAL IMPACTS AND MITIGATION

1. Wildlife Resources and Protected Species. The DEIS/OEIS includes discussion and analysis of the potential impacts of Navy Atlantic Fleet training, research, development, testing, and evaluation activities on marine mammals, sea turtles, fish and bird species in the study area. The document concludes that these activities would have no significant impacts on marine mammals, sea turtles, fish populations and habitats, and birds.

1(a) Agency Jurisdiction. The Department of Game and Inland Fisheries (DGIF), as the Commonwealth's wildlife and freshwater fish management agency, exercises enforcement and regulatory jurisdiction over wildlife and freshwater fish, including state or federally listed endangered or threatened species, but excluding listed insects (*Virginia Code* Title 29.1). The DGIF is a consulting agency under the *U.S. Fish and Wildlife Coordination Act* (16 U.S.C. sections 661 et seq.), and provides environmental analysis of projects or permit applications coordinated through DEQ and several other state and federal agencies. DGIF determines likely impacts upon fish and wildlife resources and habitat, and recommends appropriate measures to avoid, reduce, or compensate for those impacts.

1(b) Agency Comments. The following section summarizes general comments on the Draft EIS/OEIS and comments on specific chapters submitted by DGIF. The complete text of DGIF comments is attached. The DGIF previously submitted comments in a January 23, 2007 letter to the Navy during the scoping phase of the DEIS which

provided a list of recommendations for the Navy's consideration (see attached letter). Many of the topics recommended by DGIF were discussed in the DEIS. However, DGIF has identified several issues which should be addressed in the Final EIS.

General Comments on Deficiencies in the Information Provided in the DEIS:

According to DGIF, the DEIS/OEIS does not discuss the following:

S8-3 (i) coastal avian species that nest on the barrier islands and ocean-facing beaches directly adjacent to the VACAPES study area. In Virginia, these species include:

- piping plover (Federally-listed Threatened);
- Wilson's plover (State Endangered);
- American oystercatcher (ranked nationally as a high conservation priority species according to the U.S. Shorebird Conservation Plan); and
- black skimmer.

All of the species are migratory and may occur within the VACAPES complex before, during and after the breeding season which extends from April through September. Some of the seabirds listed in the document (Table 3.10-2) breed on beaches adjacent to the VACAPES study area and may forage in federal waters (i.e., beyond the 3 nm state line). Numerous species of shorebirds including the red knot, a candidate species for federal listing, are likely to occur in the study area, as are migrating and wintering sea ducks.

S8-4 (ii) possibility of the presence of migratory landbirds that are likely to select nearshore and offshore pathways.

S8-5 (iii) sea turtle, and marine mammal occurrences (or takes) observed during past training operations within VACAPES.

S8-6 (iv) potential disturbance that mine warfare training in the lower Chesapeake Bay, which entails low flying helicopters towing mine detecting equipment, may have on breeding shorebirds, wading birds, waterfowl, rails, and seabirds that nest in the marshes and beaches along the eastern and western shores of the lower Chesapeake during the months of April through August. Furthermore, the document does not discuss the potential effects of these activities on the large numbers of sea ducks and sea birds (e.g., gulls, gannets, terns) that winter in the lower Chesapeake Bay.

S8-7 In addition, DGIF finds the discussion in the document of the impacts of expended materials, (chaff fibers, end caps, and pistons) which may concentrate in sargassum grass rafts and convergence zones where sea turtle hatchlings occur and seabirds forage, is highly speculative.

Specific Comments

Chapter 3-Affected Environment

S8-8

3.7 - Marine Mammals:

Harbor seal, harp seal, and gray seal occurrences in the inshore and nearshore waters of the mid-Atlantic region are becoming more frequent in the fall and winter months (VA Aquarium Stranding Response Program, pers. comm.).

S8-9

3.8 - Sea Turtles

Green sea turtles nest on beaches adjacent to the VACAPES complex (i.e., northern outer banks of North Carolina; one documented nest reported in VA Beach in 2005).

Leatherback nesting has been documented on the Outer Banks of NC and has been increasing in the state over the last decade (M. Godfrey, NC Wildlife Resources Commission, pers. comm).

Recent data presented in the Loggerhead sea turtle 5-year review, summary and evaluation suggests that three of the four US loggerhead nesting subpopulations (i.e., South Florida, Florida Panhandle and Northern nesting subpopulations) are decreasing. DGIF can provide the Navy with information regarding sea turtle documentations from Virginia.

3.10 - Seabirds and Migratory Birds

S8-10

Many of the seabird occurrence periods listed in the document (Table 3.10-2) are incorrect. DGIF can provide supportive data and recommended occurrence dates to the Navy for inclusion in this table.

Chapter 5 - Mitigation

S8-11

DGIF notes that mitigation measures presented in the DEIS/OEIS for most training exercises are largely comprised of maintaining lookouts or watchstanders to look for marine mammals, sea turtles, rafts of sargassum grass and other indicators of biological activity in the buffer zones or zones of impact. Depending on the type of exercise and the organism, habitat, or activity observed, measures will be taken to avoid or minimize the potential for disturbance, injury or death. As such, most mitigation measures rely entirely on the observers' ability to detect sea turtles, marine mammals, and indicators of

their presence such as sargassum grass under all conditions (e.g., high seas, after dark, storms, etc.). The DEIS/OEIS does not include an assessment of the detection probabilities on the part of lookouts in any and all conditions, which makes it difficult to quantify overall impacts on these species.

S8-12 The document lacks any mitigation measures for seabirds, shorebirds and other migratory and breeding species occurring within the VACAPES study area and which are likely to be adversely impacted by this project.

S8-13 DGIF commends the Navy for its development of an Integrated Comprehensive Monitoring Program (ICMP) that may incorporate state of the art monitoring technologies designed specifically for marine species. In order to fully understand the Navy's future commitment towards adequately minimizing impacts on these species, the final ICMP should be included in the Final EIS, if possible.

1(c) Recommendations. DGIF recommends that the Final EIS/OEIS include the following:

- S8-14 a discussion of bird, sea turtle, and marine mammal occurrences (or takes) observed during past training operations within VACAPES;
- S8-15 a discussion of the level of chaff in sargassum grass following current training operations using chaff and the impacts of this on sea turtles and their hatchlings and birds, as well as other species that may use these grass mats for cover and foraging;
- S8-16 a discussion of potential disturbances and impacts of low flying helicopters towing mine detecting equipment upon seabirds and migratory birds from mine warfare training;
- S8-17 a discussion of the increases in harbor seal, harp seal, and gray seal occurrences in the inshore and nearshore waters of the mid-Atlantic region in the marine mammal section;
- S8-18 a recalculation of sea turtle density estimates using more recent data on sea turtle surfacing times, behavior and detectability rates (see Mansfield, K. L. 2006. Sources of mortality, movements, and behavior of sea turtles in Virginia. Ph.D. diss. The College of William and Mary, VA. Pp. 343);
- S8-19 a discussion of the effectiveness of lookouts and watchstanders and their ability to assist in avoidance of impacts upon marine mammals and turtles;
- S8-20 a discussion on training and procedures for lookouts and watchstanders; and
- S8-21 inclusion of the Navy's Integrated Comprehensive Monitoring Program (ICMP) in the final EIS/OEIS.

Contact Amy Ewing, DGIF at (804) 367-2733, for additional information regarding these

comments.

2. Natural Heritage Resources. The DEIS/OEIS does not specifically address natural heritage resources.

2(a) Agency Jurisdiction The mission of the Virginia Department of Conservation and Recreation (DCR) is to conserve Virginia's natural and recreational resources. DCR supports a variety of environmental programs organized within seven divisions including the Division of Natural Heritage. The Natural Heritage Program's (DCR-DNH) mission is conserving Virginia's biodiversity through inventory, protection, and stewardship. The *Virginia Natural Area Preserves Act*, 10.1-209 through 217 of the *Code of Virginia*, was passed in 1989 and codified DCR's powers and duties related to statewide biological inventory: maintaining a statewide database for conservation planning and project review, land protection for the conservation of biodiversity, and the protection and ecological management of natural heritage resources (the habitats of rare, threatened, and endangered species, significant natural communities, geologic sites, and other natural features).

S8-22

2(b) Agency Comments. DCR-DNH searched its Biotics Data System for occurrences of natural heritage resources in the project area. According to the information in DCR files, several state and federally-listed sea turtles, whales and marine mammals are located in the project vicinity and may be affected by the proposed activity.

2(c) State-listed Plant and Insect Species. The *Endangered Plant and Insect Species Act of 1979*, Chapter 39 §3.1-1020 through 1030 of the *Code of Virginia*, as amended, authorizes the Virginia Department of Agriculture and Consumer Services (VDACS) to conserve, protect, and manage endangered and threatened species of plants and insects. The VDACS Virginia Endangered Plant and Insect Species Program personnel cooperates with the U.S. Fish and Wildlife Service (USFWS), DCR-DNH and other agencies and organizations on the recovery, protection or conservation of listed threatened or endangered species and designated plant and insect species that are rare throughout their worldwide ranges. In those instances where recovery plans, developed by USFWS, are available, adherence to the order and tasks outlined in the plans are followed to the extent possible.

Under a Memorandum of Agreement established between VDACS and DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. DCR finds that the current activity will not affect any documented State-listed plants or insects.

2(d) State Natural Area Preserves. DCR files indicate the presence of the Parramore Island State Natural Area Preserve under DCR's jurisdiction in the project vicinity.

S8-23

2(e) Recommendations. Due to the legal status of species documented to be present in the project area, DCR recommends coordination with the Virginia Department of Game and Inland Fisheries, the USFWS and the National Marine Fisheries Service for information regarding the possible impacts to these protected species and to ensure compliance with protected species legislation.

Contact DCR-DNH, Rene Hypes at (804) 371-2708 for an update on natural heritage information if a significant amount of time passes before the proposed activities are initiated since new and updated information is continually added to Biotics.

3. Air Pollution Control. According to the EA (page 3-82), within U.S. territory, emission increases mainly would be associated with increased engine operations of MH-60S helicopters, small boats, and range support craft. Outside U.S. territory, emission increases primarily would be associated with increased operations of surface vessels and fixed-wing aircraft. The document (page 3-83) finds that implementation of the action would not result in significant impacts to regional air quality and would not result in significant harm to the air quality of the global commons.

3(a) Agency Jurisdiction. DEQ's Air Quality Division, on behalf of the State Air Pollution Control Board, is responsible to develop regulations that become Virginia's Air Pollution Control Law. DEQ is charged to carry out mandates of the state law and related regulations as well as Virginia's federal obligations under the *Clean Air Act* as amended in 1990. The objective is to protect and enhance public health and quality of life through control and mitigation of air pollution. The division ensures the safety and quality of air in Virginia by monitoring and analyzing air quality data, regulating sources of air pollution, and working with local, state and federal agencies to plan and implement strategies to protect Virginia's air quality. The appropriate regional office is directly responsible for the issue of necessary permits to construct and operate all stationary sources in the region as well as to monitor emissions from these sources for compliance. As a part of this mandate, the environmental documents of new projects to be undertaken in the state are also reviewed. In the case of certain projects, additional evaluation and demonstration must be made under the general conformity provisions of state and federal law.

S8-24

3(b) Ozone Maintenance Area. According to the DEQ Air Division, the project area is partly located in an ozone (O_3) maintenance area and an emission control area for the contributors to ozone pollution, which are VOCs and NO_x. Therefore, the Navy should take all reasonable precautions to limit emissions of VOCs and NO_x, principally by controlling or limiting the burning of fossil fuels.

For further information, contact Kotur Narasimhan, DEQ at (804) 698-4415

4. Offshore Energy Resources.

4(a) Agency Jurisdiction.

Department of Mines, Minerals and Energy-Division of Mineral Resources. The mission of the Department of Mines, Minerals and Energy (DMME), Division of Mineral Resources (DMR) is to enhance the development and conservation of energy and mineral resources in a safe and environmentally sound manner to support a more productive economy in Virginia. Serving as Virginia's geological survey, DMME-DMR generates, collects, compiles, and evaluates geologic data, creates and publishes geologic maps and reports, works cooperatively with other state and federal agencies, and is the primary source of information on geology, mineral and energy resources, and geologic hazards for both the mineral and energy industries and the general public. DMME-DMR also provides the necessary geologic support for those divisions of DMME that regulate the permitting of new mineral and fuel extraction sites, miner safety, and land reclamation.

4(b) Agency Comments. DMME-DMR reviewed the DEIS/OEIS and submitted the following comments for the Navy's consideration:

S8-25
- The report should address proposed impacts on, or coexistence with, possible future infrastructure related to development of alternative energy sources such as wind, waves, and currents on the continental shelf, their associated power transportation lines, and their onshore support facilities.

S8-26
- The report should address the impact of increased activity in this range on the potential exploration and development of offshore mineral or oil and gas resources. Currently, the locations of sand, gravel and contained hard mineral resources are only partially known. The location of oil and gas resources, while suspected based on the geologic environment, are yet to be discovered.
- If permanent offshore structures are not being constructed and potential mineral and energy extraction sites can co-exist with planned training exercises, expanded training activities within the outlined area would have minimal impact on development of mineral or energy resources.

4(c)Coastal Energy Issues. The Virginia Coastal Energy Research Consortium (VCERC) was established by the Virginia Energy Plan of 2006. The VCERC was created to "serve as an interdisciplinary study, research, and information resource for the Commonwealth on coastal energy issues" with an initial focus on offshore winds, waves, and marine biomass. VCERC is charged with the following responsibilities:

- consult with the General Assembly, federal, state, and local agencies, nonprofit organizations, private industry and other potential users of coastal energy research;

- establish and administer agreements with other universities of the Commonwealth to carry out research projects relating to the feasibility of recovering fuel gases from methane hydrates and increasing the Commonwealth's reliance on other forms of coastal energy;
- disseminate new information and research results;
- apply for grants made available pursuant to federal legislation, including but not limited to research and development calls from the federal government and from other sources; and
- facilitate the application and transfer of new coastal energy technologies.

VCERC is governed by a board which consists of fourteen members, with representatives from eight partner universities and six government and industry partners. VCERC is located at Old Dominion University in Norfolk.

S8-27 **4(d) Recommendation.** The Virginia Institute of Marine Sciences (VIMS) recommends that the Final EIS include an assessment of potential impacts (and alternatives and mitigation measures) with regard to the activities of the Virginia Coastal Energy Research Consortium of which VIMS is a partner.

For additional information, contact Edward E. Erb, Ph.D., DMME at (434) 951-6350 and/or Pam Mason, VIMS at (804) 684-7158.

5. Historic Structures and Archaeological Resources. According to the DEIS/OEIS (page 3-346), thousands of submerged cultural resources, primarily shipwrecks, lie along the south Atlantic continental shelf. The document (page 3-354) states that planning and implementation of mitigation measures, including avoidance, would result in no significant adverse impacts (negligible to minor impacts) for shipwrecks in the Chesapeake Bay or the VACAPES Study Area (*no adverse effect* under Section 106).

5(a) Agency Jurisdiction. The Department of Historic Resources (DHR) conducts reviews of projects to determine their effect on historic structures or cultural resources under its jurisdiction. DHR, as the designated State's Historic Preservation Office, ensures that federal actions comply with Section 106 of the *National Historic Preservation Act of 1966* (*NHPA*), as amended, and its implementing regulation at 36 CFR Part 800. The *NHPA* requires federal agencies to consider the effects of federal activities on properties that are listed or eligible for listing on the National Register of Historic Places. Section 106 also applies if there are any federal involvements, such as licenses, permits, approvals or funding.

S8-28 **5(b) Agency Comments.** DHR requests that the Navy consult with DHR directly pursuant to Section 106 of the *NHPA* (as amended) and its implementing regulations codified at 36 CFR Part 800, which requires federal agencies to consider the effects of their undertakings on historic properties.

For additional information and coordination, contact Roger Kirchen, DHR at (804) 367-2323, ext. 153.

6. Local Comments. Accomack County supports the activities described in the DEIS/OEIS and has no objections.

Contact Steven Miner, Accomack County Administrator at (757) 787-5700 with any further questions.

7. Regional Planning Area.

7(a) Agency Jurisdiction. In accordance with the Code of Virginia, Section 15.2-4207, planning district commissions encourage and facilitate local government cooperation and state-local cooperation in addressing, on a regional basis, problems of greater than local significance. The cooperation resulting from this is intended to facilitate the recognition and analysis of regional opportunities and take account of regional influences in planning and implementing public policies and services. Planning district commissions promote the orderly and efficient development of the physical, social and economic elements of the districts by planning, and encouraging and assisting localities to plan, for the future.

7(b) Agency Comments. The staff of the Hampton Roads Planning District Commission (HRPDC) reviewed the consistency determination and contacted the City of Virginia Beach. According to HRPDC, the proposal is generally consistent with local and regional plans and policies. Furthermore, the City of Virginia Beach finds the document to be complete and sufficient, and offers no additional substantive comments (email attached).

For additional information contact Dwight Farmer, HRPDC at (757) 420-8300.

REGULATORY AND COORDINATION NEEDS

1. Federal Consistency. Pursuant to the *Coastal Zone Management Act of 1972*, as amended, the Navy is required to determine the consistency of its activities affecting Virginia's coastal resources or coastal uses with the Virginia Coastal Resources Management Program (VCP) (also called the Virginia Coastal Zone Management Program) (see section 307(c)(1) of the *Act* and 15 CFR Part 930, sub-part C, section 930.34). This involves an analysis of the activities in light of the Enforceable Policies of the VCP (see Attachment 1), and submission of a consistency determination reflecting that analysis and committing the Navy to comply with the Enforceable Policies. This determination may be provided as part of the documentation concluding the NEPA process, or independently, depending on your agency's preference. Section 930.39

gives content requirements for the consistency determination, or you may visit the DEQ Website at, http://www.deq.virginia.gov/eir/federal.html. We encourage the Navy to consider the Advisory Policies of the VCP (see Attachment 2).

2. Offshore Energy Resources. Coordination of this action with the Commonwealth's offshore energy research and development activities may be accomplished by contacting the Virginia Coastal Energy Research Consortium, Dr. Patrick Hatcher, Executive Director at (757) 683-4105.

3. Historic and Archaeological Resources. The Navy must coordinate this action with the Department of Historic Resources in accordance with Section 106 of the *National Historic Preservation Act*, as amended, and its implementing regulation 36 CFR 800. For additional information and coordination, contact Roger Kirchen, DHR at (804) 367-2323, ext. 153.

4. Protected Species. To ensure compliance with protected species legislation, the Navy should coordinate closely with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service and the Virginia Department of Game and Inland Fisheries.

Thank you for the opportunity to review the Draft Environmental Impact Statement/Overseas Environmental Impact Statement for the Virginia Capes Range Complex. Detailed comments of reviewing agencies are attached for your review. Please contact Ellie Irons at (804) 698-4325 or John Fisher at (804) 698-4339 for clarification of these comments.

Sincerely,

Ellie L. Irons, Program Manager
Office of Environmental Impact Review

Enclosures

cc: Michelle Hollis, DEQ-TRO
Paul Kohler, DEQ-ORP
Tony Watkinson, VMRC
Amy Ewing, DGIF
Matt Heller, DMME
Ethel Eaton, DHR
Pam Mason, VIMS
R.N. Rusty Harrington, DoAv
James Spore, City of Virginia Beach

Steven Miner, Accomack County
Katherine Nunez, Northampton County
Paul Berge, Accomack-Northampton PDC
Dwight Farmer, Hampton Roads PDC

Comment #S9

North Carolina
Department of Administration

Michael F. Easley, Governor

Britt Cobb, Secretary

August 8, 2008

Mr. J.M. Hinson
Dept. of the Navy, Atlantic Division
Naval Facilities Engineering Command
Attn: Code EV22ES
6506 Hampton Blvd.
Norfolk, VA 23508-1278

Re: SCH File # 08-E-0000-0393; DEIS; Enhancement to the Virginia Capes Range Complex necessary to maintain a state of military readiness. Study areas are: Delaware, Maryland, Virginia, & North Carolina. View project at http://www.vacapesrangecomplexeis.com

Dear Mr. Hinson:

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act. Attached to this letter for your consideration are the comments made by agencies in the course of this review.

If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

Should you have any questions, please do not hesitate to call.

Sincerely,

Valerie McMillan

Valerie W. McMillan, Director
State Environmental Policy Act

Attachments

Mailing Address:
1301 Mail Service Center
Raleigh, NC 27699-1301

Telephone: (919)807-2425
Fax (919)733-9571
State Courier #51-01-00
e-mail valerie.w.mcmillan@doa.nc.gov

Location Address:
116 West Jones Street
Raleigh, North Carolina

NCDENR

North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor

William G. Ross Jr., Secretary

Post-it® Fax Note 7671	Date 8/8/08	# of pages ▸ 3
To SHEILA GREEN	From KAREN CANAVACIOL	
Co./Dept.	Co.	
Phone #	Phone #	
Fax #	Fax #	

MEMORANDUM

TO: Valerie McMillan
State Clearinghouse

FROM: Melba McGee
Environmental Review Coordinator

The Department of Environment and Natural Resources has completed its review. Our regional office within the geographic area of the proposed projects has identified permits that may be required prior to project construction. For more information, the project applicant should notify the respective regional office marked on the back of the attached permit form.

Thank you for the opportunity to review.

Attachments

1601 Mail Service Center, Raleigh, North Carolina 27699-1601
Phone: 919-733-4984 \ FAX: 919-715-3060 \ Internet: www.enr.state.nc.us/ENR/

One North Carolina Naturally

State of North Carolina
Department of Environment and Natural Resources

Reviewing Office: Washington

INTERGOVERNMENTAL REVIEW - PROJECT COMMENTS

Project Number: 08-0393 Due Date:

After review of this project it has been determined that the ENR permit(s) and/or approvals indicated may need to be obtained in order for this project to comply with North Carolina Law. Questions regarding these permits should be addressed to the Regional Office indicated on the reverse of the form. All applications, information and guidelines relative to these plans and permits are available from the same Regional Office.

	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
☐	Permit to construct & operate wastewater treatment facilities, sewer system extensions & sewer systems not discharging into state surface waters.	Application 90 days before begin construction or award of construction contracts. On-site inspection. Post-application technical conference usual.	30 days (90 days)
☐	NPDES - permit to discharge into surface water and/or permit to operate and construct wastewater facilities discharging into state surface waters.	Application 180 days before begin activity. On-site inspection. Pre-application conference usual. Additionally, obtain permit to construct wastewater treatment facility-granted after NPDES. Reply time, 30 days after receipt of plans or issue of NPDES permit-whichever is later.	90-120 days (N/A)
☐	Water Use Permit	Pre-application technical conference usually necessary	30 days (N/A)
☐	Well Construction Permit	Complete application must be received and permit issued prior to the installation of a well.	7 days (15 days)
☐	Dredge and Fill Permit	Application copy must be served on each adjacent riparian property owner. On-site inspection. Pre-application conference usual. Filling may require Easement to Fill from N.C. Department of Administration and Federal Dredge and Fill Permit.	55 days (90 days)
☐	Permit to construct & operate Air Pollution Abatement facilities and/or Emission Sources as per 15 A NCAC (2Q.0100 thru 2Q.0300)	Application must be submitted and permit received prior to construction and operation of the source. If a permit is required in an area without local zoning, then there are additional requirements and timelines (2Q.0113).	90 days
☐	Permit to construct & operate Transportation Facility as per 15 A NCAC (2D.0800, 2Q.0601)	Application must be submitted at least 90 days prior to construction or modification of the source.	90 days
S9-1 ☑	Any open burning associated with subject proposal must be in compliance with 15 A NCAC 2D.1900	N/A	60 days (90 days)
S9-2 ☑	Demolition or renovations of structures containing asbestos material must be in compliance with 15 A NCAC 20.1110 (a) (1) which requires notification and removal prior to demolition. Contact Asbestos Control Group 919-707-5950.		
☐	Complex Source Permit required under 15 A NCAC 2D.0800		
S9-3 ☑	The Sedimentation Pollution Control Act of 1973 must be properly addressed for any land disturbing activity. An erosion & sedimentation control plan will be required if one or more acres to be disturbed. Plan filed with proper Regional Office (Land Quality Section) At least 30 days before beginning activity. A fee of $65 for the first acre or any part of an acre. An express review option is available with additional fees.		20 days (30 days)
☐	Sedimentation and erosion control must be addressed in accordance with NCDOT's approved program. Particular attention should be given to design and installation of appropriate perimeter sediment trapping devices as well as stable stormwater conveyances and outlets.		(30 days)
☐	Mining Permit	On-site inspection usual. Surety bond filed with ENR Bond amount varies with type mine and number of acres of affected land. Any acre mined greater than one acre must be permitted. The appropriate bond must be received before the permit can be issued.	30 days (60 days)
☐	North Carolina Burning permit	On-site inspection by N.C. Division Forest Resources if permit exceeds 4 days	1 day (N/A)
☐	Special Ground Clearance Burning Permit - 22 counties in coastal N.C. with organic soils	On-site inspection by N.C. Division Forest Resources required "if more than five acres of ground clearing activities are involved. Inspections should be requested at least ten days before actual burn is planned."	1 day (N/A)
☐	Oil Refining Facilities	N/A	90-120 days (N/A)
☐	Dam Safety Permit	If permit required, application 60 days before begin construction. Applicant must hire N.C. qualified engineer to: prepare plans, inspect construction, certify construction is according to ENR approved plans. May also require permit under mosquito control program. And a 404 permit from Corps of Engineers. An inspection of site is necessary to verify Hazard Classification. A minimum fee of $200.00 must accompany the application. An additional	30 days (60 days)

	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
☐	Permit to drill exploratory oil or gas well	File surety bond of $5,000 with ENR running to State of NC conditional that any well opened by drill operator shall, upon abandonment, be plugged according to ENR rules and regulations.	10 days N/A
☐	Geophysical Exploration Permit	Application filed with ENR at least 10 days prior to issue of permit. Application by letter. No standard application form.	10 days N/A
☐	State Lakes Construction Permit	Application fees based on structure size is charged. Must include descriptions & drawings of structure & proof of ownership of riparian property.	15-20 days N/A
S9-4 ☑	401 Water Quality Certification	N/A	60 days (130 days)
☐	CAMA Permit for MAJOR development	$250.00 fee must accompany application	55 days (150 days)
☐	CAMA Permit for MINOR development	$50.00 fee must accompany application	22 days (25 days)
☐	Several geodetic monuments are located in or near the project area. If any monument needs to be moved or destroyed, please notify: N.C. Geodetic Survey, Box 27687 Raleigh, NC 27611		
☐	Abandonment of any wells, if required must be in accordance with Title 15A. Subchapter 2C.0100.		
☐	Notification of the proper regional office is requested if "orphan" underground storage tanks (USTS) are discovered during any excavation operation.		
☐	Compliance with 15A NCAC 2H 1000 (Coastal Stormwater Rules) is required.		45 days (N/A)
S9-5 ☑	Tar Pamlico or Neuse Riparian Buffer Rules required.		

* Other comments (attach additional pages as necessary, being certain to cite comment authority)

REGIONAL OFFICES

Questions regarding these permits should be addressed to the Regional Office marked below.

☐ **Asheville Regional Office**
2090 US Highway 70
Swannanoa, NC 28778
(828) 296-4500

☐ **Fayetteville Regional Office**
225 North Green Street, Suite 714
Fayetteville, NC 28301-5043
(910) 433-3300

☐ **Mooresville Regional Office**
610 East Center Avenue, Suite 301
Mooresville, NC 28115
(704) 663-1699

☐ **Raleigh Regional Office**
3800 Barrett Drive, Suite 101
Raleigh, NC 27609
(919) 791-4200

☒ **Washington Regional Office**
943 Washington Square Mall
Washington, NC 27889
(252) 946-6481

☐ **Wilmington Regional Office**
127 Cardinal Drive Extension
Wilmington, NC 28405
(910) 796-7215

☐ **Winston-Salem Regional Office**
585 Waughtown Street
Winston-Salem, NC 27107
(336) 771-5000

NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW

RECEIVED
JUL 1, 2008
HISTORIC PRESERVATION OFFICE

STATE NUMBER: 08-E-0000-0393 H07
DATE RECEIVED: 06/30/2008
AGENCY RESPONSE: 07/25/2008
REVIEW CLOSED: 07/30/2008

MS RENEE GLEDHILL-EARLEY
CLEARINGHOUSE COORD
DEPT OF CUL RESOURCES
ARCHIVES-HISTORY BLDG - MSC 4617
RALEIGH NC

REVIEW DISTRIBUTION
CC&PS - DEM, NFIP
DENR LEGISLATIVE AFFAIRS
DEPT OF AGRICULTURE
DEPT OF CUL RESOURCES
DEPT OF TRANSPORTATION

CH08-1565
A- NC RWY 7-9-08
S- NC MSC 7/11/08
7-22-08

PROJECT INFORMATION
APPLICANT: Dept. of the Navy, Atlantic Division
TYPE: National Environmental Policy Act
ERD: Draft Environmental Impact Statement
DESC: Enhancement to the Virginia Capes Range Complex necessary to maintain a state of military readiness. Study areas are: Delaware, Maryland, Virginia, & North Carolina. View project at http://www.vacapesrangecomplexeis.com

The attached project has been submitted to the N. C. State Clearinghouse for intergovernmental review. Please review and submit your response by the above indicated date to 1301 Mail Service Center, Raleigh NC 27699-1301.
If additional review time is needed, please contact this office at (919)807-2425.

AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED:

[X] NO COMMENT

[ ] COMMENTS ATTACHED

SIGNED BY: Renee Gledhill-Earley by MPM

DATE: 7/15/2008

JUL 2008 RECEIVED Secretary's Office DOA

JUL 03 2008

Comment #O1

Fisher,John

From: Pam Mason
Sent: Friday, July 25, 2008 1:09 PM
To: Fisher,John

John:

O1-1

Thanks for the opportunity to provide comments on the Virginia Capes Range Complex EIS. VIMS has also gotten requests for comment directly from the Navy and will reply to those requests. Generally, Issues concering biotic and abiotic marine resources appear to be adequately considered and addressed. I do not see any information provided with regard to the assessment of potential impacts (and alternatives and mitgiative measures as necessary) on the efforts of the Virginia Coastal Energy Research Consortium of which VIMS is a partner.

Pam Mason

Pam Mason
Scientist
Center for Coastal Resources Management
Virginia Institute of Marine Science
PO Box 1346
Gloucester Pt, VA 23062

Comment #O2

ASSOCIATION OF MARYLAND PILOTS

3720 DILLON STREET □ BALTIMORE, MARYLAND 21224-5239 □ (410) 276-1337 □ FAX: (410) 276-1364
PRESIDENT'S FAX: (410) 276-4197 □ CABLE: MARPILOT BALTIMORE □ TELEX: 87-574

August 11, 2008

Department of the Navy
Commander
Naval Facilities Engineering Command, Atlantic
Code EV22ES (VACAPES EIS/OEIS PM)
6506 Hampton Boulevard
Norfolk, VA 23508-1278

Re: Virginia Capes Range Complex
Response for Request for Comments on the DEIS/OEIS

Sent by Mail and Fax to (757) 322-4894

Dear Sir;

I have reviewed the VACAPES Range Complex Draft EIS/OEIS and would like to make the following comments:

The Association of Maryland Pilots represents pilots who provide service to all foreign-flagged commercial ship traffic entering the Chesapeake Bay bound for Maryland ports. Our members handle 5000 vessel movements per year. Our Association is one of two pilot groups with a presence at Cape Henry, the other being the Virginia Pilot Association. They handle all commercial ocean-going vessels bound for ports in Virginia. I do not have figures for their traffic volume, but presumably, it is similar to ours, numbering in the thousands per year. Based upon this fact, I was surprised that neither they nor we were on your distribution list for solicitation for comments for this EIS. It was only through the courtesy of the Maryland Environmental Service that we were notified about a change in Naval Operations with such a large potential impact upon the commercial interests of the states of Maryland and Virginia. I received notification of this project only last week, so I feel a little pressed to comment by today's deadline.

O2-1

Your draft report, on page 3-356, notes that " The east coast of the United States is heavily traveled by marine vessels, with several commercial ports occurring near Navy OPAREAs. The inshore areas of the VACAPES OPAREA are particularly heavily traveled…".
Also, on page 3-358, the report notes "The Lower Chesapeake Bay is home to the Port of Virginia, the third-busiest port facility on the East Coast". The report notes on the same

page that ships calling on the Port of Baltimore enter at Cape Henry and must transit the Chesapeake Channel, which leads to points north.
On page 6-4, the report notes "The VACAPES OPAREA is in the direct path of commercial shipping traffic traveling between the two major ports along the northeastern seaboard, New York and Boston, and Miami and other ports in the south".

O2-2 Our concern with the proposed increase in naval operations in the VACAPES OPAREA is the potential for disruption to the schedules of the ships calling upon the ports on the Chesapeake Bay. Operating costs associated with these vessels are huge and the competitive positions of the various east coast ports and the shipping companies that serve them are so dynamic that any factor which alters the market must be closely analyzed. Vessels must consider the time that it takes to reach a port, including potential delays introduced by prevailing weather, fuel costs and hazards specific to a port. Terminal operators must be able to schedule arrivals and produce a quick turnaround to the vessels they serve in order to be competitive.

O2-3 The draft report does not make clear to us how ship traffic will be affected, other than non-specific assurances that "Implementation of the proposed action would not produce any significant regional transportation impacts. Impacts on commercial and recreational transportation would be short-term in nature and produce some temporary access limitation" (6.4.13.1).

O2-4 We would respectfully request that the Association of Maryland Pilots have an opportunity to speak with the Command in order to thoughtfully address the intended protocol for resolving conflicts between the Navy's need for additional training days in the OPAREA and the long-standing commercial traffic patterns developed by vessels calling at ports on the Chesapeake Bay.

Thank you for the opportunity to address our concerns about this proposal. I may be contacted at (410) 276-1337 x225 or by email at jhamill@mdpilots.com.

Sincerely,

John P. Hamill

Captain John P. Hamill
1st Vice President
Association of Maryland Pilots

We'll now hear from Mr. John B. Stewart. Mr. Stewart.

MR. STEWART: Hello. I live at Ocean View, Delaware. My only real concern is -- I really like the presentation, and everything is pretty straightforward.

The only thing I don't see many comments on is this low frequency sonar. I would like to see some data on what's being done. From what I've read and what I've heard, it's very dangerous to the mammals. And I would like to know what the Navy depends -- what they decide that they're going to do with that kind of sonar. That's my only concern. I would like that to be considered, and maybe a little bit more information on that in the next presentation. Thank you.

JUDGE MAKSYM: Thank you, Mr. Stewart. I appreciate it.

We'll hear from Mr. Clark of Delaware. Mr. Clark.

Comment #O3 MR. CLARK: My name is Eric Clark. I'm in the Merchant Marines. We bring lots of oil to the East Coast daily, yearly. We do a lot of ship-to-ship live ring operations bringing crude oil into the U.S.

Speaking with Commander Beckley, it was -- the amount of time that we might be given to know when an operation is going to take place, notice of mariners publications, possibly could be short when communicating that to the international U.S. -- international tankers coming into the U.S. Obviously, if there's guns being fired and missiles, bombs, torpedoes, those are a real concern for our operation.

We typically work between 30 and 50 miles offshore, and we move into the Delaware Bay sector near 700,000 barrels a day. I would ask for -- you stated possibly it was a minimum of three days' notification prior to the commencement of an operation. From the commercial side, I think that's too short for us to respond adequately. Obviously, on radios we listen and we maneuver accordingly, but for planning, the scope is much larger when you bring that much crude into the U.S. if you have to deviate from areas of water which you typically work for swell reasons, right whales, things that are happening offshore, cap -- port zones.

O3-1 Again, my comment being, the notice of mariners, if the time could be lengthier than the minimum with regards to the northern areas being

nominated, Delaware Bay being the second largest oil port in the U.S. Thank you.

JUDGE MAKSYM: Thank you ever so much, Mr. Clark. And again, thank you for your service to the greatest Merchant Marine in the world.

Any other questions or comments that anyone would like to place on the record at this time?

All right. Going once, going twice, but really not gone because what we're going to do is, I simply am going to hold the hearing into a degree of abeyance for 20 minutes and put us in a state of recess. If during that period of time anyone has additional comments they would like to make, they just have to fill out a card. The staff here will collect those records. We'll come back up to home plate at 20 minutes from now, and we'll hear the comments of our fellow citizens that will have been -- we have a nominee. So we're going to hold off to my much vaunted recess for just a moment.

When I really do -- I have to pony in this -- in the pokey, as it were, right here. I know about as much about this as you do. I reviewed it for the first time today. I met all these gentlemen for the first time today. So I really do

you're looking towards protecting our whales, again, I am with Mr. James, the right whale does concern me.

The idea that you're implementing all these things with your science and with your research, the only thing I'm going to say is I hope the Navy continues with the very thorough way that you're doing with this operation because I think that is what's going to help us in the future.

And I thank you for allowing me to express my feelings. And I am a little afraid.

COMMANDER BOOKER: Thank you, Ms. Mosher. Ms. Barco.

Comment #O4 MS. BARCO: Thank you. I'm Susan Barco, and S-U-S-A-N B-A-R-C-O. I live in Virginia Beach and I'm representing the Virginia Aquarium and Marine Science Center.

I would also like to say that I'm very impressed with the amount of work that the Navy and its contractors have put into this EIS process, this one and others that I've seen recently.

And I hope that they continue and continue to improve this process because I do think there's still some areas that all of us need to work on, not just the Navy but the science community as well.

O4-1 The things that I am most concerned

about are the Navy's vessels make up a fairly significant percentage of the large vessel traffic, particularly, fast vessel traffic that moves in and out of the Chesapeake Bay, and I encourage the Navy to consider the trend of those vessels to and from training exercises and their impact and their mitigation measures because I am not convinced that that is being considered as much as it should.

The Navy vessels are very high-speed vessels, they're relatively large and an observer is not going to have enough time to really make a difference in how it should move if the ship is moving at 20 knots or more. So the best observers in the world really can't help you a lot if you don't have any distance to play with in avoiding a whale collision.

O4-2 I'm also still concerned that the densities the Navy are using for determining impacts and determining times of the year when it would be of the least impact to schedule these trainings is still lacking data, and that's not the Navy's fault, that's the fault of all of us who have not been able to survey this area, the VACAPES area very well.

But I do think that that's an area where we should consider -- the Navy should consider default minimal densities for different species in

different times of the year when their survey data is lacking.

Because it seems in some of the density documents that I've read, that a lack of data has been treated as no animals in the area, not that no one has looked in that area. And it's very important that the Navy continue to both support survey efforts and to incorporate that data into their density documents and I hope that will continue to be the case.

O4-3 Finally, I'm concerned, that the posted observers on the vessels that, while important, are not going to be as effective as the Navy implied.

Certainly, if you have perfect sighting conditions and your vessel is going at six or eight knots and you have plenty of people posted and you have immediate communications to the ship's bridge to change behavior as you see it, et cetera, that's great, but those perfect conditions do not exist at most times, even when you're actually trying to conduct a survey.

And so while I applaud the visually-based mitigation measures, I certainly don't think they should be relied on solely in any cases and they should only, if possible, be accompanied by other measures such as acoustic monitoring and things like that.

So I think that visual-based monitoring is important but it does have its drawbacks and I wanted to make sure you knew that. Thank you for letting me speak and continue the good work.

COMMANDER BOOKER: Thank you, Ms. Barco.

Is there anyone else who would like to make any comments at the moment? Apparently not.

What I propose to do then is we will recess until about 8 p.m. At 8 p.m. we'll reconvene and see whether anyone at that point has any comments to make and we will take things from there.

Is there any objection to my recessing until 8 p.m.? It's a negative response. We're in recess. Carry on.

(Recess taken from 7:35 to 8 p.m.)

COMMANDER BOOKER: Ladies and Gentlemen, it's 8 p.m., is there anybody who has any further comments with respect to the environmental impact statement? Apparently not.

Any objection to my recessing until 8:45? Apparently not. We're in recess. Carry on.

VACAPES Range Complex
DEIS/OEIS Comments

Name: Ron Gladkowski

Organization: Charter Fishing Captain

Comment #: P1

Date: July 14, 2008

Comment: I attended the meeting in Ocean City on July 14th. I believe the testing has to be done to keep our military trained. I also believe it should not interfear with me making a living. There are several items

P1-1 I would like to be concidered. The first are dates of fishiong tournaments, the second is that almost all the tournament held from New Jersey to the Carolinas have fishing limits of 100 miles off the coast. Why cant all testing be done outside this area, it is the simplest solution to solve everyones concerns. The last item is to do the testing in the winter months when no one is fishing. Sincerely Ron Gladkowski

VACAPES Range Complex
DEIS/OEIS Comments

Name: Sharon Stewart

Organization:

Comment #: P2

Date: August 04, 2008

Comment: P2-1 I am a marine mammal lover and advocate and am appalled at the mortality rate, physiological effect and behavioral responses the Navy considers acceptable. You will be interfering with the whale, dolphin and turtle lives many miles from your testing zone. Of the 3 alternatives, #2 is the least offensive and natural pick which I'm sure you led us to believe. It is still death and harm to so many creatures that I can't believe you wouldn't come up with an alternative. I realize the troops have to be prepared to fight the enemy but at what cost?? We cannot continue to destroy the planet and the species who don't have a voice. Helping the marine mammals may just save the human race in the long run. The death and destruction of our race will probably come from ourselves and not some terrorist organization. Please think long and hard before making this decision. Thank you.

VACAPES Range Complex
DEIS/OEIS Comments

Name: Joan Kean

Organization:

Comment #: P3

Date: August 08, 2008

Comment: P3-1

I attended the public hearing held in Chincoteague on July 15th. My concerns in all such endeavors are 1) that environmental factors be evaluated and proper protections be in place and 2) that the economic factors be adequately considered for the locations affected. These concerns are particularly high for a sensitive region such as the Eastern Shore of Va. that is dependant on its natural resources for tourism, aquaculture and our remaining working watermen. Also, there is always the question of economic justice as it is often easy to overlook the concerns of a rural area as opposed to a dominant urban or organized area such as VA. Beach or Hatteras where you are more likely to have organizational and citizen oversight. 3) Finally, I had some concerns that there could be competition among varying interests such as NASA, and any commercial "spaceport" that may evolve or similar endeavor.
The presentation at Chincoteague was originally limited to a few formal summaries by the team present. However, their willingness to discuss all poster displays and answer any questions was very helpful and demonstrated that most concerns had been taken into account. The Chincoteague area has a long standing and good relationship with the Navy and this could only be reenforced by the decision to hold this meeting here. Unfortunately, few people took advantage of the opportunity. As long as my original concerns continue to be taken into consideration, I believe the plan put forth can be readily supported by all interests.

VACAPES Range Complex
DEIS/OEIS Comments

Name: Claudia Alesi

Organization:

Comment #: P4

Date: August 11, 2008

Comment:

P4-1 I would like to state that I am against this. At the meeting held in O.C., MD, I was told that the testing,
which would include explosives, would not be detrimental to marine mammals & sea turtles. If this is so, then why did a Federal Judge in Hawaii forbid the U.S. Navy from proceeding with plans to use high intensity, mid-frequency sonar in the Hawaiian waters? A suit was filed by Earth Justice for the Center in February and they won. They stated how dolphins and whales use their finely tuned hearing for survival. The sonar blasts can result in serious and/or fatal injuries to marine mammals.

P4-2 The Navy acknowledged that its sonar might be detrimental to whales. I found it inconceivable that the Navy at that time ignored the Marine Mammal Protection Act and refused to prepare an environmental impact statement. There is an unbelievable amount of information regarding this subject. I read the "Bahamas Journal of Science". It stated that in the case of the March, 2000 strandings in the Bahamas, the U.S. Navy reported that there were coincidental naval activities involving an east-to-west transit of U.S. and foreign warships, when and where whales stranded. Several transiting warships were operating standard hull mounted tactical sonar. The U.S. Navy admitted this after five weeks of well publicized denial. I read much information from "The International Ocean Noise Coalition". They have documentation and scientific papers regarding strandings and ocean noise pollution. The Pacific Whale Foundation also has much documenation.

P4-3 There is an overwhelming evidence against sonar and navy explosives. I thank each and every person in the Navy and applaud the U.S. Navy for keeping our country safe. At the same time, with all of our technology, I would think that there would be better ways without harming marine mammals and sea turtles in their natural habitat. I realize that the Navy has to train incoming recruits, but isn't there any other way? Again, thank you and thank you for your time.

Comment #P5

Written comments become part of the public record associated with this proposed action. Accordingly, the Navy makes these comments, including names and home addresses of respondents, available for public review. Individual respondents may request that their name and/or home addresses be withheld from public disclosure, which will be honored to the extent allowable by law. If you wish to have your name and/or home address withheld, you must check the box(es) below. All submissions from organizations or businesses, and from individuals or officials representing organizations or businesses, will be made available for public inspection in their entirety.

☒ Please withhold my name from the public record to the extent allowable by law.

☐ Please withhold my address from the public record to the extent allowable by law.

United States Navy
Public Hearing Comment Form
VACAPES Range Complex
Environmental Impact Statement / Overseas Environmental Impact Statement

The U.S. Navy has prepared a Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) for the Virginia Capes (VACAPES) Range Complex. Please record your comments on the Draft EIS/OEIS on this form. You may submit your comments by:

1) Depositing this form at the Public Comment Collection station before you leave tonight
2) Submitting your comments via the project Web site at **www.vacapesrangecomplexeis.com**
3) Faxing this form to (757) 322-4894; Attention: Code EV22ES (VACAPES EIS/OEIS PM)
4) Mailing this form to:

Naval Facilities Engineering Command Atlantic
Attention: Code EV22ES (VACAPES EIS/OEIS PM)
6506 Hampton Blvd
Norfolk, VA 23508-1278

☐ *Please check the box if you would like to receive a CD Rom copy of the Final EIS/OEIS. Provide your mailing address below.*

All comments must be received no later than August 11, 2008.

Name: Lauren Hersemann Date: 7/16/08

Organization/Affiliation: _____

Address:* _____

City, State, Zip Code: _____

Comments: I applaud the Navy's involvement in marine mammal + marine organism research. However, because of its involvement in that research, the Navy should know that simply having 'spotters' aboard a vessel is insufficient. What about whales, such as braked whales, who spend up to 80% of their time at depth? A lookout will not do any good in that situation.

P5-1

(Use reverse side for additional comment)

Visit **www.vacapesrangecomplexeis.com** for project information.

*Provide your mailing address to receive future notices about the VACAPES Range Complex EIS/OEIS.

Comment #P6

faxZERO

Send a fax for free

Recipient Information

Name: t. cruz
Company: nafec vcapes
Fax #: 7573224894

Sender Information

Name: jeanpublic
Email address: jeanpublic@yahoo.com

Rec'd 6/27/08

re navy bombing the heck out of the ocean so that the ecology is damaged beyond repair and human health is impacted. the navy has no environmental interest at all and is a dangerouis destructive force. their training should be done in afghanistan or iraq, both bombed out regions, not bombing up any site in america.
i oppose this plan. i cannot attend this meeting. i also want to complain that you dont put e mail connections in your proposal notices - havent you realized its 2008 yet?
jeanpublic 15 elm st flohram park nj 07932
Federal Register: June 27, 2008 (Volume 73, Number 125)]
[Notices]
[Page 36498-36500]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr27jn08-39]

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Public Hearings for the Virginia Capes Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: Pursuant to section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] 4321); the Council of Environmental Quality (CEQ) Regulations for implementing the procedural provisions of NEPA (Title 40 Code of Federal Regulations [CFR] 1500-1508); Department of the Navy Procedures for Implementing NEPA (32 CFR 775); Executive Order (EO) 12114, Environmental Effects Abroad of Major Federal Actions; and Department of Defense (DoD) regulations implementing EO 12114 (32 CFR 187) the Department of the Navy (Navy) has prepared and filed with the U.S. Environmental Protection Agency a Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) on June 16, 2008. The National Marine Fisheries Service (NMFS) is a Cooperating Agency for the EIS/OEIS.

The EIS/OEIS evaluates the potential environmental impacts over a 10-year planning horizon associated with Navy Atlantic Fleet training; research, development, testing, and evaluation (RDT&E) activities; and associated range capabilities enhancements (including infrastructure improvements) within the existing Virginia Capes (VACAPES) Range Complex Operating Area (OPAREA). The components of the VACAPES Range Complex include 28,672 square nautical miles (nm2) of special use area (SUA) warning area; 27,661 nm2 of offshore surface and subsurface OPAREA; and 18,092 nm2 of deep ocean area greater than 100 fathoms (600 feet).

The geographic scope of the EIS/OEIS includes the airspace, seaspace, and undersea space of the VACAPES Range Complex. This area is referred to as the VACAPES Study Area. The VACAPES Study Area does not include any dry land. However, it does include the area from the mean high tide line east (seaward) to the 3nm boundary of the states of Delaware, Maryland, Virginia, and North Carolina. This 3-nm state boundary also serves as the western boundary of the VACAPES OPAREA. The VACAPES Study Area also includes 420 nm2 of the lower Chesapeake Bay. A Notice of Intent (NOI) for the EIS/OEIS was published in the Federal Register on December 8, 2006 (Federal Register Volume 71, No. 236, pp 71143-71145). A revised NOI was issued in the Federal Register (Volume 72, No. 171, pp 50940-50941) on September 5, 2007 when training areas in the southern Chesapeake Bay were identified for analysis.

The Navy will conduct four public hearings to receive oral and written comments on the Draft EIS/OEIS. Federal agencies, state agencies, and local agencies and interested individuals are invited to be present or represented at the public hearings. This notice announces the dates and locations of the public hearings for this Draft EIS/OEIS.

An open house session will precede the scheduled public hearing at each of the locations listed below and will allow individuals to review the information presented in the VACAPES Range Complex Draft EIS/OEIS. Navy representatives will be available during the open house sessions to clarify information related to the Draft EIS/OEIS.

Dates and Addresses: All meetings will start with an open house session from 5 p.m. to 7 p.m. A formal presentation and public comment period will be held from 7 p.m. to 9 p.m. Public hearings will be held on the following dates and at the following locations: July 14, 2008 at the Princess Royale Oceanfront Hotel, 9100 Coastal Hwy., Ocean City, MD; July 15, 2008 at the Chincoteague Center, 6155 Community Dr., Chincoteague, VA; July 16, 2008 at the Virginia Beach Resort & Conference Ctr., 2800 Shore Dr., Virginia Beach, VA; and July 17, 2008 at the Hilton Garden Inn, 5353 N. Va. Dare Trail, Kitty Hawk, NC.

FOR FURTHER INFORMATION CONTACT: Naval Facilities Engineering Command, Atlantic, Attention: EV22ES (VACAPES EIS/OEIS PM), 6506 Hampton Boulevard, Norfolk, Virginia 23508-1278; facsimile: 757-322-4894 or http://www.vacapesrangecomplexeis.com.

SUPPLEMENTARY INFORMATION: The Navy has identified the need to support and conduct current and emerging training and RDT&E operations in the VACAPES Range Complex. The proposed action does not indicate major changes to VACAPES Range Complex facilities, operations, training, or RDT&E capacities over the 10-year planning period. Rather, the proposed action would result in relatively small-scale but critical enhancements to the VACAPES Range Complex that are necessary if the Navy is to maintain a state of military readiness commensurate with its national defense mission.

The EIS/OEIS addresses the training strategies described in the Fleet Readiness Training Plan (FRTP) that implement the Fleet Response Plan, which ensures continuous availability of agile, flexible, trained, and ready surge-capable (rapid response) forces. The recommended range enhancements that have the potential

a speaker's card, and then we'll, of course, give you the floor. We'll provide you with one of those.

Any other speaker cards that have been prepared so I could summons someone at this time?

For everyone's edification, in the National Register -- Federal Register listed the commentary period as running two hours. That's what it's going to run, you see. Now --

Thank you. Mr. McClure from Delaware.

P7-1 MR. McCLURE: Hi. My name is Tom McClure, as I said. I don't have any research other than what I heard that -- and what I've done is, I know -- let's see, four years ago there were a lot of tuna and other highly migratory species off of Ocean City and Indian River.

On the radio I heard them say not to be in these areas because there's Navy live fire going on. And it must have been within 15 miles of, say, an area known as the Hot Dog for me to hear it on my radio. So it's probably more than just the Norfolk Canyon or the Washington Canyon.

But each year since four years ago, the tuna population seems to have gone down. This year I didn't hear of any Navy live fire, and the tuna fishing seems to be better, as well as other

migratory species.

I didn't get a chance to talk to your environmentalist to say that that doesn't matter, but I would just like to give you my personal experience that it seemed to matter from what I've seen and heard on the radio. And I really think that the fire, the acoustics can cause the fish to take different routes to migrate. You know, just because whales can hear a hundred miles or hundreds of miles doesn't mean it can bother tuna or other migratory species, but it might.

You know, that's mostly what I have to say.

As I was sitting here, I was in the Air Force, they used to bomb the land, you know, which I would think the Navy could also bomb the land and get your accuracy unless you're trying to bomb -- see what the effect is on other vessels, and I guess you need it on the water. Maybe some of your fire for accuracy can be done on the land and not bother the fish. That's basically it.

JUDGE MAKSYM: Thank you, sir. Thank you, Mr. McClure, for your comments. And on a private note, thank you for your service in the Air Force.

We'll now hear from Mr. John B. Stewart. Mr. Stewart.

MR. STEWART: Hello. I live at Ocean View, Delaware. My only real concern is -- I really like the presentation, and everything is pretty straightforward.

P8-1 The only thing I don't see many comments on is this low frequency sonar. I would like to see some data on what's being done. From what I've read and what I've heard, it's very dangerous to the mammals. And I would like to know what the Navy depends -- what they decide that they're going to do with that kind of sonar. That's my only concern. I would like that to be considered, and maybe a little bit more information on that in the next presentation. Thank you.

JUDGE MAKSYM: Thank you, Mr. Stewart. I appreciate it.

We'll hear from Mr. Clark of Delaware. Mr. Clark.

O3-1 MR. CLARK: My name is Eric Clark. I'm in the Merchant Marines. We bring lots of oil to the East Coast daily, yearly. We do a lot of ship-to-ship live ring operations bringing crude oil into the U.S.

Speaking with Commander Beckley, it was -- the amount of time that we might be given to know when an operation is going to take place, notice of mariners publications, possibly could be short when communicating that to the international U.S. -- international tankers coming into the U.S. Obviously, if there's guns being fired and missiles, bombs, torpedoes, those are a real concern for our operation.

We typically work between 30 and 50 miles offshore, and we move into the Delaware Bay sector near 700,000 barrels a day. I would ask for -- you stated possibly it was a minimum of three days' notification prior to the commencement of an operation. From the commercial side, I think that's too short for us to respond adequately. Obviously, on radios we listen and we maneuver accordingly, but for planning, the scope is much larger when you bring that much crude into the U.S. if you have to deviate from areas of water which you typically work for swell reasons, right whales, things that are happening offshore, cap -- port zones.

Again, my comment being, the notice of mariners, if the time could be lengthier than the minimum with regards to the northern areas being

nominated, Delaware Bay being the second largest oil port in the U.S. Thank you.

JUDGE MAKSYM: Thank you ever so much, Mr. Clark. And again, thank you for your service to the greatest Merchant Marine in the world.

Any other questions or comments that anyone would like to place on the record at this time?

All right. Going once, going twice, but really not gone because what we're going to do is, I simply am going to hold the hearing into a degree of abeyance for 20 minutes and put us in a state of recess. If during that period of time anyone has additional comments they would like to make, they just have to fill out a card. The staff here will collect those records. We'll come back up to home plate at 20 minutes from now, and we'll hear the comments of our fellow citizens that will have been -- we have a nominee. So we're going to hold off to my much vaunted recess for just a moment.

When I really do -- I have to pony in this -- in the pokey, as it were, right here. I know about as much about this as you do. I reviewed it for the first time today. I met all these gentlemen for the first time today. So I really do

the distribution of the Final EIS/OEIS. This decision will be summarized and published as a record decision in the Federal Register in April 2009. Thank you.

COMMANDER BOOKER: Thank you, Mr. Noble, Commander Beckley. We're now moving to the comments phase.

Mr. James, you may take the podium.

Comment #P9

MR. JAMES: Thank you, Commander Booker. My name is Ellis W. James. And I reside at 2021 Kenlake Place. That's all one word, K-E-N-L-A-K-E Place, Norfolk, Virginia. Zip is 23518-5305.

First, let me indicate strongly that those of us who are concerned about the environment and appear before you, also support our troops in our efforts to protect our Nation. And being a resident of Norfolk all my life, I'm very familiar with the Navy and its role.

There are compliments that should be made to the Navy at this point. I am very, very encouraged and pleased to see the extent to which the Navy and advisors have provided the kind of total assessment of what we're confronted with, especially with respect to your plans.

P9-1

There are some areas of concern, of course. The suggestion and proposal of 50 percent

increase of the helicopter flights raises questions about the impact on those who are fishing for a living in the Bay and what those extra flights might suggest or portend for them. I think that's an area we need to take a good look at.

P9-2 The area of great concern to me personally is the question of how we can effectively address the right whale corridor. That has to do with something that I read in your literature, which is the watchstanders' role in this whole process.

That, of course, from a practical standpoint, raises the question of how many watchstanders do we have per vessel depending upon whether it's a task force or an individual vessel, but their numbers would be extremely important.

If we're talking about on a vessel, two on the bow, one on the stern during an operation, you could see that the numbers of nine to 12 would be very significant from a standpoint of availability and their ability to do their job.

P9-3 There is that complicated area in all of this that deals with sonar and the question of sound as it relates to explosives. I am delighted to see that you are pulling back from the numbers of bombs to be detonated or ordnance to be detonated. I think that's a

plus.

And I think until we can, from a scientific standpoint, pin down the impact and the potential for harm when we conduct these training exercises, we have that very complicated aspect to density of layers of water, cold water, warm water, all of those issues that you're so familiar with.

And it strikes me that certainly we would be in a position, a much better position, if we can really hone in on the question of what's the usages of different sonars, whether we're talking about high frequency, mid-range or whatever, and those are the areas that I personally have a great concern.

I also talked with a number of people about those issues and they share those concerns too. Thank you very much.

COMMANDER BOOKER: Thank you, Mr. James. Ms. Mosher.

MS. MOSHER: Thank you, Commander, and everyone that's in this room that has contributed, to my knowledge, of what we're dealing with right now.

My name is Debora, that's D-E-B-O-R-A, Mosher, M-O-S-H-E-R and I live in Norfolk, Virginia -- for many years. My husband was in the Navy. I love the Navy. I visited Annapolis and saw how they're trained up

Comment #P10

plus.

And I think until we can, from a scientific standpoint, pin down the impact and the potential for harm when we conduct these training exercises, we have that very complicated aspect to density of layers of water, cold water, warm water, all of those issues that you're so familiar with.

And it strikes me that certainly we would be in a position, a much better position, if we can really hone in on the question of what's the usages of different sonars, whether we're talking about high frequency, mid-range or whatever, and those are the areas that I personally have a great concern.

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COMMANDER BOOKER: Thank you, Mr. James. Ms. Mosher.

P10-1

MS. MOSHER: Thank you, Commander, and everyone that's in this room that has contributed, to my knowledge, of what we're dealing with right now.

My name is Debora, that's D-E-B-O-R-A, Mosher, M-O-S-H-E-R and I live in Norfolk, Virginia -- for many years. My husband was in the Navy. I love the Navy. I visited Annapolis and saw how they're trained up

there. I have seen what the Navy has done for our community and I'm 100 percent behind it.

But I was shocked when I opened up the newspaper Sunday and I read the headlines and underneath the headlines, I said I have come to this meeting tonight to express my feelings.

I couldn't believe that you are reducing the number of live bombs from 450 to 20. I was so thrilled, I just shook my husband and said, Look what the Navy is doing. And as I continued to read the article, I am thrilled at what you're doing with this impact statement.

I realize that we have to have Fleet readiness and I can see how you're trying to adequately answer all the questions that what you're doing impacts our environment.

Again, I'm not going to spend much time. I want to say that you have definitely -- when I look over the list of the Federal environmental regulations and the other people that you have involved, is very impressive. I totally agree that your alternative is a preferred one. I wouldn't even see where there would be any questions.

And when I heard from the people here tonight about your latest science of technology that

you're looking towards protecting our whales, again, I am with Mr. James, the right whale does concern me.

The idea that you're implementing all these things with your science and with your research, the only thing I'm going to say is I hope the Navy continues with the very thorough way that you're doing with this operation because I think that is what's going to help us in the future.

And I thank you for allowing me to express my feelings. And I am a little afraid.

COMMANDER BOOKER: Thank you, Ms. Mosher. Ms. Barco.

MS. BARCO: Thank you. I'm Susan Barco, and S-U-S-A-N B-A-R-C-O. I live in Virginia Beach and I'm representing the Virginia Aquarium and Marine Science Center.

I would also like to say that I'm very impressed with the amount of work that the Navy and its contractors have put into this EIS process, this one and others that I've seen recently.

And I hope that they continue and continue to improve this process because I do think there's still some areas that all of us need to work on, not just the Navy but the science community as well.

The things that I am most concerned

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Comment No.	Agency or Public Comment	Navy Response
F1- USDI/Minerals Management Service		
F1-1	Re: Section 6.2.3.2 Concern for the fifty lease blocks, identified as Currituck Sound south of the Chesapeake Lighthouse, nominated for alternative energy technology testing.	The Navy revised the Cumulative Impacts chapter. See Section 6.3
F1-2	Re: Section 6.4.4.2 Concern that high quality sand at Sand Bridge Shoal used by City of Virginia Beach and the Navy for beach nourishment projects may be altered by Navy activities. Concern also for future sites at Cape Henry and False Cape.	The Navy revised Section 3.1 regarding proposed actions potentially impacting areas in the Study Area used or planned for beach nourishment. See Section 3.1
F1-3	Re: Section 6.4.4.2 Concern for sand resources used or planned for use for beach nourishment projects. Sites include: Great Gull Bank and shoals off Eastern Shore, offshore of Delaware including Hen and Chickens Shoal, mouth of the Delaware Bay and Cape may, NJ, and several sites off Dare County NC.	The Navy revised Section 3.1 regarding proposed actions potentially impacting areas in the Study Area used or planned for beach nourishment. See Section 3.1
F2- US Environmental Protection Agency		
F2-1	Re: page 2-19 Provide more details on the expendable, inert, bottom and moored mine shapes. Length of time left in place; disposition for shapes used in AMNS and RAMICS.	The Navy provided more detail regarding non-explosive training mines in Chapter 2. Non-explosive training mines could stay in place for up to six months at a time. Following a mine neutralization operation, divers gather expended mine shapes (as practicable) in order to assess training success.
F2-2	Re: page 2-20 Not clear if there is an impact to environmental receptors from OASIS and AN/AQS-20 acoustics and sonar.	The Navy evaluated the environmental impacts of OASIS (DoN, 2005) and AN/AQS-20 (DoN, 2003) and this information was added to the text in Section 2.2.4.3 for clarity.
F2-3	Re: page 2-24 Clearly state why Instrumented Training Area South must be in the Chesapeake Bay.	The Navy added information to Section 2.2.5 to clarify the need for instrumented training areas in the lower Chesapeake Bay.
F2-4	Re: Table 2.2-4 Clearly show which MIW training areas would be done in the Lower Chesapeake Bay	Table 2.2-4, far right column clearly identifies which MIW training occurs in the lower Chesapeake Bay and the associated figure. The Navy added clarification in Sections 2.2.4 and 2.2.5 for the reader to understand what actions would occur in each training area proposed.

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Comment No.	Agency or Public Comment	Navy Response
F2-5	Re: Table 2.2-1 It's not clear how these descriptions relate to the kind of specific training that is proposed for the lower Chesapeake bay.	The descriptions of the naval warfare mission areas contained in Table 2.2.1 are general in nature to give the reader a general concept of the type of range operations in each category. A note was added to refer the reader to Sections 2.2.4, 2.2.5, Table 2.2-4 and Appendix D for detailed information.
F2-6	Re: Table 2.2-1 The number (6) footnote is not explained in the key.	Typographical error was corrected.
F2-7	Re: page 3-11 Location of explosions should be indicated on a map and the impacts discussed in the FEIS.	The Navy added text in Section 3.1.3 to direct the reader to Figures 2.2-1, 2.2-5 through 2.2-10 for locations of all proposed detonations.
F2-8	Re: page 3-12 Acronym undefined (CFMETR). Elaborate to determine credibility of these studies performed and cited.	The acronym was added to the acronym list. As the study directly applies to the Navy's proposed action and the fact that no other studies of similar nature are known, it was reasonable to include the findings.
F2-9	Habitat and importance of Chesapeake Bay should be discussed in greater detail, including native oyster restoration efforts and necessary coordination.	Habitat of Chesapeake Bay and native oyster restoration efforts are addressed in Section 3.6 of the DEIS. The Navy added discussion of these topics in greater detail in the FEIS. See Section 3.6
F2-10	The EIS should explain how the proposed action relates to the Chesapeake 2000 agreement and any necessary mitigation	The Navy reviewed the Chesapeake Bay Program goals set forth in www.epa.gov/region3 and comports to these policies. See Section 3.3.2.4.
F2-11	Re: 3-29 Not clear what is meant by statement: Hazardous waste have impacts on the environment regardless of military munitions not considered hazardous waste when used for their intended purposes. Does the Navy still consider impacts caused by HW from MM?	"Hazardous Waste" is a precise regulatory term, as defined by 40 CFR pt 260. The Military Munition Rule specifically states that munitions used for their intended purposes are not solid waste, and therefore, cannot be Hazardous Waste. As munitions used within the study area are not solid wastes, it is inappropriate to refer to them as "hazardous waste". However, be assured that this EIS does consider and analyze the potential environmental consequences of the potentially hazardous constituents, those contained within, as well as those released, of all munitions.
F2-12	Re: 3-30 Is it possible to estimate the amount of training materials to be discarded each year for the proposed action and consider cumulative materials from other operations to reasonably assess the accumulation of debris?	The analysis of the effects of expended materials on bathymetry and sediments is located in Section 3.1.3. The analysis of the cumulative impacts of expended materials and marine debris are discussed in Sections 6.2.7 and 6.4.1.2, respectively.

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Comment No.	Agency or Public Comment	Navy Response
F2-13	Are the off shore area identified where discarded training materials will be deposited? Cumulative impacts need to be addressed.	Areas where training occurs, and training materials are expended, are identified in the document. For example, refer to Tables 2.2-6, 2.2-7,and 3.2-1. The analysis of the cumulative impacts of expended materials and marine debris are discussed in Sections 6.2 and 6.4 respectively.
F2-14	Re: page 3-8 Why is 20 years used to evaluate accumulation of materials?	Text was added to Section 3.1.3 to clarify why 20 years was used as a benchmark for accumulation of debris.
F2-15	Re: page 3-8 How does the reference to sediment quality relate to DEIS assessment? Explain in FEIS.	Text was added to Section 3.1.3.1 to clarify the relationship of the reference (ESG, 2005) to the current assessment.
F2-16	Request additional information regarding efforts to minimize and reduce the amounts of HM deposited into the ocean from training material expenditure	With the exception of recoverable floating, towed, and airborne targets, most items expended during Navy at-sea training events are not recovered, as they rapidly sink and recovery is not practicable.. The Navy has recently implemented the Water Range Sustainability Environmental Program Assessment (WRSEPA) Policy (29 Aug 08) to ensure the long-term viability of our operational ranges while protecting human health and the environment. The impact of training materials expended in the marine environment will be a focus of that program. The preferred alternative proposed in this document provides an example of the Navy's commitment to reduce our potential impact on the marine environment. Under the preferred alternative, at-ea bombing operations conducted within the VACAPES OPAREA will reduce the use of explosive-filled bombs. See Sections 2.2.5, 3.2 and 3.3.
F2-17	Bioaccumulation of contaminants in the food chain should be discussed.	Section 3.2.3 was revised to address the issue of bioaccumulation of contaminants in the food chain.
F2-18	Re: page 3-32 Discuss the basis for why water quality sampling or modeling was not required.	The Navy has recently implemented the Water Range Sustainability Environmental Program Assessment (WRSEPA) Policy (29 Aug 08) to ensure the long-term viability of our operational ranges while protecting human health and the environment. The impact of training materials expended in the marine environment will be a focus of that program. See Section 3.1.3.1 for a description of a Canadian study that analyzed the fate of similar expended material and the potential impact of the environment.

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Comment No.	Agency or Public Comment	Navy Response
F2-19	Re: page 6-22: states variables that affect water quality, but DEIS does not address the effect of potential temperature changes caused by proposed actions. Cumulative effects should be discussed.	A discussion of global climate change has been included in Section 6.3
F2-20	Re: page 3-139 States fin whale occurrence in Chesapeake Bay Feb-May with greatest likelihood of encounter Jan- Mar. Where did January come in?	This was a typographical error and was changed to “winter months” in the FEIS
F2-21	FEIS should clearly state how far marine mammals should be from sonar to be impacted. Will the monitors be able to see the marine mammals before they are impacted?	All sonar effects are discussed and analyzed in the Atlantic Fleet Active Sonar FEIS/OEIS, Chapter 4, Section 4.4. http://afasteis.gcsaic.com/docs.aspx
F2-22	Re: page 3-193 State the rationale for waiting 30 minutes after a marine mammal in ZOI.	The Navy added text (Section 3.7) and an accompanying table (Table 3.7-11) regarding average dive times for marine mammals.
F2-23	Re: page 3-211 and all other places “No significant impact should be explained.	The factors used to determine the significance of effects under NEPA are explained in each of the resource-specific sections (i.e. Section 3.7.1.1) under "Factors Used to Assess Effects". For marine mammals and Endangered Species Act (ESA) listed species, the Navy's significance conclusions in the FEIS are based on input obtained from the National Marine Fisheries Service and the US Fish and Wildlife Service during the ESA Section 7 consultation and Marine Mammal Protection Act permitting processes. See revised conclusions in Chapter 3 within each of the resource areas for an explanation of the determination of no significant impact.
F2-24	Re: page 3-329 Does not appear that SHPO in all states are included in Distribution list. In the FEIS show the involvement with the SHPOs.	See Appendix C for correspondence with each applicable SHPO.

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Comment No.	Agency or Public Comment	Navy Response
F2-25	Re: Chapter 6 Navy should discuss in more detail the impacts of other Navy actions will there be added impact? It is unclear whether the BOs cited in page 6-8 includes a full evaluation of the VACAPES study area. Could these projects impact marine mammal migration or bird migration?	Chapter 6 has been revised and provides clarification and additional details. The 1997 BO for the Southeast and the 2002 BO for North Carolina discussed in Chapter 6 will be superseded by the ESA Section 7 consultation for the proposed action which is currently underway. The consultation includes an evaluation of the proposed actions within three Navy range complexes (VACAPES, Cherry Point, and Jacksonville Range Complexes) and will include an analysis of the cumulative impacts to marine mammal and ESA listed species
F2-26	Re: page 3-364 says that there was coordination with FAA. Does FAA approve of preferred alternative?	The sentence is referring to the fact that FACSFAC VACAPES coordinates with FAA to deconflict aircraft activities as an ongoing procedure. FAA has not indicated an opinion regarding our proposed action.
F2-27	Are there additional impacts from the use of contractor aircraft, including increased activity on roads, other transportation issues, etc?	As indicated in the FEIS, Commercial Air Services use established civilian airfields. Potential impacts from the use of Commercial Air Services are addressed in Sections 3.4 Air Quality and 3.5 Airborne Noise. Cumulative impacts are addressed in 6.4.4 Air Quality and 6.4.5 Airborne Noise. No other impacts expected from use of contractor aircraft.
S1- Delaware Department of Natural Resources- Division of Soil and Water Conservation		
S1-1	Concerned about MEM fouling areas of usable sand resources for beach replenishment.	The Navy addressed the issue of the proposed actions and any potential impact to sand shoals used for beach nourishment in Section 3.1.3.1
S1-2	Concerned about proposed wind farm 13 nm off Delaware coast.	The Navy does not anticipate any issues between the referenced proposed wind farms and military operations, as described in the FEIS.
S2- Virginia Department of Environmental Quality- Air Division		
S2-1	Concerned about volatile organic compounds (VOCs) and nitrogen oxide emissions during construction.	The Navy is not proposing any new construction and therefore there will be no construction-related emissions of VOCs or NO_x
S3- Virginia Department of Historic Resources		

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Comment No.	Agency or Public Comment	Navy Response
S3-1	Requests that the Navy take all precautions to avoid shipwrecks in order to minimize to the extent possible, the potential to impact important resources. Exercises involving explosives should be limited to areas without known shipwrecks, and moored mine shapes should be deployed in a fashion and with proper supervision so they will not land on shipwrecks.	The Navy modified the text in Section 3.12 to explain the procedures used to avoid impacting cultural resources.
S3-2	DHR requests that the Navy consult directly with them regarding Section 106 of the National Historic Preservation Act.	The Navy is consulting with DHR regarding Section 106 of the NHPA. See Section 3.12 and Appendix C.
S4- Virginia Department of Conservation and Recreation		
S4-1	Recommends coordinating with VDGIF, NMFS, and USFWS regarding state and federally protected sea turtles, whales, and marine mammals.	The NMFS is a cooperating agency on the VACAPES EIS/OEIS; therefore, close coordination has and continues to occur regarding protected marine species. In addition, the Navy has coordinated its proposed actions with the USFWS. The VDGIF received notice of the proposed actions and has provided the Navy with written comments.
S5- Virginia Department of Mines, Minerals and Energy		
S5-1	The report does not address the impact on, or coexistence with, possible future infrastructure related to development of alternative energy sources such as wind waves, or currents on the continental shelf, their associated power transmission lines, and their associated onshore support facilities.	The Navy added text to address the potential cumulative impacts of possible future development of alternative energy on the Outer Continental Shelf. See Section 6.2.2.
S5-2	The report does not assess the potential impact of increased Navy activity on the potential exploration and development of offshore mineral and/or oil and gas resources.	The Navy addressed the potential cumulative impacts of exploration, extraction and production of mineral, oil and gas on the Outer Continental Shelf. See Section 6.2.2.
S6- Maryland Environmental Science		
S6-1	MES recommends Navy coordinate with NOAA regarding ship speed, especially during NARW migration.	The Navy is consulting with NMFS through the MMPA and ESA compliance process and additional mitigation measures may be developed as appropriate for the North Atlantic right whale.

Comment No.	Agency or Public Comment	Navy Response
S6-2	MES has concern that potential conflicts of commercial shipping traffic, including financial loss to the Port of Baltimore, with Navy training have not been adequately addressed in the document.	The Navy has contacted Association of Maryland Pilots (AMP) and has made changes to the text in Section 3.13. Clarification has been added to Sections 3.13 (Transportation) and 3.15 (Regional Economy) to indicate that the training areas would not be in the transit lanes nor interfere with commercial shipping traffic.
S7- Virginia Department of Game and Inland Fisheries		
S7-1	The seabird and migratory bird section makes no mention of coastal avian species that nest of the barrier islands and ocean facing beaches directly adjacent to the Study Area. Also concerned about shorebirds, sea ducks and migrating land species that may cross into the Study Area.	The Navy reviewed all of these avian groups and determined which ones may be encountered and impacted by Navy training. Additional assessment is in Section 3.10.
S7-2	The document does not identify bird, sea turtle, or marine mammal occurrences (or takes) observed during past training exercises within VACAPES. If such information exists, it should be included in the EIS.	The Navy stated in Section 3.10 that the bird strike database was examined and no strikes were listed for the Study Area. There is currently no database of marine mammal or sea turtle occurrences during training operations. There are a few occurrences documented in the after action reports for the 2008 Atlantic Fleet Active Sonar at http://www.nmfs.noaa.gov/pr/pdfs/permits/afast_aar_combo.pdf, however these are a very small set of data. Marine mammal and sea turtle sighting information will be collected as part of the monitoring requirements as determined by consultation with NMFS. See Chapter 5 Section 5.3 for more details.
S7-3	VDGIF is concerned about the speculative nature of the discussion of expended materials on *Sargassum* mats and recommends a study to quantitatively determine the level of MEM on *Sargassum* mats following a Navy exercise using such material.	The NMFS is a cooperating agency on the VACAPES EIS/OEIS and the Navy is in Section 7 consultation. Therefore, close coordination continues to occur regarding protected marine species. In addition, the Navy has coordinated its proposed actions with the USFWS. Thank you for your recommendation.

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Comment No.	Agency or Public Comment	Navy Response
S7-4	The DEIS does not address potential disturbance that mine warfare training in the lower Chesapeake Bay may have on breeding shorebirds, wading birds, waterfowl, rails, and seabirds that nest in the marshes and beaches along the eastern and western shores of the lower Chesapeake Bay during the months of April - August. It also does not address these activities on large numbers of sea ducks and sea birds that winter in the lower Chesapeake Bay.	The Navy reviewed all the avian groups and determined which ones may be encountered and impacted by Navy training. Additional assessments included in Section 3.10.
S7-5	Recommends that any discussion about cumulative impacts consider the magnitude of the increase in impacts with the addition of each activity.	Cumulative impacts are addressed in Chapter 6, and are analyzed in accordance with CEQ guidance.
S7-6	Recommends continued coordination with USFWS regarding possible impacts on federally listed species and with VDGIF regarding federally listed and state-listed species.	The Navy completed informal consultation with the USFWS in accordance with Section 7 of the Endangered Species Act and the related correspondence is included in Appendix C.
S7-7	Re: Section 3.7 Harbor seal, harp seal, and gray seal occurrences in the inshore and nearshore waters of the mid-Atlantic region are becoming more frequent in the fall and winter months. Recommend inclusion of this information	This information was added in Section 3.7
S7-8	Green sea turtles nest on beaches adjacent to the VACAPES Range Complex (Northern Outer Banks of North Carolina) and one documented in VA Beach in 2005.	Information on Green sea turtles nesting on beaches adjacent to the VACAPES Range Complex (Northern Outer Banks of North Carolina) and one in VA Beach in 2005 was updated. See Section 3.8.2.2
S7-9	Leatherback nesting has been documented on the Outer Banks of NC and has been increasing in the state over the last decade.	Information on Leatherback turtles nesting on the Outer Banks of NC has been updated. See Section 3.8.2.5
S7-10	Section of sea turtle density estimates should be recalculated using more recent data on sea turtle surfacing times, behavior and detectability rates in K.L. Mansfield (2006)	Density estimates were calculated using the best available data and methods in consultation with experts at Centre for Research into Ecological and Environmental Modeling and NMFS. Detection probability was taken into account in the density estimate process. See the Navy OPAREA Density Estimate Report for a full explanation of how density estimates were calculated: http:// www.vacapesrangecomplexeis.com/documents/ DON_2007i_SE_NODE_Final_Report.pdf. As more data becomes available, the Navy is committed to reviewing and updating density estimates as appropriate.

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Comment No.	Agency or Public Comment	Navy Response
S7-11	Recent data presented in the loggerhead sea turtle 5 yr review suggests that three of four subpopulations are decreasing.	Comment noted and text has been revised. The 5 year review does not change our conclusions.
S7-12	Many of the seabird occurrence periods listed in Table 3.10-2 are incorrect. There is no mention of occurrence or impact on piping plover, Wilson's plover, American Oystercatcher, and black skimmer.	Table 3.10-2 has been updated and corrected. During the informal consultation with US Fish and Wildlife Service, it was agreed to set Mine Warfare training areas 1 nm off the shoreline in the Chesapeake Bay. This action would reduce potential noise impacts on birds that frequent the Virginia beaches like those mentioned- American Oystercatcher, Black Skimmer, Wilsons Plover and Piping Plover. No additional assessment was done to specifically address these species because of a lack of stressors from Navy training.
S7-13	The DEIS mitigation measures rely on observers' ability to detect sea turtles, marine mammals, and Sargassum under all conditions (high seas, darkness, storms, etc). Recommend adding discussion about effectiveness of lookouts in all conditions	The Navy implements mitigation measures in accordance with NMFS coordination. No mitigation is 100% effective; however refer to section 5.10 for a discussion on mitigation effectiveness, such as percentage of marine mammals spotted during a survey. The Navy is developing a monitoring plan with NMFS to assess the efficacy and practicality of the monitoring and mitigations proposed.
S7-14	DEIS lacks mitigation measures for seabirds, shorebirds, and other migratory and breeding species occurring in the VACAPES Study Area.	Some of the mitigation measures contained in Chapter 5 of the DEIS, such as avoidance of *Sargassum* mats, would help to avoid and minimize potential impacts to birds. The analysis presented in the DEIS indicates that the Proposed Action would not result in significant impacts to bird populations. Therefore, additional mitigation measures are not necessary.
S7-15	Recommends that the final ICMP be included in the FEIS/OEIS	As outlined in the NMFS Proposed Rule, the finalization of the overall ICMP will not be completed until late 2009. A summary of the VACAPES Range Complex monitoring plan can be found in Chapter 5 Section 5.3.
S7-16	The evaluation of impacts and natural resources protection measures included in the VACAPES Range Complex DEIS should be consistent with those incorporated in other Range Complex DEISs in order to afford the greatest protection for migrating species that cross training range boundaries.	The evaluation of impacts and natural resources protection measures included in the VACAPES Range Complex FEIS are consistent with those incorporated in other Range Complex FEISs in order to afford the greatest protection for migrating species that cross training range boundaries.

Comment No.	Agency or Public Comment	Navy Response
S7-17	DEIS should include detailed descriptions of all current and predicted future training operations.	FEIS includes detailed descriptions of all current and predicted future training operations.
S7-18	All natural resource impact assessments should encompass the entire annual cycle rather than just the season or window of time when the operations are predicted to occur, in case training operations are conducted outside of the schedule time frame.	Most training operations occur at various seasons of the year and therefore the assessment does not consider “windows” of time.
S7-19	All wildlife resource impact assessments should address effects on associated prey species and foraging habitats.	Indirect effects to animal species are considered in the assessment.
S7-20	All natural resource impact assessments must consider the short and long term effects on all land, water, and air space habitats within the effected area.	The FEIS considered both long and short term effects within the Study Area.
S7-21	The Navy should attempt to make available on-line all gray literature that is cited in the DEIS.	All references used for this FEIS/OEIS are maintained as part of the official Administrative Record. However, some information is subject to copyright protection and can not be released directly by the Navy.
S7-22	The DEIS should assess natural resource impacts of transporting aircraft, ships, small watercraft, vehicles, equipment, and supplies to and from the Hampton Roads naval bases and the training range complex.	Delivery of weapon systems (aircraft, ships, missiles, etc) is evaluated in homebasing environmental documents and is not in the scope of the current EIS/OEIS. Number of Steaming days for vessel traffic is reported in the EIS and can be found in Table 2.2-5
S7-23	The Navy should avoid duplicating training operations among the different US Range Complexes as one way to minimize natural resource impacts over a broad geographic area.	See Section 2.2.7.1 for alternatives eliminated from further consideration for information regarding alternative range complex locations.
S8- Virginia Department of Environmental Quality		
S8-1	Same comment as S7-6.	See Navy response to S7-6
S8-2	FEIS should address potential impacts on offshore energy resources identified in the impacts and mitigation section of this report	Additional Cumulative Impacts discussion has been included in Chapter 6.
S8-3	Comment same as S7-12.	See Navy response to S7-12

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Comment No.	Agency or Public Comment	Navy Response
S8-4	DEIS does not address possibility of presence of migratory landbirds that are likely to select nearshore and offshore pathways.	The Navy reviewed all the avian groups and determined which ones may be encountered and impacted by Navy training. Additional assessments included in Section 3.10.
S8-5	Wants sea turtle and marine mammal occurrences or takes observed during past training operations in VACAPES.	There is currently no database of marine mammal or sea turtle occurrences during training operations. There are a few occurrences documented in the after action reports for the 2008 Atlantic Fleet Active Sonar at http://www.nmfs.noaa.gov/pr/pdfs/permits/afast_aar_combo.pdf, however these are a very small set of data. Marine mammal and sea turtle sighting information will be collected as part of the monitoring requirements as determined by consultation with NMFS. See Chapter 5 Section 5.3 for more details.
S8-6	Same comment as S7-4	See Navy response to S7-4
S8-7	Same comment as S7-3	See Navy response to S7-3
S8-8	Same comment as S7-7	See Navy response to S7-7
S8-9	Same as comments S7-8, S7-9 and S7-11	See Navy responses to S7-8, S7-9, and S7-11
S8-10	Same comment as S7-12	See Navy response to S7-12
S8-11	Same comment as S7-13	See Navy response to S7-13
S8-12	Same comment as S7-14	See Navy response to S7-14
S8-13	Same as comments S7-15	See Navy response to S7-15
S8-14	Same as comment S7-5	See Navy response to S7-5
S8-15	Same as comment S7-3	See Navy response to S7-3
S8-16	Same as comment S7-4	See Navy response to S7-4
S8-17	Same as comment S7-7	See Navy response to S7-7
S8-18	Same as comment S7-10	See Navy response to S7-10

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Comment No.	Agency or Public Comment	Navy Response
S8-19	Same as comment S7-13	See Navy response to S7-13
S8-20	Add a discussion on training and procedures for lookouts and watchstanders	Section 5.5.1 contains information on the Navy's Watchstander program.
S8-21	Same as comment S7-15	See Navy response to S7-15
S8-22	According to Biotics Data System several state and federally listed sea turtles, whales, and marine mammals are located in the project vicinity and may be affected by the proposed activity	As the Federal agency with the authority to manage marine mammal species and as a cooperative agency to this EIS/OEIS, NMFS has reviewed the species identified that occur in the VACAPES Range Complex. See Section 3.7.
S8-23	Same as comment S4-1	See Navy response to S4-1
S8-24	Recommends the Navy take all reasonable precautions to limit emissions of VOCs and NO_x, principally by controlling or limiting the burning of fossil fuels.	Comment noted.
S8-25	Same as comment S5-1	See Navy response to S5-1
S8-26	Same as comment S5-2.	See Navy response to S5-2
S8-27	Same as comment O1-1	See Navy response to 01-1
S8-28	Requests that the Navy consult directly with the Department of Historic Resources pursuant to Section 106 of the NHPA	The Navy is consulting with DHR regarding Section 106 of the NHPA. See Section 3.12 and Appendix C.
S9- North Carolina Department of Administration		
S9-1	Open burning permit.	There will be no open burning included in any of the alternatives and therefore no permit would be required.
S9-2	Permit required for demolition or renovation of structures containing asbestos.	There will be no demolition or renovation of structures included in any of the Navy's alternatives and therefore no permit required.
S9-3	Permit required for one or more acres of land disturbing activity.	There will be no land disturbing activity included in any of the Navy's alternatives and therefore Erosion and Sedimentation Control Plan is not required.

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Comment No.	Agency or Public Comment	Navy Response
S9-4	Water Quality Certification required.	All Navy training with respect to the VACAPES Range Complex off the coast of North Carolina will be at least 3 nm from shore and therefore a water quality permit would not be required.
S9-5	Tar Pamlico or Neuse Riparian Buffer Rules required.	The Navy's alternatives are outside the Tar Pamlico and Neuse River watersheds and therefore these Rules do not apply.
O1- Virginia Institute of Marine Science		
O1-1	No mention of impacts on the efforts of the Virginia Coastal Energy Research Consortium.	The Navy has consulted with the Virginia Coastal Energy Research Consortium.
O2- Association of Maryland Pilots		
O2-1	Neither Association of Maryland Pilots nor Association of Virginia Pilots included in distribution list.	The Navy added the Association of Maryland Pilots (AMP) and the Association of Virginia Pilots (AVP) to their Distribution list for future mailings.
O2-2	Re: page 3-356 and3-358 Concern with the proposed increase in naval operations will cause disruption to the schedules of the ships calling upon ports on the Chesapeake Bay. Operating costs are huge and commercial shipping extremely competitive and delays can be costly.	Most of the increases in the Chesapeake Bay are primarily helicopter operations training in Mine Warfare. It is the Navy's intention that these increases will not cause any disruptions in commercial shipping, since aircraft towing MIW equipment would maneuver in such a way as to not be a navigation hazard to surface vessels.
O2-3	Re: Section 6.4.13.1 DEIS is not specific how ship traffic will be affected; speaks only in generalities, short-term and temporary.	Description in Chapter 6 was expanded to add more information.
O2-4	Request AMP meet with the Command in order to thoughtfully address the intended protocol for resolving conflicts between the navy's need for additional training days in the OPAREA and the long-standing traffic patterns developed by vessels call at ports on the Chesapeake Bay.	The Navy has contacted Association of Maryland Pilots (AMP) and has made changes to the text in Section 3.13. Clarification has been added to Sections 3.13 (Transportation) and 3.15 (Regional Economy) to indicate that the training areas would not be in the transit lanes nor interfere with commercial shipping traffic.
O3 – Merchant Marines		
O3-1	Requested that Notices to Mariners be issued sooner than 3 days. The more lead time commercial ships are given, transit course corrections are less costly.	FACSFAC VACAPES has established points of contact and revised guidelines for issuing Notice-to-Mariners in order that commercial shipping can receive as much advance notice as possible for planning time and routes into ports adjacent to the VACAPES Range Complex. See Section 3.13.1.6

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Comment No.	Agency or Public Comment	Navy Response
O4 – VA Aquarium and Marine Science Center		
O4-1	Concerned with watchstanders on very high-speed Navy vessels having enough time to change the ship's course when a whale is observed in its course.	The Navy has consulted with NMFS regarding protected species under their authority. In addition, NMFS is a cooperating agency regarding this EIS/OEIS.
O4-2	Concerned with the density data the Navy uses and recommends using minimal densities for species in different times of the year when survey data are lacking.	The Navy has consulted with NMFS regarding protected species under their authority. In addition, NMFS is a cooperating agency regarding this EIS/OEIS.
O4-3	Concerned that the designated marine mammal observers are only effect during perfect conditions and those conditions rarely exist.	The Navy has consulted with NMFS regarding protected species under their authority. In addition, NMFS is a cooperating agency regarding this EIS/OEIS.
P1- Ron Gladkowski		
P1-1	Concerned that the Navy's operations will interfere with fishing tournaments. Most fishing tournaments from New Jersey to North Carolina extend limits to 100 miles off shore. Can the Navy move their training to beyond the 100 mile limit so as not to interfere? Can Navy training be scheduled for winter months when no fishing tournaments are scheduled?	The Navy strives to conduct its activities in a manner that is compatible with both commercial and recreational ocean users. To ensure safety and minimize inconveniences, the Navy provides Notices to Mariners in advance to notify ocean users of naval activities in designated Navy ranges and operating areas. When possible, the Navy will conduct operations to avoid interference, but in some cases there are distance restrictions from shore based facilities that must be considered and training and deployment planning may not allow for schedule changes.
P2- Sharon Stewart		
P2-1	Concerned about the health and welfare of marine mammals and sea turtles.	NMFS is a cooperating agency on the EIS. The Navy implements mitigation measures in accordance with NMFS coordination.
P3- Joan Kean		
P3-1	Concerned that environmental factors be evaluated and proper protections put in place.	The Navy carefully considers all relevant environmental factors in order to avoid impacts to human health or the environment. Section 3.18 addresses human health and safety and Sections 3.1 through 3.12 address environmental issues.
P3-2	Concerned that economic factors be adequately considered.	Concerned that economic factors be adequately considered. Economic factors are addressed in Sections 3.14 through 3.17 of the EIS/OEIS.
P3-3	Concerned of possible competition evolving between Navy and NASA and commercial spaceport endeavors	Concerned of possible competition evolving between Navy and NASA and commercial spaceport endeavors. The Navy works closely to coordinate operations and deconflict operations using the same location.

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Comment No.	Agency or Public Comment	Navy Response
P4- Claudia Alesi		
P4-1	Was told explosives were not detrimental to marine mammals or sea turtles. If this is so, then why did Federal judge in Hawaii ban high intensity, mid frequency sonar in Hawaiian waters? Claimed the Navy ignored the MMPA and refused to do an EIS. Claims there is overwhelming evidence against sonar and explosives. Combine these three comments into one comment for P4.	NMFS is the federal authority regarding marine mammals and is a cooperating agency on the EIS/OEIS. The Navy implements mitigation measures in accordance with NMFS coordination.
P5- Lauren Heesemann		
P5-1	Concerned that "spotters" aboard a vessel is insufficient. What about whales and other marine mammals that spend 80% of their time at depth?	No mitigation is 100% effective; however refer to Section 5.10 for a discussion on mitigation effectiveness, such as percentage of marine mammals spotted during a survey. The Navy is developing a monitoring plan with NMFS to assess the efficacy and practicality of the monitoring and mitigations proposed.
P6- Jean Public		
P6-1	The Navy is bombing the heck out of the ocean so that the ecology is damaged beyond repair and human health is impacted.	The Navy has recently implemented the Water Range Sustainability Environmental Program Assessment (WRSEPA) Policy (29 Aug 08) to ensure the long-term viability of our operational ranges while protecting human health and the environment. The impact of training materials expended in the marine environment will be a focus of that program. The preferred alternative proposed in this document provides an example of the Navy's commitment to reduce our potential impact on the marine environment. Under the preferred alternative, at sea bombing operations conducted within the VACAPES OPAREA will reduce the use of explosive filled bombs. See Sections 2.2.5, 3.2, and 3.3
P7- Tom McClure		
P7-1	Concerned that the underwater explosions can cause fish to take different migratory routes.	NMFS is the federal authority regarding fish and is a cooperating agency on the EIS/OEIS. The Navy implements mitigation measures in accordance with NMFS coordination. The Navy has devoted Section 3.9 to the potential impacts of training operations on fish and has a lengthy discussion on underwater explosions in this section.

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Comment No.	Agency or Public Comment	Navy Response
P8- John B. Stewart		
P8-1	Would like to see data on low frequency sonar and what the Navy has decided to do with that type of sonar.	The AFAST FEIS/OEIS only addressed Mid and high frequency sonar. Information on the Navy's low frequency sonar can be found at: http://www.surtass-lfa-eis.com/
P9- Ellis W. James		
P9-1	Concerned about the increase proposed of helicopter flights over the Chesapeake Bay and the potential impacts on fishing.	The Navy has met with fishing groups and has discussed our proposals with them. These activities will have no long term effects on fish populations (section 3.9.3.3), and as no operations involving ordnance are planned for the Chesapeake Bay, closure of areas via NOTMARs is not anticipated. Navy activities will make all efforts to avoid conflicts with commercial and recreational fishing activities.
P9-2	Concerned about the watchstander program, the number of watchstanders and their ability to do their job.	No mitigation is 100% effective; however refer to section 5.10 for a discussion on mitigation effectiveness, such as percentage of marine mammals spotted during a survey. The Navy is developing a monitoring plan with NMFS to assess the efficacy and practicality of the monitoring and mitigations proposed.
P9-3	What's the usages of different sonars- high, mid-frequency or other types?	The Navy sonar training is evaluated in the Atlantic Fleet Active Sonar Training EIS/OEIS and is summarized in this EIS/OEIS in Section 3.19, Table 3.19-2.
P10- Debora Mosher		
P10-1	Strongly encouraged the selection of the Preferred Alternative because of the reduction of bombs proposed. Very pleased at the thoroughness of the EIS/OEIS.	Thank you, comment noted.

INTRODUCTION

Four public hearings were held 14-17 July 2008 to receive public comments on the VACAPES Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS). The hearings were held in Ocean City, MD; Chincoteague and Virginia Beach, Virginia, and Kitty Hawk, North Carolina. The following is information resulting from each of these hearings.

PUBLIC HEARING #1

The first public hearing was held in ocean City, Maryland, at the Princess Royale oceanfront Hotel, July 14, 2008. The public was invited to attend an open-house from 5-7 pm during which time the Navy displayed six poster stations on various information regarding the EIS/OEIS. Subject Matter Experts (SME) were present to answer questions. From 7-9 pm a formal hearing was held and public comments were solicited. Six speakers from the general public made a presentation. Thirty-four people attended the open house, the hearing, or both. No written comments were received during the meeting. The following pages are scanned copies of the sign-in sheets, speaker cards, and transcript of the formal hearing.

VACAPES Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name SHARON STEWART **Address** 30347 TERRACE LD **City/State/Zip** OCEAN VIEW, DE. 19970 **E-mail** stewdel@verizon.net **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☒ CD
Name Randy Hill **Address** **City/State/Zip** **E-mail** 410 251-6800 – H 410-641-2222 **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
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Name JOE CICCANTI **Address** **City/State/Zip** Lewes, 19958 **E-mail** NewsGW@WGMD.com **Organization/Constituency Represented (if any)** WGMD Radio	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name Shelly Schwartz **Address** **City/State/Zip** **E-mail** SSchwartz@wboc.com **Organization/Constituency Represented (if any)** WBOC News	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
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VACAPES Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

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Date: _____

VACAPES Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name Shawn J. Soper **Address** Maryland Coast Dispatch **City/State/Zip** **E-mail** SSoper@mdcoastdispatch.com **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name Lee L. Whaley **Address** US Sen Ben Cardin Ofc PO Box 11 **City/State/Zip** Salisbury MD 21801 **E-mail** lee_whaley@cardin.senate.gov **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name **Address** **City/State/Zip** **E-mail** **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name **Address** **City/State/Zip** **E-mail** **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD

Date:_____

6100

VACAPES Range Complex

Environmental Impact Statement/
Overseas Environmental Impact Statement

Speaker Request Form

Public Hearing

July 2008

Name: Steve Habega

Address: 5 Hudson Place
Ocean Pines MD 21811

Organization/ Constituency Represented (if any): Eastern Shore Defense Alliance

Date: 14 July 08

VACAPES Range Complex

Environmental Impact Statement/
Overseas Environmental Impact Statement

Speaker Request Form

Public Hearing

July 2008

Name: Tom McCLURE

Address: DE

Organization/ Constituency Represented (if any): _____

Date: July 14 08

VACAPES Range Complex

Environmental Impact Statement/
Overseas Environmental Impact Statement

Speaker Request Form

Public Hearing

July 2008

Name: JOHN B. STEWART

Address: 30347 TERRACE RD

OCEAN VIEW, DE 19970

Organization/ Constituency Represented (if any): _____

Date: 7/14/2008

VACAPES Range Complex

Environmental Impact Statement/
Overseas Environmental Impact Statement

Speaker Request Form
Public Hearing

July 2008

Name: Eric Clarke

Address: Delaware

Organization/ Constituency Represented (if any): _____

Date: 7-14-08

VACAPES Range Complex

Environmental Impact Statement/
Overseas Environmental Impact Statement

Speaker Request Form

Public Hearing

July 2008

Name: Richard Meehan

Address: Ocean City Maryland

Organization/ Constituency Represented (if any): Town of Ocean City

Date: 7/14/08

PUBLIC HEARING #2

The second public hearing was held in Chincoteague, Virginia, 15 July, 2008. The public was invited to attend an open-house from 5-7 pm during which time the Navy displayed six poster stations on various information regarding the EIS/OEIS. Subject Matter Experts (SME) were present to answer questions. From 7-9 pm a formal hearing was held and public comments were solicited. No speakers from the general public made presentations. Twelve people attended the open house, the hearing, or both. One written comment was received during the meeting. The following pages are scanned copies of the sign-in sheets, speaker cards, comment forms, and transcript of the formal hearing.

VACAPES Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name BRIAN JULIAN CDR	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address 30 Battle Group Way	
City/State/Zip Wallops Island Va 23337	
E-mail Brian.Julian@navy.mil	
Organization/Constituency Represented (if any) SCSC Wallops Is	

Name Joshua Bundick	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☒ CD
Address NASA Wallops Flight Facility	
City/State/Zip Wallops Island VA 23337	
E-mail Joshua.A.Bundick@nasa.gov	
Organization/Constituency Represented (if any) NASA Wallops Flight Facility	

Name David Johnson	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address 6368 Circle Dr.	
City/State/Zip Chincoteague VA 23336	
E-mail davidjohnson@verols.com	
Organization/Constituency Represented (if any)	

Name Joan Kean	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address P.O. Box 269	
City/State/Zip Chincoteague VA.	
E-mail adak@dmv.com	
Organization/Constituency Represented (if any)	

Date: 7-15-08

VACAPES Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name CDR Gerald Herman	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address 30 Battle Group Way	
City/State/Zip Wallops Island, VA 23464	
E-mail gerald.d.herman@navy.mil	
Organization/Constituency Represented (if any) U.S. Navy RTD&E	

Name Sylvia Parks	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address Accomac Ofc. POBx 447	
City/State/Zip Accomac, Va. 23301	
E-mail Sylvia.parks@mail.house.gov	
Organization/Constituency Represented (if any) Cong. Thelma Drake	

Name Shari Silbert	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address Building F-1100, Rm C-165	
City/State/Zip Wallops Island, VA 23337	
E-mail Shari.A.Silbert@nasa.gov	
Organization/Constituency Represented (if any) NASA WFF	

Name Michael Jump	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address 30 Battle Group Way	
City/State/Zip Wallops Island, VA 23337	
E-mail Michael.jump1@navy.mil	
Organization/Constituency Represented (if any) SCSC	

Date: 7-15-08

VACAPES Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name Harvey Spurlock **Address** 3912 Main St **City/State/Zip** Chincoteague, VA 23336 **E-mail** hspurlock@alionscience.com **Organization/Constituency Represented (if any)** Alion Science & Tech	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name JEFF LEE **Address** 37317 DUBLOON DR **City/State/Zip** GREENBACKVILLE VA 23356 **E-mail** JEFFLEE@MAC.COM **Organization/Constituency Represented (if any)** —	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name LARRY McMURRY **Address** 8103 BAILEYS LANE **City/State/Zip** CHINCOTEAGUE VA 23336 **E-mail** MCMURRYL@COMCAST.NET **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name **Address** **City/State/Zip** **E-mail** **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD

Date: 7-15-08

VACAPES Range Complex

Environmental Impact Statement/
Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name Rich Bitting

Address 8103 Chincoteague

City/State/Zip Chincoteague VA 23336

E-mail rich.bitting@navy.mil

Organization/Constituency Represented (if any)

The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box.
☐ CD

Name

Address

City/State/Zip

E-mail

Organization/Constituency Represented (if any)

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☐ CD

Name

Address

City/State/Zip

E-mail

Organization/Constituency Represented (if any)

The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box.
☐ CD

Name

Address

City/State/Zip

E-mail

Organization/Constituency Represented (if any)

The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box.
☐ CD

Date: 7-15-08

PUBLIC HEARING #3

The third public hearing was held in Virginia Beach, Virginia, at the Virginia Beach Resort and Conference Center, July 16, 2008. The public was invited to attend an open-house from 5-7 pm during which time the Navy displayed six poster stations on various information regarding the EIS/OEIS. Subject Matter Experts (SME) were present to answer questions. From 7-9 pm. a formal hearing was held and public comments were solicited. Three speakers from the general public made presentations. Twelve people attended the open house, the hearing, or both. One written comment was received during the meeting. The following pages are scanned copies of the sign-in sheets, speaker cards, comment forms, and transcript of the formal hearing.

VACAPES Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name ELLIS W. JAMES **Address** 2021 KENLAKE PLACE **City/State/Zip** NORFOLK, VA. 23518-5305 **E-mail** **Organization/Constituency Represented (if any)** SIERRA CLUB / CHES. BAY GRP	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☒ CD
Name Terri Boothe **Address** 528 Pinewood Dr **City/State/Zip** Va Bch VA 23451 **E-mail** theresaboothe@operamail.com **Organization/Constituency Represented (if any)** N/A	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☒ CD
Name Kelly Proctor **Address** 5037 Jonn Street **City/State/Zip** Chesapeake, VA 23321 **E-mail** **Organization/Constituency Represented (if any)** NAVFAC	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name Lauren Heesemann **Address** 5109 Dorset Mews **City/State/Zip** Williamsburg VA 23188 **E-mail** lauren.heesemann@noaa.gov **Organization/Constituency Represented (if any)** N/A	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD

Date: _____

VACAPES Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name Jennifer Tribo **Address** 723 Woodlake Dr. **City/State/Zip** Chesapeake, VA **E-mail** **Organization/Constituency Represented (if any)** HRPDC	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name GEORGE HAGERMAN, VIRGINIA TECH **Address** 4300 Wilson Blvd., Suite 750 **City/State/Zip** Arlington, VA 22203 **E-mail** hagerman@vt.edu **Organization/Constituency Represented (if any)** VIRGINIA COASTAL ENERGY RESEARCH CONSORTIUM	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name Susan Barco **Address** 717 General Booth Blvd **City/State/Zip** VABch 23451 **E-mail** sgbarco@virginiaquarium.com **Organization/Constituency Represented (if any)** Virginia Aquarium	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name DEBORA MOSHER **Address** 2019 FOX'S LAIR TRAIL **City/State/Zip** NORFOLK, VA 23518 **E-mail** **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD

Date:_____

VACAPES Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name S. BUSS **Address** 127 PRINCE ARTHUR DR **City/State/Zip** YORKTOWN, VA 23693 **E-mail** SSBUSS@COX.NET **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name TODD WILLIAMSON **Address** 3793 LILAC DR **City/State/Zip** PORTSMOUTH VA 23703 **E-mail** **Organization/Constituency Represented (if any)** NAVFAC	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name **Address** **City/State/Zip** **E-mail** **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name **Address** **City/State/Zip** **E-mail** **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD

Date:_____

VACAPES Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

MEDIA

Name Kate Wiltrout / reporter **Address** The Virginian-Pilot **City/State/Zip** 150 W. Brambleton **E-mail** **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name PAUL ZIEGLER **Address** 2517 WINGFIELD **City/State/Zip** NORFOLK VA 23518 **E-mail** **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name **Address** **City/State/Zip** **E-mail** **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Name **Address** **City/State/Zip** **E-mail** **Organization/Constituency Represented (if any)**	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD

Date:_____

5:05

1

VACAPES Range Complex

Environmental Impact Statement/
Overseas Environmental Impact Statement

Speaker Request Form

Public Hearing

July 2008

Name: ELLIS W. JAMES

Address: 2021 KENLAKE PLACE
NORFOLK, VA. 23518-5305

Organization/ Constituency Represented (if any): SIERRA CLUB / CHESAPEAKE BAY GROUP

Date: JULY 16, 2008

6:09 2

VACAPES Range Complex

Environmental Impact Statement/
Overseas Environmental Impact Statement

Speaker Request Form

Public Hearing

July 2008

Name: DEBORA MOSHER

Address: 2019 FOX'S LAIR TRAIL

NORFOLK, VA 23518

Organization/ Constituency Represented (if any): _____

Date: July 16, 2008

6:58 3

VACAPES Range Complex

Environmental Impact Statement/
Overseas Environmental Impact Statement

Speaker Request Form

Public Hearing

July 2008

Name: Susan Barco

Address: _____

_____

Organization/ Constituency Represented (if any): Virginia Aquarium

Date: 16 July 2008

PUBLIC HEARING #4

The fourth and final public hearing was held in Kitty Hawk, North Carolina, at the Hilton Garden Inn, July 17, 2008. The public was invited to attend an open-house from 5-7 pm during which time the Navy displayed six poster stations on various information regarding the EIS/OEIS. Subject Matter Experts (SME) were present to answer questions. From 7-9 pm a formal hearing was held and public comments were solicited. No speakers from the general public made presentations. Two people attended the open house, the hearing, or both. One written comment was received during the meeting. The following pages are scanned copies of the sign-in sheets, speaker cards, comment forms, and transcript of the formal hearing.

VACAPES Range Complex

Environmental Impact Statement/ Overseas Environmental Impact Statement

Public Hearing Attendance List – July 2008

Attendance List

Name Allen S. Forman	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☑ CD
Address 115 Acorn Ln	
City/State/Zip Point Harbor, NC 27964	
E-mail ———	
Organization/Constituency Represented (if any)	

Name	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address	
City/State/Zip	
E-mail	
Organization/Constituency Represented (if any)	

Name	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address	
City/State/Zip	
E-mail	
Organization/Constituency Represented (if any)	

Name	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address	
City/State/Zip	
E-mail	
Organization/Constituency Represented (if any)	

Date:________________

VACAPES Range Complex
Environmental Impact Statement/
Overseas Environmental Impact Statement
Public Hearing Attendance List – July 2008

Attendance List

Name Maria Dunn	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address 943 Washington Sq. Mall	
City/State/Zip Washington, NC 27889	
E-mail maria.dunn@ncwildlife.org	
Organization/Constituency Represented (if any) NCNRC	

Name	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address	
City/State/Zip	
E-mail	
Organization/Constituency Represented (if any)	

Name	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address	
City/State/Zip	
E-mail	
Organization/Constituency Represented (if any)	

Name	The full Final EIS/OEIS will be available on the web site and in repositories listed on the fact sheets. If you would like to receive a mailed electronic (CD) copy of the Final EIS/OEIS document, please check this box. ☐ CD
Address	
City/State/Zip	
E-mail	
Organization/Constituency Represented (if any)	

Date:____________________

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APPENDIX G

FEDERAL CONSISTENCY DETERMINATIONS

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The Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. 1451 "*et seq*".) was enacted to protect coastal resources from growing demands associated with commercial, residential, recreational and industrial uses. The CZMA allows coastal states to develop a Coastal Zone Management Plan (CZMP) whereby they designate permissible land and water use within the state's coastal zone. States then have the opportunity to review and comment on federal agency activities that could affect the state's coastal zone or its resources.

Federal agency activities potentially affecting a state's coastal zone must be consistent, to the maximum extent practicable, with the enforceable policies of the state's coastal management program. The enforceable policies of a state's coastal management program for purposes of federal consistency consist of management programs adopted by a coastal State in accordance with the provisions of sections 305 and 306, (16 U.S.C. 1454, 1455(d)) of the CZMA and approved by the Assistant Administrator for the Ocean Services and Coastal Zone Management, National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce. In addition, the enforceable policies of a State must be legally binding through constitutional provisions, laws, regulations, land use plans, ordinances or judicial or administrative decisions, by which a State exerts control over private and public land and water uses and natural resources in the coastal zone and which are incorporated in a management program as approved by the Office of Ocean and Coastal Resource Management, NOAA, either as part of the program approval described above or as a program change in accordance with the procedures detailed in 16 U.S.C. 1455(e). Typically, a state's CZMP will focus on the protection of physical, biological, and socioeconomic resources.

Review of federal agency activities is conducted through the submittal of either a Consistency Determination or a Negative Determination. A federal agency shall submit a Consistency Determination when it determines that its activity may have either a direct or an indirect effect on a state's coastal zone or resources. In accordance with 15 CFR 930.39, the consistency determination shall include a brief statement indicating whether the proposed activity will be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of the management program and should be based upon an evaluation of the relevant enforceable policies of the management program.

Pursuant to 15 CFR 930.41, the state has 60 days from the receipt of the Consistency Determination in which to concur with or object to the Consistency Determination, or to request an extension under 15 CFR 930.41(b). Federal agencies shall approve one request for an extension period of 15 days or less.

A federal agency may submit a Negative Determination to a coastal state when the federal agency has determined that its activities would not have an effect on the state's coastal zone or its resources or when conducting the same or similar activities for which Consistency Determinations have been prepared in the past. Pursuant to 15 CFR 930.35 the state has 60 days to review a federal agency's Negative Determination. States are not required to concur with a Negative Determination, and if the federal agency has not received a response from the state by the 60th day of submittal, it may proceed with its action. However, within the 60-day review period, a state agency may request, and the federal agency shall approve, one request for an extension period of 15 days or less.

In accordance with the CZMA, the U.S. Navy has reviewed the enforceable policies of each state's CZMP located within the Study Area. Based on the limitations discussed in Section 2.4, the enforceable policies of each state's CZMP, and pursuant to 15 CFR 930.39, the U.S. Navy prepared and submitted a Consistency Determination for the state of Virginia. Additionally, the

U.S. Navy prepared and submitted Negative Determinations pursuant to 15 CFR § 930.35 for the states of Delaware, Maryland and North Carolina. The status of these submissions is shown in Table G-1 as of March 3, 2009.

Table G-1 Status of CZMA Determination Submissions

State	Submission Type	Status
Virginia	Coastal Consistency Determination	Concurrence received March 2, 2009
Delaware	Negative Determination	No response received within the 60 day timeline, concurrence presumed
Maryland	Negative Determination	No response received within the 60 day timeline, concurrence presumed
North Carolina	Negative Determination	Concurrence received February 9, 2009

A copy of each CZMA determination letter is enclosed in this appendix, as well as any received State response.

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N4/7/1096
December 19, 2008

Ms. Ellie Irons
Department of Environmental Quality
629 East Main Street
Richmond, VA 23219

Dear Ms. Irons:

The U.S. Navy is proposing activities associated with U.S. Navy Atlantic Fleet training; research, development, testing, and evaluation (RDT&E); and associated range capabilities enhancements in the Virginia Capes (VACAPES) Range Complex. The purpose of the Proposed Action is to: 1) Achieve and maintain Fleet readiness using the VACAPES Range Complex to support and conduct current, emerging, and future training operations and RDT&E operations; 2) Expand warfare missions supported by the VACAPES Range Complex; and 3) Upgrade and modernize existing range capabilities to enhance and sustain U.S. Navy training and RDT&E.

Pursuant to Section 307 (c)(1), 16 United States Code (USC) 1456 of the Coastal Zone Management Act (CZMA) of 1972, as amended, we have determined that the Proposed Action will be conducted in a manner consistent with the enforceable policies of Virginia's approved coastal management program. The basis for this "Coastal Consistency Determination" is detailed in Enclosure (1) based on the enforceable policies in the Commonwealth's federally approved coastal management plan[1].

In addition, Enclosure (2) is a CD-Rom containing the VACAPES Draft Environmental Impact Statement (DEIS)/Overseas EIS (OEIS) and appendices which was published and released to the public for comment on June 27, 2008[2] in compliance with the National Environmental Policy Act and Executive Order 12114. The VACAPES DEIS/OEIS may be obtained by visiting the project's website: www.vacapesrangecomplexeis.com.

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[1] See CZMA section 304, 16 USC 1453 (6a). An enforceable policy is a state policy that is legally binding under state law, and by which a state exerts control over private and public coastal uses and resources, and which are incorporated in the state's federally approved coastal management plant. An enforceable policy is limited to a state's jurisdiction and must be given legal effect by state law and cannot apply to federal lands, federal waters, federal agencies or other areas or entities outside the state's jurisdiction, unless authorized by federal law.

[2] See Federal Register, Vol. 73, No. 125, Friday, June 27, 2008, pages 36498 to 36501.

5090
Ser N4/7/1096
December 19, 2008

Since the publication of the VACAPES DEIS/OEIS in the Summer of 2008, the U.S. Navy recently completed an informal consultation with the U.S. Fish and Wildlife Service (USFWS) on October 7, 2008, to address the proposed activities and its potential impact upon certain endangered and threatened species. The informal consultation with USFWS is documented in Enclosure (3).

In accordance with 15 Code of Federal Regulations (CFR) Section 930.32, the Department of the Navy has reviewed Virginia's coastal management program and associated enforceable policies and has determined that the proposed activities occurring within Virginia's coastal zone are consistent to the maximum extent practicable.

In accordance with 15 CFR Section 930.41(a), the Commonwealth of Virginia has 60 days from the receipt of this document in which to concur with or object to this Consistency Determination, or to request an extension under 15 CFR Section 930.41(b). Given the critical nature of this training, we are seeking your concurrence with our Consistency Determination. As a possible means to expedite this process, my staff is prepared to discuss this proposal in more detail and answer any questions you or your staff may have. Our point of contact is Ms. Erin Swiader, Naval Facilities Engineering Command, Atlantic, (757) 322-4960.

Virginia's concurrence will be presumed if its response is not received by the U.S. Navy (Atlantic Fleet) within 60 days from receipt of this Determination. Virginia's response or other inquiries should be sent to: Naval Facilities Engineering Command, Atlantic, Attn: Code EV22 (VACAPES EIS/OEIS Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278; or Facsimile (757) 322-4805. If additional information should be required, requests for such information should be requested within ten days of receipt of this Consistency Determination.

Sincerely,

J. W. MURPHY
Deputy Chief of Staff
for Operational Readiness
and Training

Enclosures: 1. Federal Agency CZMA Consistency Determination for Virginia
2. VACAPES DEIS/OEIS CD-Rom
3. USFWS Informal Consultation

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) CONSISTENCY DETERMINATION FOR VIRGINIA

INTRODUCTION

This document provides the Commonwealth of Virginia with the Department of the Navy's (U.S. Navy) Consistency Determination under the Coastal Zone Management Act (CZMA) 16 United States Code (USC) § 1456 Section 307 (c) (1) [or (2)] and 15 Code of Federal Regulations (CFR) § 930 (c), for training and testing activities in the Jacksonville (JAX) Range Complex. The information in this Consistency Determination is provided pursuant to 15 CFR § 930.39.

The Proposed Action of the Virginia Capes (VACAPES) Range Complex Environmental Impact Statement (EIS)/Overseas EIS (OEIS) has potential to affect Virginia's coastal zone resources as described in this CZMA Consistency Determination.

The following information is based upon review of the Virginia Coastal Resources Management Program (VCP), its enforceable policies, and information provided by the Virginia Department of Environmental Quality.

The Commonwealth of Virginia requires that federal agencies conduct a CZMA Consistency Determination for certain direct federal actions, federal permits and licenses, and federal assistance programs that occur within the State's designated coastal zone and have the potential to affect the State's coastal zone resources.

Virginia's coastal zone management area includes most of Tidewater Virginia, as defined by the Code of Virginia § 28.2100. In addition, the coastal zone includes coastal waters extending to 5.6 kilometers (3 nautical miles [nm]) into the Atlantic Ocean. The VACAPES Range Complex activities encompass direct federal activities that would take place inside the Commonwealth of Virginia's coastal zone and at the U.S. Navy's homeport in Norfolk, Virginia. Based on analysis in the EIS/OEIS, the scope of activities requires a CZMA Consistency Determination because the activities have the potential to impact coastal resources, in particular, endangered aquatic wildlife.

In accordance with Code of Virginia § 29.1-568, an enforceable policy of the VCP, the "*taking of any fish or wildlife species appearing on any list of threatened or endangered species published by the United States Secretary of the Interior pursuant to the provisions of the federal Endangered Species Act of 1973 (P.L. 93-205), or any modifications or amendments thereto, is prohibited except as provided in § 29.1-568.*" Therefore, because of the potential that training and testing activities in the VACAPES Range Complex could impact sea turtles and marine mammals, these activities must be consistent to the maximum extent practicable with the enforceable policies of the VCP.

The National Marine Fisheries Service (NMFS) is a cooperating agency for the VACAPES EIS/OEIS. In accordance with the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA), the U.S. Navy has analyzed the potential effects of the Proposed Action on threatened and endangered species, and non-listed marine mammals in consultation with NMFS.

Activities that have the Potential to Impact Virginia's Coastal Zone

The United States Department of the Navy (U.S. Navy) used a screening process to identify stressors to resources and issues evaluated in the EIS/OEIS. U.S. Navy subject matter experts studied the warfare areas and operations to identify specific activities that could act as stressors. Public and agency scoping comments, previous environmental analyses, previous agency consultations, laws, regulations, Executive Orders, and resource-specific information were also evaluated. Of the potential environmental stressors considered for the analysis of environmental consequences, the following stressors were carried forward for detailed analyses:

- Vessel movements
- Aircraft Overflights
- Towed Mine Warfare Devices
- Temporary mineshape deployment/recovery
- Non-explosive practice munitions
- Underwater detonations and high explosive ordnance
- Military expended material

Most of the activities addressed in this EIS/OEIS would be conducted in the offshore Operating Area (OPAREA), beginning at 3 nm from the coastline and extending seaward. Activities that would be conducted in the OPAREA include:

- Mine Warfare: Mine Countermeasures and Mine Neutralization;
- Surface Warfare: Missile Exercise (MISSILEX), Gunnery Exercise (GUNEX) (Air-to-Surface), GUNEX (Surface-to-Surface), Bombing Exercise (BOMBEX) (Air-to-Surface), and Laser Targeting;
- Air Warfare: Air Combat Maneuvers (ACM), Air Intercept Control, ACM Chaff Exercise, ACM Flare Exercise, MISSILEX (Air-to-Air), GUNEX (Surface-to-Air), and Detect to Engage;
- Strike Warfare: Firing Exercise;
- Electronic Combat: Electronic Combat Operations, Chaff Exercise; and
- Other Training: Shipboard Electronic Systems Evaluation Facility Utilization.
-

Additionally, the following activity would be conducted in the Lower Chesapeake Bay:

- Mine Warfare: Mine Countermeasures

None of the activities addressed in this EIS/OEIS would be conducted on land in Virginia. Specific details of the current and proposed operations conducted in the VACAPES Range Complex are presented in Chapter 2 of the EIS/OEIS (refer to the enclosed CD file in PDF format).

CONSISTENCY DETERMINATION

In accordance with 15 CFR § 930.39, the Department of the Navy has reviewed Virginia's coastal management program and associated enforceable policies and has determined that the U. S. Navy's Proposed Action is consistent to the maximum extent practicable with the enforceable policies of the VCP. The findings presented below are based on the analyses presented in Chapter 3, Affected Environment and Environmental Consequences of the VACAPES Range Complex EIS/OEIS.

PROPOSED FEDERAL AGENCY ACTION

The U.S. Navy has prepared an EIS/OEIS to assess potential environmental impacts in the VACAPES Range Complex over a 10-year planning horizon. The EIS/OEIS is expected to be completed in the Spring of 2009. The proposed activities evaluated in the EIS/OEIS are associated with U.S. Navy Atlantic Fleet training; research, development, testing, and evaluation (RDT&E) activities; and associated range capabilities enhancements, including infrastructure improvements (refer to Chapter 2 of the VACAPES EIS/OEIS for specific locations and descriptions of U.S. Navy operations: www.vacapesrangecomplexeis.com). The components of the VACAPES Range Complex include 28,672 square nautical miles (nm^2) of special use area warning area; 27,661 nm^2 of offshore surface and subsurface OPAREA; and 18,092 nm^2 of deep ocean area greater than 100 fathoms (600 feet). The Range Complex's western boundary begins at 3 nm from Delaware's shoreline (refer to the enclosed CD file in PDF format for Chapter 2 of the EIS/OEIS on specific locations in the range complex). The VACAPES Study Area also includes 420 nm^2 of the lower Chesapeake Bay.

The EIS/OEIS was prepared by the U.S. Navy in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 USC Section 4321); The Council on Environmental Quality regulations for implementing the procedural provisions of the NEPA (Title 40 CFR Parts 1500-1508); Department of the Navy procedures for implementing the NEPA (32 CFR 775); Executive Order (E.O.)12114,

Environmental Effects Abroad of Major Federal Actions; and Department of Defense regulations implementing E.O. 12114 (32 CFR Part 187). The Proposed Action requires analysis of potential impacts within and outside U.S. territory. Therefore, this document was written to satisfy the requirements of both the NEPA (for areas within the United States) and E.O. 12114.

In accordance with 50 CFR Part 401.12, the U.S. Navy has prepared a separate biological evaluation to assess the potential effects from the Proposed Action on marine resources and anadromous fish (which live in saltwater but spawn in freshwater) protected by NMFS under the ESA. In accordance with the MMPA (16 USC Section 1371[a][5]), the U.S. Navy has submitted a request for a letter of authorization to NMFS for the incidental taking of marine mammals by the Proposed Action. The U.S. Navy has prepared a separate Consultation Package in accordance with legal requirements set forth under regulations implementing Section 7 of the ESA (50 CFR 402; 16 U.S.C 1536 (c)) for listed species under jurisdiction of the U.S. Fish and Wildlife Service (USFWS). These documents are provided electronically in PDF format on the enclosed CD.

Proposed Action

The Proposed Action is to support and conduct current and emerging training and RDT&E operations in the VACAPES Range Complex. To achieve this, the U.S. Navy proposes to:

- Maintain training and RDT&E operations at current levels if the No Action Alternative is selected.

If either Alternative 1 or Alternative 2 is selected, then:

- Increase or modify training and RDT&E operations from current levels in support of the Fleet Response Training Plan (FRTP).
- Accommodate mission requirements associated with force structure changes, including those resulting from the introduction of new platforms (aircraft and weapons systems).
- Implement enhanced range complex capabilities.

The U.S. Navy's Preferred Alternative is Alternative 2, which includes implementation of Alternative 1 with additional increases in some operations, a reduction of at-sea bombing exercises with explosive munitions, and designation of additional mine warfare training areas within the VACAPES Study Area to provide additional support during training events. Under the Preferred Alternative, all components of the Proposed Action (for example, increases in training and RDT&E operations, force structure changes, and implementation of enhancement recommendations) would be achieved, based on the goal of meeting the purpose and need of the Proposed Action to the maximum extent possible by optimizing training to support future contingencies. The U.S. Navy is seeking concurrence on this consistency determination based on the Preferred Alternative.

Purpose and Need for Action

Operational requirements for deployment of naval forces world-wide drive and shape training doctrine and procedures. The nature of modern warfare and security operations has become increasingly complex. Navy training activities must focus on achieving proficiency in eight functional areas, known as Primary Mission Areas or, more commonly warfare areas: Air Warfare, Amphibious Warfare, Surface Warfare, Anti-submarine Warfare, Mine Warfare, Strike Warfare, Electronic Combat, and Naval Special Warfare. The EIS/OEIS addresses putting into practice the training strategies described in the FRTP to implement the Fleet Response Plan, to ensure continuous availability of agile, flexible, trained, and ready, surge-capable (rapid-response) forces.

The purpose of the Proposed Action is to:

- Achieve and maintain Fleet readiness using the VACAPES Range Complex to support and conduct current, emerging, and future training operations and RDT&E operations;

- Expand warfare missions supported by the VACAPES Range Complex; and
- Upgrade and modernize existing range capabilities to enhance and sustain U.S. Navy training and RDT&E.

The need for the Proposed Action is to provide range capabilities for training and equipping combat-capable naval forces ready to deploy worldwide. In this regard, the VACAPES Range Complex furthers the U.S. Navy's execution of its congressionally mandated roles and responsibilities under Title 10 USC Section 5062. To implement this Congressional mandate, the U.S. Navy needs to:

- Maintain current levels of military readiness by training in the VACAPES Range Complex.
- Accommodate future increases in operational training tempo in the VACAPES Range Complex and support the rapid deployment of naval units or strike groups.
- Achieve and sustain readiness of ships and squadrons so that the U.S. Navy can quickly surge significant combat power in the event of a national crisis or contingency operation, consistent with the FRTP.
- Support the acquisition and implementation into the Fleet of advanced military technology. The VACAPES Range Complex must adequately support the testing and training needed for new platforms (aircraft and weapons systems).
- Maintain the long-term viability of the VACAPES Range Complex while protecting human health and the environment, and enhancing the quality and communication capability and safety of the range complex.

Support to current, emerging, and future training and RDT&E operations, including implementation of range enhancements, entails the actions evaluated in this EIS/OEIS. These potentially include:

- Increasing the use of contractor-operated small aircraft that simulate enemy aircraft during training (commercial air services support for fleet opposition forces and electronic warfare threat training);
- Increasing anti-piracy and maritime interdiction training (anti-terrorism surface strike group training);
- Supporting MH-60R/S helicopter warfare mission areas; and
- Conducting realistic mine warfare training with mine shapes in designated areas using existing and new platforms.

FEDERAL CONSISTENCY REVIEW

Agency comments on the DEIS were reviewed for preparation of this consistency determination. Specific comments and responses that were considered are provided in the following paragraphs.

Regarding a recommendation that the U.S. Navy take all precautions to avoid shipwrecks in order to minimize, to the extent possible, the potential to impact important resources, the U.S. Navy is consulting with Virginia Department of Historic Resources regarding Section 106 of the National Historic Preservation Act.

Regarding a recommendation that the U.S. Navy coordinate with Virginia Department of Game and Inland Fisheries (VDGIF), NMFS, and USFWS regarding state and federally protected species, NMFS is a cooperating agency on the VACAPES EIS/OEIS. Therefore, close coordination has and continues to occur regarding protected marine species. In addition, the U.S. Navy has coordinated its proposed actions with the USFWS. The VDGIF received notice of the proposed actions and has provided the U.S. Navy with written comments.

Regarding a concern that the analysis for seabirds and migratory birds do not adequately cover coastal avian species in the lower Chesapeake Bay, and those that nest on the barrier islands and ocean-facing beaches directly adjacent to the Study Area, the U.S. Navy has reviewed these avian groups and determined those which may be encountered and impacted by U.S. Navy training.

Regarding a recommendation for a study to quantitatively determine the level of military expended materials (MEM) on *Sargassum* mats following a U.S. Navy exercise, the U.S. Navy used best available data the assessment of potential impacts of MEM on the environment. Regarding a concern that the DEIS lacks mitigation measures for seabirds, shorebirds, and other migratory and breeding species occurring in the VACAPES Study Area, mitigation measures such as avoidance of *Sargassum* mats would help to avoid and minimize potential impacts to birds. The analysis presented in the DEIS indicates that the Proposed Action would not result in significant impacts to birds.

Table 1 below addresses the enforceable policies of the VCP, which were considered in the consistency review and in the Proposed Action. The U.S. Navy has determined that the VACAPES Range Complex activities are consistent to the maximum extent practicable with the enforceable policies of the VCP based on the following information, data, and analysis (given as a summary in the table and presented as comprehensive analysis in Chapter 3 of the EIS/OEIS).

Pursuant to 15 CFR Section 930.41(a), the Commonwealth of Virginia has 60 days from the receipt of this letter in which to concur with or object to this Consistency Determination, or to request an extension under 15 CFR § 930.41(b). Given the critical nature of this training, the U.S. Navy seeks your concurrence with its Consistency Determination. Virginia's concurrence will be presumed if its response is not received by the U.S. Navy (Atlantic Fleet) within 60 days from receipt of this Determination. The Commonwealth's response should be sent to Naval Facilities Engineering Command, Atlantic, Attn: Code EV22 (VACAPES EIS/OEIS Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278. The VACAPES DEIS/OEIS may be downloaded by visiting the project's website: www.vacapesrangecomplexeis.com.

Table 1 Virginia Coastal Management Program Consistency Review

Enforceable Policies (Code of Virginia)	Consistency	Scope
§ 28.2-200 to § 28.2-713; § 29.1-100 to § 29.1-750; § 3.1-249.59 to § 3.1-249.62 *Fisheries Management*	The Proposed Action would not impact the management of fishery resources or involve the use of Tributylin.	Addresses conservation of fishery resources including finfish and shellfish and preservation of fisheries for food and recreation. Includes the Tributylin program to monitor boat activities and painting for compliance with regulations.
§ 28.2-1200 to § 28.2-1213 *Subaqueous Land Management*	The Proposed Action would not impact State-owned bottomlands. Furthermore, the Proposed Action would not impact the management of subaqueous lands.	Presents conditions to grant or deny permits to use State-owned bottomlands.
§ 28.2-1301 to § 28.2-1320; § 62.1-44.15.5 *Tidal and Non-tidal Wetlands Management*	The Proposed Action would take place in coastal and offshore waters. No terrestrial actions are associated with the activities. Therefore, wetlands would not be impacted.	Encompasses the tidal wetlands program and the Virginia Water Permit Protection Permit Program (tidal and non-tidal wetlands). The programs ensure wetland preservation and prevention from destruction.
§ 28.2-1400 to § 28.2-1420 *Dunes Management*	The Proposed Action would not impact dunes or dune management. No land activities would occur.	Prevents the destruction and alteration of primary dunes in accordance with the Coastal Primary Sand Dune Protection Act.
§ 10.1-560 *et.seq*. *Non-point Source Pollution Control*	No soil-disturbing projects would be initiated with the Proposed Action. U.S. Navy training occurs in coastal and offshore waters; activities do not include any construction.	Ensures that project designs reduce soil erosion and sediments and nutrients into rivers, bays, and waters.
§ 62.1-44.15 *Point Source Pollution Control*	The Proposed Action would not result in significant pollutant discharges. The U.S. Navy follows the standards for incidental liquid discharges from vessels of the Armed Forces, effective 9 June 1999. An NPDES permit is not required for the Proposed Action.	Implements the Virginia Pollutant Discharge Elimination System permit program, the State's National Pollutant Discharge Elimination System (NPDES) program pursuant to Section 402 of the Clean Water Act.
§ 32.1-164 through § 32.1-165 *Shoreline Sanitation*	The Proposed Action would not impact shoreline sanitation and does not include any construction or installation activities.	Regulates septic tank installation including suitable soil types and minimum distances from water bodies.

Enforceable Policies (Code of Virginia)	Consistency	Scope
§ 10-1.1300 *Air Pollution Control*	The Proposed Action would not result in significant adverse impacts to air quality. Most emissions would occur above 3,000 feet and are considered to be above the atmospheric inversion layer; therefore, without impact on the local air quality. Based on the EIS/OEIS analysis it was determined that the Clean Air Act general conformity Rule does not apply for the Proposed Action.	Provides the enforceable State Implementation Plan for maintenance and attainment of the National Ambient Air Quality Standards pursuant to the Federal Clean Air Act.
§ 10.1-2100 through § 10.1-2114; 9 VAC 10-20-10 *et seq.* *Coastal Lands Management*	The act and its regulations apply to local governments. Furthermore, the Proposed Federal Action will not impact the water quality and economic resources of the Chesapeake Bay.	Implements the Chesapeake Bay Preservation Act and the Chesapeake Bay Preservation Area Designation and Management Regulations.

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
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TDD (804) 698-4021
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L. Preston Bryant, Jr.
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

February 25, 2009

Naval Facilities Engineering Command, Atlantic
Attn: Code EV22 (VACAPES EIS/OEIS Project Manager)
6506 Hampton Boulevard
Norfolk, Virginia 23508-1278

RE: Federal Consistency Determination for the Atlantic Fleet Training, Research, Development, Testing and Evaluation in the Virginia Capes Range Complex, U.S. Navy, DEQ 09-003F.

Dear Project Manager:

The Commonwealth of Virginia has completed its review of the Federal Consistency Determination (FCD) for the above-referenced project. The Department of Environmental Quality (DEQ) is responsible for coordinating Virginia's review of Federal Consistency Determinations and responding to appropriate officials on behalf of the Commonwealth. This letter is in response to your submission dated December 19, 2008 (received on January 5, 2009) requesting concurrence with the Federal Consistency Determination prepared by the Department of the Navy. The following agencies and planning district commission participated in this review:

Department of Environmental Quality
Virginia Marine Resources Commission
Department of Game and Inland Fisheries
Department of Conservation and Recreation
Department of Mines, Minerals and Energy
Department of Historic Resources
Department of Aviation
Hampton Roads Planning District Commission

The Virginia Institute of Marine Science, Virginia Coastal Energy Research Consortium and Accomack-Northampton Planning District Commission were also invited to participate in the review.

Public notice of this proposed action was published on the DEQ web site from January 9, 2009 through February 3, 2009. No public comments were received in response to the notice.

PROJECT DESCRIPTION

The Department of the Navy (Navy) proposes to conduct Atlantic fleet training and research, development, testing and evaluation (RDTE) activities in the Virginia Capes (VACAPES) Range Complex off the Virginia Coast. Activities include:

- Mine Warfare (MIW), including mine countermeasures and mine neutralization;
- Surface Warfare (SUW), including missile exercise (MISSILEX) (air-to-surface), gunnery exercise (GUNEX) (air-to-surface), GUNEX (surface-to-surface), bombing exercise (BOMBEX), and laser targeting;
- Air Warfare (AW), including air combat maneuvers (ACM), air intercept control, MISSILEX (air-to-air and surface-to-air), detect to engage, and GUNEX (air-to-air and surface-to-air);
- Strike Warfare (STW), including High-speed Anti-radiation Missile (HARM) exercises and GUNEX (air-to-surface);
- Electronic Combat (EC), including electronic combat operations, chaff exercise, and flare exercise (aircraft self-defense);
- Amphibious Warfare (AMW), including firing exercises (FIREX) with Integrated Maritime Portable Acoustic Scoring and Simulator System (IMPASS); and
- Test and Evaluations, including Shipboard Electronic Systems Evaluation Facility (SESEF) utilization.

The proposed actions also include associated range capabilities enhancements and infrastructure improvements including additional mine warfare training areas to be established in the lower Chesapeake Bay. Non-explosive mine shapes would be deployed in these areas to simulate a threat minefield.

The geographic scope of the VACAPES Range Complex includes the airspace, seaspace and undersea space. The components of the VACAPES Range Complex include:

- 28,672 square nautical miles (nm^2) of special use area (SUA) warning area;
- 27,661 nm^2 of offshore surface and subsurface operating area (OPAREA); and
- 18,092 nm^2 of deep ocean area greater than 100 fathoms (600 feet).

The VACAPES Study Area does not include any dry land. However, it does include the area from the mean high tide line east (seaward) to the 3-nautical mile boundary of Virginia waters. The VACAPES Study Area also includes 420 nm^2 of the lower Chesapeake Bay, where proposed Mine Warfare (MIW) training would occur. A draft Environmental Impact Statement/Overseas Environmental Impact Statement

(DEIS/OEIS) was previously submitted by the Navy for the proposal and was reviewed by the Commonwealth in 2008 (DEQ #08-144F).

FEDERAL CONSISTENCY ANALYSIS

Pursuant to the Coastal Zone Management Act of 1972, as amended, federal actions that can have reasonably foreseeable effects on Virginia's coastal uses or resources must be conducted in a manner which is consistent, to the maximum extent practicable, with the Virginia Coastal Resources Management Program (VCP). The Virginia Coastal Resources Management Program is comprised of a network of programs administered by several agencies. In order to be consistent with the VCP, the federal agency must obtain all the applicable permits and approvals listed under the Enforceable Policies of the VCP prior to commencing the project.

According to information in the consistency determination, the proposed activity would have no effect on the following enforceable policies: fisheries management; subaqueous lands management; wetlands management; dunes management; nonpoint source pollution control; point source pollution control; shoreline sanitation; and coastal lands management. The agencies of the Commonwealth that are responsible for the administration of enforceable policies of the VCP agree with the Navy's determination. The Navy must ensure that the proposed action is consistent with the aforementioned policies. The analysis which follows responds to the Navy's discussion of the enforceable policies of the VCP that apply to this project and review comments submitted by agencies that administer the enforceable policies.

FEDERAL CONSISTENCY CONCURRENCE

Based on our review of the Navy's consistency determination and the comments submitted by agencies administering the enforceable policies of the VCP, DEQ concurs that the proposal is consistent with the VCP provided all applicable permits and approvals are obtained as described below. However, other state approvals which may apply to this project are not included in this consistency concurrence. Therefore, the Navy must ensure that this project is constructed and operated in accordance with all applicable federal, state, and local laws and regulations.

1. Air Pollution Control. According to the FCD (page 7), the proposed action would not result in significant adverse impacts to air quality. Most emissions would occur above 3,000 feet and are considered to be above the atmospheric inversion layer; therefore, activities would not have an impact on the local air quality. The document concludes that the Clean Air Act general conformity rule does not apply to the proposed action.

1(a) Agency Jurisdiction. DEQ's Air Quality Division, on behalf of the State Air Pollution Control Board, is responsible to develop regulations that become Virginia's Air Pollution Control Law. DEQ is charged to carry out mandates of the state law and related regulations as well as Virginia's federal obligations under the *Clean Air Act* as

amended in 1990. The objective is to protect and enhance public health and quality of life through control and mitigation of air pollution. The division ensures the safety and quality of air in Virginia by monitoring and analyzing air quality data, regulating sources of air pollution, and working with local, state and federal agencies to plan and implement strategies to protect Virginia's air quality. The appropriate regional office is directly responsible for the issue of necessary permits to construct and operate all stationary sources in the region as well as to monitor emissions from these sources for compliance. As a part of this mandate, the environmental documents of new projects to be undertaken in the state are also reviewed. In the case of certain projects, additional evaluation and demonstration must be made under the general conformity provisions of state and federal law.

1(b) Ozone Maintenance Area. According to the DEQ Air Division, the project area is partly located in an ozone (O_3) maintenance area and an emission control area for the contributors to ozone pollution, which are VOCs and NO_x. Therefore, the Navy should take all reasonable precautions to limit emissions of VOCs and NO_x, principally by controlling or limiting the burning of fossil fuels.

For further information, contact Kotur Narasimhan, DEQ at (804) 698-4415

ADDITIONAL ENVIRONMENTAL CONSIDERATIONS

In addition to the enforceable policies of the VCP, comments were also provided with respect to applicable requirements and recommendations of the programs that follow.

1. Wildlife Resources and Protected Species.

1(a) Agency Jurisdiction. The Department of Game and Inland Fisheries (DGIF), as the Commonwealth's wildlife and freshwater fish management agency, exercises enforcement and regulatory jurisdiction over wildlife and freshwater fish, including state or federally listed endangered or threatened species, but excluding listed insects (*Virginia Code* Title 29.1). The DGIF is a consulting agency under the *U.S. Fish and Wildlife Coordination Act* (16 U.S.C. sections 661 et seq.), and provides environmental analysis of projects or permit applications coordinated through DEQ and several other state and federal agencies. DGIF determines likely impacts upon fish and wildlife resources and habitat, and recommends appropriate measures to avoid, reduce, or compensate for those impacts.

1(b) Agency Comments. The following section summarizes comments submitted by DGIF in response to the Navy's 2008 DEIS/OEIS, and resubmitted by DGIF for the federal consistency determination review. The complete text of DGIF comments is attached.

Marine Mammals

Harbor seal, harp seal, and gray seal occurrences in the inshore and nearshore waters of the mid-Atlantic region are becoming more frequent in the fall and winter months (Virginia Aquarium Stranding Response Program).

Sea Turtles

Green sea turtles nest on beaches adjacent to the VACAPES complex (i.e. northern outer banks of North Carolina and one documented nest reported in Virginia Beach in 2005).

Leatherback nesting has been documented on the Outer Banks and has been increasing in the state over the last decade (North Carolina Wildlife Resources Commission).

Recent data presented in the Loggerhead sea turtle 5-year review, summary and evaluation suggests that three of the four U.S. loggerhead nesting subpopulations (i.e. South Florida, Florida Panhandle and Northern nesting subpopulations) are decreasing. DGIF can provide the Navy with information regarding sea turtle documentations from Virginia.

Seabirds and Migratory Birds

In Virginia, coastal avian species that nest on the barrier islands and ocean-facing beaches directly adjacent to the VACAPES area include the following:

- piping plover (federal-listed threatened);
- Wilson's plover (state-listed endangered);
- American oystercatcher (ranked nationally as a high conservation priority species according to the U.S. Shorebird Conservation Plan); and
- black skimmer.

All of the species are migratory and may occur within the VACAPES complex before, during and after the breeding season which extends from April through September. Some of the seabirds breed on beaches adjacent to the VACAPES study area and may forage in federal waters (i.e., beyond the 3 nm state line). Numerous species of shorebirds including the red knot, a candidate species for federal listing, are likely to occur in the study area, as are migrating and wintering sea ducks. Migratory landbirds are likely to select nearshore and offshore pathways.

Mine warfare training in the lower Chesapeake Bay, which entails low flying helicopters towing mine detecting equipment, has the potential to adversely impact breeding shorebirds, wading birds, waterfowl, rails and seabirds that nest in the marshes and beaches along the eastern and western shores of the lower Chesapeake during the

months of April through August, including the potential effects of these activities on the large numbers of sea ducks and sea birds (e.g., gulls, gannets, terns) that winter in the lower Chesapeake Bay.

Mitigation Measures

The mitigation measures for most training exercises are largely comprised of maintaining lookouts or watchstanders to look for marine mammals, sea turtles, rafts of sargassum grass and other indicators of biological activity in the buffer zones or zones of impact. Depending on the type of exercise and the organism, habitat, or activity observed, the Navy would take measures to avoid or minimize the potential for disturbance, injury or death. Most mitigation measures rely entirely on the observers' ability to detect sea turtles, marine mammals, and indicators of their presence such as sargassum grass under all conditions (e.g., high seas, after dark, storms, etc.).

DGIF supports the Navy's Integrated Comprehensive Monitoring Program (ICMP) that would incorporate state of the art monitoring technologies designed specifically for marine species.

2(c) Recommendations. DGIF recommends that the Navy perform the following actions related to activities conducted in the VACAPES Range Complex:

- monitor bird, sea turtle and marine mammal occurrences (or takes) observed during training operations;
- monitor the level of chaff in sargassum grass following current training operations using chaff and the impacts of this on sea turtles and their hatchlings and birds, as well as other species that may use these grass mats for cover and foraging;
- be aware of potential disturbances and impacts of low flying helicopters towing mine detecting equipment upon seabirds and migratory birds from mine warfare training;
- be cognizant of the increases in harbor seal, harp seal, and gray seal occurrences in the inshore and nearshore waters of the mid-Atlantic region in the marine mammal section;
- conduct training and develop procedures for lookouts and watchstanders to more effectively avoid potential impacts upon marine mammals and turtles; and
- implement the Navy's Integrated Comprehensive Monitoring Program.

Contact Amy Ewing, DGIF at (804) 367-2211, for additional information regarding these comments.

3. Natural Heritage Resources.

3(a) Agency Jurisdiction The mission of the Virginia Department of Conservation and Recreation is to conserve Virginia's natural and recreational resources. DCR supports a variety of environmental programs organized within seven divisions including the

Division of Natural Heritage. The Natural Heritage Program's (DCR-DNH) mission is conserving Virginia's biodiversity through inventory, protection, and stewardship. The *Virginia Natural Area Preserves Act*, 10.1-209 through 217 of the *Code of Virginia*, was passed in 1989 and codified DCR's powers and duties related to statewide biological inventory: maintaining a statewide database for conservation planning and project review, land protection for the conservation of biodiversity, and the protection and ecological management of natural heritage resources (the habitats of rare, threatened, and endangered species, significant natural communities, geologic sites, and other natural features).

3(b) Agency Comments. DCR-DNH searched its Biotics Data System for occurrences of natural heritage resources in the project area. According to the information in DCR files, several state and federally-listed sea turtles, whales and marine mammals are located in the project vicinity and may be affected by the proposed activity.

3(c) State-listed Plant and Insect Species. The *Endangered Plant and Insect Species Act of 1979*, Chapter 39 §3.1-1020 through 1030 of the *Code of Virginia*, as amended, authorizes the Virginia Department of Agriculture and Consumer Services (VDACS) to conserve, protect, and manage endangered and threatened species of plants and insects. The VDACS Virginia Endangered Plant and Insect Species Program personnel cooperates with the U.S. Fish and Wildlife Service (USFWS), DCR-DNH and other agencies and organizations on the recovery, protection or conservation of listed threatened or endangered species and designated plant and insect species that are rare throughout their worldwide ranges. In those instances where recovery plans, developed by USFWS, are available, adherence to the order and tasks outlined in the plans are followed to the extent possible.

Under a Memorandum of Agreement established between VDACS and DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. DCR finds that the current activity will not affect any documented State-listed plants or insects.

3(d) State Natural Area Preserves. DCR files indicate the presence of the Parramore Island State Natural Area Preserve under DCR's jurisdiction in the project vicinity.

3(e) Recommendations. Due to the legal status of species documented to be present in the project area, DCR recommends coordination with the Virginia Department of Game and Inland Fisheries (DGIF), the USFWS and the National Marine Fisheries Service (NMFS) for information regarding the possible impacts to these protected species and to ensure compliance with protected species legislation.

Contact DCR-DNH, Rene Hypes at (804) 371-2708 for an update on natural heritage information if a significant amount of time passes before the proposed activities are initiated since new and updated information is continually added to Biotics.

4. Offshore Energy Resources.

4(a) Agency Jurisdiction. The mission of the Department of Mines, Minerals and Energy (DMME), Division of Mineral Resources (DMR) is to enhance the development and conservation of energy and mineral resources in a safe and environmentally sound manner to support a more productive economy in Virginia. Serving as Virginia's geological survey, DMME-DMR generates, collects, compiles, and evaluates geologic data, creates and publishes geologic maps and reports, works cooperatively with other state and federal agencies, and is the primary source of information on geology, mineral and energy resources, and geologic hazards for both the mineral and energy industries and the general public. DMME-DMR also provides the necessary geologic support for those divisions of DMME that regulate the permitting of new mineral and fuel extraction sites, miner safety, and land reclamation.

4(b) Agency Comments. According to DMME-DMR, provided permanent offshore structures are not being constructed and the planned activities can co-exist with future gas and mineral exploration and development, and/or offshore alternative energy generation facilities, significant impacts to energy or mineral resources is not anticipated.

For additional information, contact Matt Heller, DMME at (434) 951-6351.

5. Historic Structures and Archaeological Resources.

5(a) Agency Jurisdiction. The Department of Historic Resources (DHR) conducts reviews of projects to determine their effect on historic structures or cultural resources under its jurisdiction. DHR, as the designated State's Historic Preservation Office, ensures that federal actions comply with Section 106 of the *National Historic Preservation Act of 1966* (*NHPA*), as amended, and its implementing regulation at 36 CFR Part 800. The *NHPA* requires federal agencies to consider the effects of federal activities on properties that are listed or eligible for listing on the National Register of Historic Places. Section 106 also applies if there are any federal involvements, such as licenses, permits, approvals or funding.

5(b) Agency Comments. DHR requests that the Navy continue to consult with DHR directly pursuant to Section 106 of the *NHPA* (as amended) and its implementing regulations codified at 36 CFR Part 800, which require federal agencies to consider the effects of their undertakings on historic properties.

For additional information and coordination, contact Roger Kirchen, DHR at (804) 367-2323, ext. 153.

6. Aviation Impacts.

6(a) Agency Jurisdiction. The Virginia Department of Aviation's Airport Services Division provides airport sponsors and managers with technical assistance on a wide

range of projects and issues, including the planning, design, construction and maintenance of airport facilities. The division manages funding programs for capital improvements, facilities and equipment, airport maintenance projects, and airport security; the General Aviation Voluntary Security Certification Program; the licensing program for public-use airports; and the registration program for private-use airports. This division conducts statewide aviation system planning and maintains the Virginia Air Transportation System Plan.

6(b) Agency Comments. The Department of Aviation reviewed the FCD and does not anticipate that proposed activities would result in adverse impacts to aviation.

For additional information, contact Rusty Harrington, DoAv at (804) 236-3624.

7. Regional Planning Area.

7(a) Agency Jurisdiction. In accordance with the Code of Virginia, Section 15.2-4207, planning district commissions encourage and facilitate local government cooperation and state-local cooperation in addressing, on a regional basis, problems of greater than local significance. The cooperation resulting from this is intended to facilitate the recognition and analysis of regional opportunities and take account of regional influences in planning and implementing public policies and services. Planning district commissions promote the orderly and efficient development of the physical, social and economic elements of the districts by planning, and encouraging and assisting localities to plan, for the future.

7(b) Agency Comments. The staff of the Hampton Roads Planning District Commission (HRPDC) reviewed the consistency determination for the proposed action. According to HRPDC, the proposal is generally consistent with local and regional plans and policies.

For additional information contact Dwight Farmer, HRPDC at (757) 420-8300.

Thank you for the opportunity to comment on this FCD. The detailed comments from reviewers are attached for your use. If you have questions, please do not hesitate to call me at (804) 698-4325 or John Fisher at (804) 698-4339.

Sincerely,

Ellie Irons, Manager
Office of Environmental Impact Review

Enclosures

cc: Michelle Hollis, DEQ-TRO

Paul Kohler, DEQ-ORP
Tony Watkinson, VMRC
Amy Ewing, DGIF
Matt Heller, DMME
Ethel Eaton, DHR
Pam Mason, VIMS
George Hagerman, VCERC
R.N. Rusty Harrington, DoAv
Paul Berge, Accomack-Northampton PDC
Dwight Farmer, Hampton Roads PDC

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR PROGRAM COORDINATION

ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY

TO: John E. Fisher **DEQ - OEIA PROJECT NUMBER: 09 – 003F** RECEIVED

PROJECT TYPE: ☐ STATE EA / EIR **X FEDERAL EA / EIS** ☐ SCC

X CONSISTENCY DETERMINATION

PROJECT TITLE: ATLANTIC FLEET TRAINING, RESEARCH, DEVELOPMENT, TESTING, & EVALUATION IN THE VIRGINIA CAPES RANGE COMPLEX

PROJECT SPONSOR: U. S. DEPARTMENT OF DEFENSE / U. S. NAVY

PROJECT LOCATION: **X OZONE MAINTENANCE AREA**

REGULATORY REQUIREMENTSMAY BE APPLICABLE TO: ☐ CONSTRUCTION
X OPERATION

STATE AIR POLLUTION CONTROL BOARD REGULATIONS THAT MAY APPLY:

1. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 E – STAGE I
2. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 F – STAGE II Vapor Recovery
3. ☐ 9 VAC 5-40-5490 et seq. – Asphalt Paving operations
4. **X 9 VAC 5-40-5600 et seq. – Open Burning**
5. **X 9 VAC 5-50-60 et seq. Fugitive Dust Emissions**
6. ☐ 9 VAC 5-50-130 et seq. - Odorous Emissions; Applicable to_____
7. ☐ 9 VAC 5-50-160 et seq. – Standards of Performance for Toxic Pollutants
8. ☐ 9 VAC 5-50-400 Subpart_____, Standards of Performance for New Stationary Sources, designates standards of performance for the_____
9. ☐ 9 VAC 5-80-10 et seq. of the regulations – Permits for Stationary Sources
10. ☐ 9 VAC 5-80-1700 et seq. Of the regulations – Major or Modified Sources located in PSD areas. This rule may be applicable to the _____
11. ☐ 9 VAC 5-80-2000 et seq. of the regulations – New and modified sources located in non-attainment areas
12. ☐ 9 VAC 5-80-800 et seq. Of the regulations – Operating Permits and exemptions. This rule may be applicable to _____

COMMENTS SPECIFIC TO THE PROJECT:

Being in an area of ozone maintenance, all precautions are necessary to restrict the emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO_X) while carrying out land based activities.

_____

(Kotur S. Narasimhan)
Office of Air Data Analysis

DATE: January 30, 2009

Fisher,John

From: Aschenbach, Ernie (DGIF)
Sent: Tuesday, February 24, 2009 6:05 PM
To: Fisher,John
Cc: Aschenbach, Ernie (DGIF)
Subject: Federal Consistency Determination (FCD); ESSLOG#23238; 25463; DEQ#: 08-144F; 09-003F

Attachments: Document.pdf

Document.pdf (835 KB)

According to our records, we have previously reviewed the National Environmental Policy Act (NEPA) document for the above-referenced project and have provided comments (attached).

We have also reviewed the subsequent Federal Consistency Determination (FCD). The FCD acknowledges the Navy's receipt of DGIF's comments. According to the FCD, the Navy has reviewed potential impact to coastal avian species in the lower Chesapeake Bay, those that nest on barrier islands and ocean-facing beaches directly adjacent to the Study Area. We reiterate our original concerns regarding potential impacts to avian species.

According to FCD, the project would not impact the management of fishery resources or involve the use of Tributylin, and is therefore consistent with the Fisheries Management enforceable policy of the Coastal Zone Management Act (CZMA). Based on this information, we find this project consistent with the Fisheries Management enforceable policy of the CZMA.

Thank you for the opportunity to provide comments.

Ernie Aschenbach
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries 4010 West Broad Street
Richmond, VA 23230
Phone: (804) 367-2733
FAX: (804) 367-2427
Email: Ernie.Aschenbach@dgif.virginia.gov

Attachment.

-----Original Message-----
From: Aschenbach, Ernie
Sent: Monday, February 09, 2009 4:08 PM
To: Fisher, John (DEQ)
Cc: Aschenbach, Ernie
Subject: FW: ESSLOG#23238; 25463; DEQ#: 08-144F; 09-003F

According to our records, we have previously reviewed the above-referenced project. Provided the project scope remains the same, our existing comments (attached) remain valid.

Thank you for the opportunity to provide comments.

Ernie Aschenbach
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries 4010 West Broad Street
Richmond, VA 23230
Phone: (804) 367-2733
FAX: (804) 367-2427

ESSLog#: 23238; 25463

Ewing, Amy

From: Ewing, Amy
Sent: Thursday, August 07, 2008 5:01 PM
To: Fisher, John (DEQ)
Cc: Boettcher, Ruth
Subject: ESSLog# 23238_08-144F_VACAPES

23238_012307_VACAPES_DEIS.doc ...

John, please let me know if you are able to incorporate these into the DEQ response or if we need to send these separately to the Navy. Thanks for your patience! Amy

We have reviewed the draft EIS for the subject project. This project proposes several alternatives for testing and training activities in in the Virginia Capes Range Complex located in the southern Chesapeake Bay and Atlantic Ocean. The no action alternative maintains current training operations and levels. Alternative 1 maintains current training operations and increases operational training, expands warfare missions and accommodates for force structure changes. Alternative 2, the preferred alternative includes all operations in Alternative 1 plus additional mine warfare training, establishment of mine warfare training areas with small fields of mine shapes, and implements additional enhancements to meet future training requirements.

We submitted the attached comments to the Navy during their scoping for the EIS in 2007. Overall, we feel that many of the recommended topics of discussion were covered in the draft EIS. However, we still have some concerns, as detailed below, and recommend further considering the attached comments and the sources for information provided within.

General Comments:

The seabird and migratory section of the DEIS makes no mention of coastal avian species that nest on the barrier islands and ocean facing beaches directly adjacent to the VACAPES study area. In Virginia, these species include the Federally Threatened piping plover, State Endangered Wilson's plover, American oystercatcher, which is ranked nationally as a high conservation priority species according to the U.S. Shorebird Conservation Plan, and black skimmer. All of the species are migratory and may occur within the VACAPES complex before, during and after the breeding season which extends from April - September. Moreover, some of the seabirds listed in Table 3.10-2 breed on beaches adjacent to the VACAPES study area and may forage in federal waters (i.e., beyond the 3 nm state line). In addition, numerous species of shorebirds including the red knot, a candidate species for federal listing, are likely to occur in the study area, as are migrating and wintering sea ducks. Lastly, the DEIS does not address the possibility of migratory landbirds that likely select nearshore and offshore pathways.

The DEIS does not include any mention of bird, sea turtle, and marine mammal occurrences (or takes) observed during past training operations within VACAPES. If such information exists, we recommend it be included in the EIS.

The discussion on impacts of expended materials including chaff fibers, end caps, and pistons which may concentrate in sargassum grass rafts and convergence zones where sea turtle hatchlings occur and seabirds forage, respectively, is highly speculative. We recommend that an effort be made to measure the level of chaff in sargassum grass following current training operations using chaff and the impacts of this on sea turtles and their hatchlings and birds, as well as other species that may use these grass amts for cover and foraging.

The DEIS section on seabirds and migratory birds does not address potential disturbance that mine warfare training in the lower Chesapeake Bay, which entails low flying helicopters towing mine detecting equipment, may have on breeding shorebirds, wading

birds, waterfowl, rails, and seabirds that nest in the marshes and beaches along the eastern and western shores of the lower Chesapeake during the months of April – August. Nor did it discuss potential effects of these activities on the large numbers of sea ducks and sea birds (e.g., gulls, gannets, terns) that winter in the lower Chesapeake Bay. We recommend that the DEIS discuss potential disturbances and impacts upon these species occurring from mine warfare training.

Any increase in activity over that which currently takes place (as described in the No Action Alternative) is likely to result in an increase in impacts upon the waters of the project area and the species that inhabit these waters. We recommend that any discussion about cumulative impacts consider the magnitude of the increase in impacts with the addition of each activity.

We recommend continued coordination with the USFWS regarding possible impacts upon federally listed species and with our agency regarding impacts upon federal and state-listed species. Ruth Boettcher, VDGIF Eastern Shore Biologist, may be contacted at 757-787-5911 with any questions or to request data or information regarding the species and resources mentioned above.

Chapter 3 - Affected Environment

3.7 - Marine Mammals:
Harbor seal, harp seal, and gray seal occurrences in the inshore and nearshore waters of the mid-Atlantic region are becoming more frequent in the fall and winter months (VA Aquarium Stranding Response Program, pers. comm.). We recommend inclusion of this, along with any necessary discussion, in the marine mammal section.

3.8 - Sea Turtles
Green sea turtles do nest on beaches adjacent to the VACAPES complex (i.e., northern outer banks of North Carolina; one documented nest reported in VA Beach in 2005).

Leatherback nesting has been documented on the Outer Banks of NC and has been increasing in the state over the last decade (M. Godfrey, NC Wildlife Resources Commission, pers. comm).

The section on sea turtle density estimates should be recalculated using more recent data on sea turtle surfacing times, behavior and detectability rates that can be found in:
Mansfield, K. L. 2006. Sources of mortality, movements, and behavior of sea turtles in Virginia. Ph.D. diss. The College of William and Mary, VA. Pp. 343.

Recent data presented in the Loggerhead sea turtle 5 year review: summary and evaluation suggests that three of the four US loggerhead nesting subpopulations (i.e., South Florida, Florida Panhandle and Northern nesting subpopulations) are decreasing.

We would be happy to provide the Navy with information regarding sea turtle documentations from Virginia.

3.10 - Seabirds and Migratory Birds
Many of the seabird occurrence periods listed in Table 3.10-2 are incorrect. We would be happy to provide supportive data and recommended occurrence dates for inclusion in this table.

Again, we re-iterate that there is no mention in the DEIS about the occurrence of or impacts upon Federally Threatened piping plover, State Endangered Wilson's plover, American oystercatcher, which is ranked nationally as a high conservation priority species according to the U.S. Shorebird Conservation Plan, and black skimmer. We recommend further consideration of these species and the possible impacts upon them.

Chapter 5 - Mitigation

Mitigation measures for most training exercises are largely comprised of maintaining lookouts or watchstanders to look for marine mammals, sea turtles, rafts of sargassum grass and other indicators of biological activity in the buffer zones or zones of impact. Depending on the type of exercise and the organism/habitat/activity observed, measures will be taken to avoid or minimize the potential for disturbance, injury or death. As such, most mitigation measures rely entirely on the observers' ability to detect sea

turtles, marine mammals, and indicators of their presence such as sargassum grass under all conditions (e.g., high seas, after dark, storms, etc.). The DEIS does not include an assessment of the detection probabilities on the part of lookouts in any and all conditions, which makes it difficult to quantify overall impacts on these species. We recommend some discussion about the effectiveness of lookouts and watchstanders and their ability to assist in avoidance of impacts upon marine mammals and turtles. We recommend some discussion about training for such lookouts and the procedures they are to follow.

The DEIS lacks any mitigation measures for seabirds, shorebirds and other migratory and breeding species occurring within the VACAPES study area and which are likely to be adversely impacted by this project.

VDGIF commends the Navy for its development of an Integrated Comprehensive Monitoring Program (ICMP) that may incorporate state of the art monitoring technologies designed specifically for marine species. In order to fully understand the Navy's future commitment towards adequately minimizing impacts on these species, we request that the final ICMP be included in the EIS, if possible.

Thank you.

Amy M. Ewing
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries 4010 West Broad Street
Richmond, VA 23230
804-367-2211
amy.ewing@dgif.virginia.gov

L. Preston Bryant, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

203 Governor Street
Richmond, Virginia 23219-2010
(804) 786-6124

MEMORANDUM

DATE: February 3, 2009

TO: John Fisher, DEQ

FROM: Robert S. Munson, Planning Bureau Manager, DCR-DPRR

SUBJECT: DEQ 09-003F: US DOD/US Navy – Atlantic Fleet Training, Research, Development, Testing & Evaluation in the Va Capes Range Complex, Tidewater Area

Division of Natural Heritage

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

DCR reiterates comments from July 2008:

"According to the information in our files, several state and federally-listed sea turtles, whales and marine mammals are located in the project vicinity and may be affected by the proposed activity. Due to the legal status of these species, DCR recommends coordination with the Virginia Department of Game and Inland Fisheries (VDGIF), the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) for information regarding the possible impacts to these protected species and to ensure compliance with protected species legislation.

Under a Memorandum of Agreement, DCR represents the Virginia Department of Agriculture and Consumer Services (VDACS) in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

In addition, our files indicate the presence of the Parramore Island State Natural Area Preserve under DCR's jurisdiction in the project vicinity."

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters, that may contain information not documented in this letter. Their database may be accessed from www.dgif.virginia.gov/wildlifeinfo_map/index.html, or contact Shirl Dressler at (804) 367-6913.

The remaining DCR divisions have no comments regarding the scope of this project. Thank you for the opportunity to comment.

Cc: Ernie Aschenbach, VDGIF
Tylan Dean, USFWS
Ken Hollingshead, NMFS
Dot Field, DCR-NH – Eastern Shore Regional Steward

COMMONWEALTH OF VIRGINIA
Department of Mines, Minerals and Energy
Division of Mineral Resources
Fontaine Research Park
900 Natural Resources Drive, Suite 500
Charlottesville, Virginia 22903-0307
(434) 951-6341
www.dmme.virginia.gov

February 2, 2008

Virginia Department of Environmental Quality
Office of Environmental Impact Review
629 East Main Street, Sixth Floor
Richmond, Virginia 23219
Attention: John Fisher

Re: Atlantic Fleet Training, Research, Development, Testing, and Evaluation in the Virginia Capes Range Complex

Dear Mr. Fisher:

The Virginia Department of Mines, Minerals and Energy has reviewed the information that you provided for the above-referenced project. Based on this review I offer the following comment. If permanent offshore structures are not being constructed and the planned activities can co-exist with any future gas and mineral exploration / development or offshore alternative energy generation facilities, I do not anticipate a significant impact to energy or mineral resources.

Please contact me at (434) 951-6351 if I can be of further assistance.

Sincerely,

Matt Heller, P.G.
Geologist Manager

If you cannot meet the deadline, please notify JOHN FISHER at 804/698-4339 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

MR. JOHN E. FISHER
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319
jefisher@deq.virginia.gov

JOHN E. FISHER
ENVIRONMENTAL PROGRAM PLANNER

COMMENTS

We request that the Navy continue to consult directly with DHR pursuant Section 106 of the National Historic Preservation Act (as amended) and its implementing regulations codified at 36 CFR Part 800 which require Federal agencies to consider the effects of their undertakings on historic properties.

(signed) _____ (date) 1/23/09

(title) ARCHAEOLOGIST

(agency) DHR (FILE # 2006-1783)

PROJECT # 09-003F **4/07**

COMMONWEALTH of VIRGINIA

Randall P Burdette
Director

Department of Aviation
5702 Gulfstream Road
Richmond, Virginia 23250-2422

V/TDD • (804) 236-3624
FAX • (804) 236-3635

January 21, 2009

Mr. John E. Fisher
Department of Environmental Quality
Office of Environmental Impact Review
629 East Main Street, 6th Floor
Richmond, Virginia 23219

Re: DOD/ Department of the Navy
Atlantic Fleet Training, Research, Development,
Testing & Evaluation/VA CAPES Range Complex
Consistency Determination (09-003F)

Dear Mr. Fisher:

Thank you for requesting our comments on the Project concerning Atlantic Fleet Training, Research, Development, Testing and Evaluation at the Virginia CAPES Range Complex, Project
Number 09-003F.

The Virginia Department of Aviation has reviewed the document and does not have any comments concerning this project at this time. DOAV does not anticipate any adverse impacts from the project. The Department of Aviation appreciates the opportunity to comment on this project.

Sincerely,

R. N. (Rusty) Harrington
Manager, Planning and Environmental Section
Airport Services Division

tbm/

HAMPTON ROADS
PLANNING DISTRICT COMMISSION

February 3, 2009

Mr. John E. Fisher
Department of Environmental Quality
Office of Environmental Impact Review
629 West Main Street, Sixth Floor
Richmond, VA 23219

Re: Atlantic Fleet Training, Research, Development, Testing, and Evaluation in the Virginia Capes Range Complex DEQ #09-003F (ENV:GEN)

Dear Mr. Fisher:

Pursuant to your request of January 6, 2009, the staff of the Hampton Roads Planning District Commission has reviewed the Consistency Determination for the proposed Atlantic Fleet training, research, development, testing, and evaluation activities in the Virginia Capes Range Complex.

Based on this review, the proposal is generally consistent with local and regional plans and policies.

We appreciate the opportunity to review this project. If you have any questions, please do not hesitate to call.

Sincerely,

Dwight L. Farmer
Executive Director/Secretary

MLJ/fh

If you cannot meet the deadline, please notify JOHN FISHER at 804/698-4339 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

MR. JOHN E. FISHER
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319
jefisher@deq.virginia.gov

JOHN E. FISHER
ENVIRONMENTAL PROGRAM PLANNER

COMMENTS

Any proposed temporary or permanent impacts to State-owned submerged lands must first receive a permit from the Commission. Such proposed impacts must be submitted for review in the form of a Joint Permit Application.

(signed) _____ (date) 2-5-09

(title) Env. Eng.

(agency) VMRC

PROJECT # 09-003F

4/07

DEPARTMENT OF ENVIRONMENTAL QUALITY
TIDEWATER REGIONAL OFFICE
ENVIRONMENTAL IMPACT REVIEW COMMENTS

February 2, 2009

PROJECT NUMBER: 09-003F

PROJECT TITLE: Atlantic Fleet Training, Research, Development, Testing & Evaluation in the Virginia Capes Range Complex

As Requested, TRO staff has reviewed the supplied information and has the following comments:

Petroleum Storage Tank Cleanups:
No comment- There are no petroleum release cases involved in this project.

Petroleum Storage Tank Compliance/Inspections:
No comments- No regulated tank facilities involved.

Virginia Water Protection Permit Program (VWPP):
No comment.

Air Permit Program :
No comment.

Water Permit Program :
No comment - There are no activities described for this project that will impact ground water managed under the Ground Water Withdrawal Regulations.
The TRO VPDES/VPA Permit Section has no comment. There are no permits under our jurisdiction applicable to the construction activities described in this document.

Waste Permit Program :
No comment.

The staff from the Tidewater Regional Office thanks you for the opportunity to provide comments.

Sincerely,

Michelle R. Hollis
Environmental Specialist
5636 Southern Blvd.
VA Beach, VA 23462
(757) 518-2146
(757) 518-2009 Fax
mrhollis@deq.virginia.gov

VIRGINIA DEPARTMENT OF
ENVIRONMENTAL QUALITY

MEMORANDUM

TO: John Fisher, Environmental Program Planner

FROM: Paul Kohler, Waste Division Environmental Review Coordinator

DATE: January 31, 2009

COPIES: Sanjay Thirunagari, Waste Division Environmental Review Manager; file

SUBJECT: Environmental Impact Report; Atlantic Fleet Training, Research, Development, Testing, & Evaluation in the Virginia Capes Range; DEQ Project Code

The Waste Division has completed its review of the Consistency Determination report for the Atlantic Fleet Training, Research, Development, Testing, & Evaluation in the Virginia Capes Range project in Virginia. We have the following comments concerning the waste issues associated with this project:

This is largely an off-shore project and the scope is extensive. For each on shore area in Virginia where any work is to take place, the applicant needs to conduct an environmental investigation on and near the property to identify any solid or hazardous waste sites or issues before work can commence. This investigation should include a search of waste-related databases. Please see the attached page regarding this database search

Any soil that is suspected of contamination or wastes that are generated must be tested and disposed of in accordance with applicable Federal, State, and local laws and regulations. Some of the applicable state laws and regulations are: Virginia Waste Management Act, Code of Virginia Section 10.1-1400 *et seq.*; Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC 20-60); Virginia Solid Waste Management Regulations (VSWMR) (9VAC 20-80); Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110). Some of the applicable Federal laws and regulations are: the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 *et seq.*, and the applicable regulations contained in Title 40 of the Code of Federal Regulations; and the U.S. Department of Transportation Rules for Transportation of Hazardous materials, 49 CFR Part 107.

Also, structures to be demolished should be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to demolition. If ACM or LBP are found, in addition to the federal waste-related regulations mentioned above, State regulations 9VAC 20-80-640 for ACM and 9VAC 20-60-261 for LBP must be followed.

Please note that DEQ encourages all construction projects and facilities to implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated. All generation of hazardous wastes should be minimized and handled appropriately.

If you have any questions or need further information, please contact Paul Kohler at (804) 698-4208.

Attachment: Waste Information

Waste Information

There are four Waste Division databases that are to be used to complete this review. These are the Solid Waste Database, CERCLA Facilities, Voluntary Remediation Program, and Hazardous Waste Facilities databases.

The Solid Waste Database
A list of active solid waste facilities in Virginia.

CERCLA Facilities Database
A list of active and archived CERCLA (EPA Superfund Program) sites.

Hazardous Waste Facilities Database
A list of hazardous waste generators, hazardous waste transporters, and hazardous waste storage and disposal facilities. Data for the CERCLA Facilities and Hazardous Waste Facilities databases are periodically downloaded by the Waste Division from U.S. EPA's website.

Accessing the DEQ Databases:
The report author should access this information on the DEQ website at http://www.deq.state.va.us/waste/waste.html . Scroll down to the databases which are listed under Real Estate Search Information heading.

The ***solid waste information*** can be accessed by clicking on the Solid Waste Database tab and opening the file. Type the county or city name and the word County or City, and click the Preview tab. All active solid waste facilities in that locality will be listed.

The ***Superfund information*** will be listed by clicking on the Search EPA's CERCLIS database tab and opening the file. Click on the locality box, click on sort, then click on Datasheet View. Scroll to the locality of interest.

The ***hazardous waste*** information can be accessed by clicking on the Hazardous Waste Facility tab. Go to the Geography Search section and fill in the name of the city or county and VA in the state block, and hit enter. The hazardous waste facilities in the locality will be listed.

The ***Voluntary Remediation Program*** GPS database can be accessed by clicking on "Voluntary Remediation," then "What's in my backyard" in the center shaded area, and then under "Mapping Applications," click on "What's in my backyard" again.

This database search will include most waste-related site information for each locality. In many cases, especially when the project is located in an urban area, the database output for that locality will be extensive.

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N4/7/1097
December 19, 2008

Ms. Sarah Cooksey
Delaware Coastal Programs
Dept. of Natural Resources & Environmental Control
89 Kings Highway
Dover, DE 19901

Dear Ms. Cooksey:

The U.S. Navy is proposing activities associated with U.S. Navy Atlantic Fleet training; research, development, testing, and evaluation (RDT&E); and associated range capabilities enhancements in the Virginia Capes (VACAPES) Range Complex. The purpose of the Proposed Action is to: 1) Achieve and maintain Fleet readiness using the VACAPES Range Complex to support and conduct current, emerging, and future training operations and RDT&E operations; 2) Expand warfare missions supported by the VACAPES Range Complex; and 3) Upgrade and modernize existing range capabilities to enhance and sustain U.S. Navy training and RDT&E.

Pursuant to Section 307 (c) (1) (16 United States Code (USC) 1456) of the Federal Coastal Zone Management Act of 1972, as amended, we have determined that the Proposed Action will: (1) be conducted in a manner consistent with the enforceable policies of Delaware's approved coastal management program, and (2) not impact natural or cultural resources of the State's coastal zone. The basis for this "Negative Determination" is detailed in Enclosure (1) based on the enforceable policies in the state's federally approved coastal management plan[1].

In addition, Enclosure (2) is a CD-Rom of the VACAPES Draft Environmental Impact Statement (DEIS)/Overseas EIS (OEIS) and appendices which was published and released to the public for comment on June 27, 2008[2] in compliance with the National Environmental Policy

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[1] See CZMA section 304 (16 USC 1453 (6a)). An enforceable policy is a state policy that is legally binding under state law, and by which a state exerts control over private and public coastal uses and resources, and which are incorporated in the state's federally approved coastal management plant. An enforceable policy is limited to a state's jurisdiction and must be given legal effect by state law and cannot apply to federal lands, federal waters, federal agencies or other areas or entities outside the state's jurisdiction, unless authorized by federal law.

[2] See Federal Register, Vol. 73, No. 125, Friday, June 27, 2008, pages 36498 to 36501.

Act and Executive Order 12114. The VACAPES DEIS/OEIS may be obtained by visiting the project's website: www.vacapesrangecomplexeis.com.

Since the publication of the VACAPES DEIS/OEIS in the Summer of 2008, the U.S. Navy recently completed an informal consultation with the U.S. Fish and Wildlife Service (USFWS) on October 7, 2008, to address the proposed activities and its potential impact upon certain endangered and threatened species. The informal consultation with USFWS is documented in Enclosure (3).

In accordance with 15 CFR § 930.35, the Department of the Navy has reviewed Delaware's coastal management program and associated enforceable policies and has determined that the proposed activities in the VACAPES Range Complex would have no reasonably foreseeable effects to the state's coastal zone or its resources.

In accordance with 15 CFR § 930.35(c), the State of Delaware has 60 days from the receipt of this document in which to concur with or object to this Negative Determination, or to request an extension under 15 CFR § 930.41(b). Given the critical nature of this training, we are seeking your concurrence with our Negative Determination, and as a possible means to expedite this process, my staff is prepared to discuss this proposal in more detail and answer any questions you or your staff may have. Our point of contact is Ms. Erin Swiader, Naval Facilities Engineering Command, Atlantic, (757) 322-4960.

Delaware's concurrence will be presumed if its response is not received by the U.S. Navy (Atlantic Fleet) within 60 days from receipt of this Determination. Delaware's response or other inquires should be sent to: Naval Facilities Engineering Command, Atlantic, Attn: Code EV22 (VACAPES EIS/OEIS Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278; or Facsimile (757) 322-4805. If additional information should be required, requests for such information should be requested within ten days of receipt of this Negative Determination.

Sincerely,

J. W. MURPHY
Deputy Chief of Staff
for Operational Readiness
and Training

Enclosures: 1. Federal Agency CZMA Negative Determination for Delaware
2. VACAPES DEIS/OEIS CD-Rom
3. USFWS Informal Consultation

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) NEGATIVE DETERMINATION FOR DELAWARE

INTRODUCTION

This document provides the State of Delaware with the Department of the Navy's (U.S. Navy) Negative Determination under CZMA 16 United States Code (USC) § 1451 *et seq.* and 15 Code of Federal Regulations (CFR) § 930.35. The information in this Negative Determination is provided pursuant to 15 CFR § 930.35.

This CZMA Negative Determination addresses the Proposed Action of the Virginia Capes (VACAPES) Range Complex Environmental Impact Statement (EIS)/Overseas EIS (OEIS).

NEGATIVE DETERMINATION

In accordance with 15 CFR § 930.35, the Department of the Navy has reviewed Delaware's Coastal Management Program (CMP) and associated enforceable policies and has determined that the Navy's Proposed Action will have no effects on any coastal use or resource.

The U.S. Navy does not propose to conduct training or testing activities as described in the VACAPES Range Complex EIS/OEIS, in the States coastal zone.

PROPOSED FEDERAL AGENCY ACTION

The U.S. Navy has prepared an EIS/OEIS to assess potential environmental impacts in the VACAPES Range Complex over a 10-year planning horizon. The EIS/OEIS is expected to be completed in the Spring of 2009. The proposed activities evaluated in the EIS/OEIS are associated with U.S. Navy Atlantic Fleet training; research, development, testing, and evaluation (RDT&E) activities; and associated range capabilities enhancements (refer to Chapter 2 of the VACAPES EIS/OEIS for specific locations and descriptions of U.S. Navy operations: www.vacapesrangecomplexeis.com). The components of the VACAPES Range Complex include 28,672 square nautical miles (nm^2) of special use area warning area; 27,661 nm^2 of offshore surface and subsurface operating area; and 18,092 nm^2 of deep ocean area greater than 100 fathoms (600 feet). The Range Complex's western boundary begins at 3 nm from Delaware's shoreline (refer to the enclosed CD file in PDF format for Chapter 2 of the EIS/OEIS on specific locations in the range complex). The VACAPES Study Area also includes 420 nm^2 of the lower Chesapeake Bay.

The EIS/OEIS was prepared by the U.S. Navy in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 USC Section 4321); The Council on Environmental Quality regulations for implementing the procedural provisions of the NEPA (Title 40 CFR Parts 1500-1508); Department of the Navy procedures for implementing the NEPA (32 CFR 775); Executive Order (E.O.)12114, Environmental Effects Abroad of Major Federal Actions; and Department of Defense regulations implementing E.O. 12114 (32 CFR Part 187). The Proposed Action requires analysis of potential impacts within and outside U.S. territory. Therefore, this document was written to satisfy the requirements of both the NEPA (for areas within the United States) and E.O. 12114.

In accordance with 50 CFR Part 401.12, the U.S. Navy has prepared a separate Biological Evaluation to assess the potential effects from the Proposed Action on marine resources and anadromous fish (which live in saltwater but spawn in freshwater) protected by the National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA). In accordance with the Marine Mammal Protection Act (16 USC Section 1371[a][5]), the U.S. Navy has submitted a request for a Letter of Authorization to NMFS for the incidental taking of marine mammals by the Proposed Action. The U.S. Navy has prepared a separate Consultation Package in accordance

with legal requirements set forth under regulations implementing Section 7 of the ESA (50 CFR 402; 16 USC 1536 (c)) for listed species under jurisdiction of the U.S. Fish and Wildlife Service. These documents are provided electronically in PDF format on the enclosed CD.

Proposed Action

The Proposed Action is to support and conduct current and emerging training and RDT&E operations in the VACAPES Range Complex. To achieve this, the U.S. Navy proposes to:

- Maintain training and RDT&E operations at current levels if the No Action Alternative is selected.

If either Alternative 1 or Alternative 2 is selected, then:

- Increase or modify training and RDT&E operations from current levels in support of the Fleet Response Training Plan (FRTP).
- Accommodate mission requirements associated with force structure changes, including those resulting from the introduction of new platforms (aircraft and weapons systems).
- Implement enhanced range complex capabilities.

The U.S. Navy's Preferred Alternative is Alternative 2, which includes implementation of Alternative 1 with additional increases in some operations, a reduction of bombing exercises, and designation of additional mine warfare training areas within the VACAPES Study Area to provide additional support during training events. Under the Preferred Alternative, all components of the Proposed Action (for example, increases in training and RDT&E operations, force structure changes, and implementation of enhancement recommendations) would be achieved, based on the goal of meeting the purpose and need of the Proposed Action to the maximum extent possible by optimizing training to support future contingencies. The U.S. Navy is seeking concurrence on a Negative Determination based on the Preferred Alternative.

Purpose and Need for Action

Operational requirements for deployment of naval forces world-wide drive and shape training doctrine and procedures. The nature of modern warfare and security operations has become increasingly complex. Navy training activities must focus on achieving proficiency in eight functional areas, known as Primary Mission Areas or, more commonly warfare areas: Air Warfare, Amphibious Warfare, Surface Warfare, Anti-submarine Warfare, Mine Warfare, Strike Warfare, Electronic Combat, and Naval Special Warfare. The EIS/OEIS addresses putting into practice the training strategies described in the FRTP to implement the Fleet Response Plan, to ensure continuous availability of agile, flexible, trained, and ready, surge-capable (rapid-response) forces.

The purpose of the Proposed Action is to:

- Achieve and maintain Fleet readiness using the VACAPES Range Complex to support and conduct current, emerging, and future training operations and RDT&E operations;
- Expand warfare missions supported by the VACAPES Range Complex; and
- Upgrade and modernize existing range capabilities to enhance and sustain U.S. Navy training and RDT&E.

The need for the Proposed Action is to provide range capabilities for training and equipping combat-capable naval forces ready to deploy worldwide. In this regard, the VACAPES Range Complex furthers the U.S. Navy's execution of its congressionally mandated roles and

responsibilities under Title 10 USC Section 5062. To implement this Congressional mandate, the U.S. Navy needs to:

- Maintain current levels of military readiness by training in the VACAPES Range Complex.
- Accommodate future increases in operational training tempo in the VACAPES Range Complex and support the rapid deployment of naval units or strike groups.
- Achieve and sustain readiness of ships and squadrons so that the U.S. Navy can quickly surge significant combat power in the event of a national crisis or contingency operation, consistent with the FRTP.
- Support the acquisition and implementation into the Fleet of advanced military technology. The VACAPES Range Complex must adequately support the testing and training needed for new platforms (aircraft and weapons systems).
- Maintain the long-term viability of the VACAPES Range Complex while protecting human health and the environment, and enhancing the quality and communication capability and safety of the range complex.

Support to current, emerging, and future training and RDT&E operations, including implementation of range enhancements, entails the actions evaluated in this EIS/OEIS. These potentially include:

- Increasing the use of contractor-operated small aircraft that simulate enemy aircraft during training (commercial air services support for fleet opposition forces and electronic warfare threat training);
- Increasing anti-piracy and maritime interdiction training (anti-terrorism surface strike group training);
- Supporting MH-60R/S helicopter warfare mission areas; and
- Conducting realistic mine warfare training with mine shapes in designated areas using existing and new platforms.

DELAWARE'S COASTAL MANAGEMENT PROGRAM

Due to its small size, the entire State of Delaware is considered coastal zone. The seaward extent of the State of Delaware's coastal zone is 5.6 kilometers (3 nm) into the Atlantic Ocean. Delaware's CMP is comprised of the following enforceable policies:

Delaware Coastal Program		
RESOURCE	**ENFORCEABLE POLICIES**	**SUMMARY**
Air Quality	▪ 7 Delaware Code Chapter 60. ▪ Regulation No. 1, 2, 3, 4, 5, 6 and/or 18, 7, 8, 9, 10, 11, 12, 13, 14, 19, 20, 21, 22, 24, 25 and/or 30, 29, and 38 of the State of Delaware "Regulations Governing the Control of Air Pollution".	Regulates the development of and use of air resources.
Beach Management	▪ 7 Delaware Code 4701(c), 6801, 6802(l), 6803, 6803(b), 6804, 6806, 6808, 6810, 4701(c), 6805(a), 6805(c), 6805(d). ▪ State of Delaware Regulations Governing Beach Protection and the Use of Beaches, § 2.07, § 2.08, § 4.03, and § 4.04.	Provides for the protection of public and private beaches of the state.

Delaware Coastal Program		
RESOURCE	**ENFORCEABLE POLICIES**	**SUMMARY**
	▪ Executive Order No. 43, August 15, 1996.	
Coastal Waters	▪ 7 Delaware Code 6001 (a)(2), (a)(3), (a)(4), (a)(5), 6001 (c)(2), 6003(a), 6003(b), 6003(c) 6203, 6202(7)(5) and (9), 6011(b), 6023(a) 6023(b), 6023(c), 6037, 6023(f). ▪ DNREC Regulations, Surface Water Quality Standards, § 1.1, § 1.2, § 3.1, § 3.2, § 3.3, § 10, § 3.4, § 3.5, § 3.6, § 4.1, § 6.2, § 11.2 (a), § 11.5(a)(ii). ▪ DNREC Regulations Governing the Control of Water Pollution, § 2.05, § 2.06, § 3.04(a), § 4.01 § 7 and 8, § 8.01, § 12.01. ▪ 16 Delaware Code 1301. ▪ State of Delaware Regulations Governing Public Drinking Water Systems, § 22.304. ▪ Delaware Sediment and Stormwater Regulations, § 3(1)(A)(B)(C) and (D), 3(2)(A)(1)(2)(3) and (4), 8(1), § 10(2)(B), § 10(3)(D), and § 10(3)(E).	Regulates development and utilization of the land and water resources of the state.
Fish and Wildlife	▪ 7 Delaware Code 102(a), 1902(a)(1)(2)(5)	Protects, manages, and conserves all forms of protected wildlife of the State, and enforces proper actions and proceedings any laws related thereto.
Flood Hazard Areas	▪ Delaware Const., art. II, Sect. 25; 9 Delaware Code Ch. 26, 30, 44, 49, 63, 68 and 69; 22 Delaware Code Ch. 3] ▪ Executive Order No. 43, 48, 29	Regulates floodplain management.
Historic and Cultural Areas	▪ 7 Delaware Code 5305, 5301, 5302, 5405(b).	Protects the states historic and archeological resources.
Inland Bays Water Management	▪ 7 Delaware Code § 7602	Regulates the Delaware Inland Bays Estuary in accordance with the National Estuary Program of 1988.
Living Resources	▪ DNREC Wetlands Regulations, § 7.02 (A and B.	Provides for the protection of living resources' habitat.
Mineral Resources	N/A	Encourages the extraction and production of minerals in a manner which maintains environmental quality.
Natural Areas Management	▪ 7 Delaware Code 7303, 7302(6), 7306(a), 7307(a), 7307(7), 7307(5), 7311, 7307 (1,2 and 6), 7307 (a), (d), 7305(a) (3 and 4) (e)(2); 7306(a and c), 7310, 7305(e)(4), 7307(4)(8), 7308, 7309, 7305(e)(4), ▪ DNREC Regulations Governing Natural Areas and	Regulates the acquisition and protection of natural preserves.

Delaware Coastal Program		
RESOURCE	**ENFORCEABLE POLICIES**	**SUMMARY**
	Preserves	
Nongame and Endangered Species	▪ 7 Delaware Code 202(a), 201(1), and 202 (2).	Provides regulations for the preservation and protection of nongame and endangered wildlife.
Port of Wilmington	N/A	Encourages long-term economic viability of the Port of Wilmington.
Public Lands Management	▪ 7 Delaware Code Chapters 45 and 47.	Provides policies for the supervision, care, and control of public lands.
Recreation and Tourism	N/A	Manages and promotes recreation and tourism especially in coastal areas.
Subaqueous Lands	▪ 7 Delaware Code 7001, 7002 (d), 7002(e) 6201, 7004(a), 7004(b), 7002(f),7003, 6103, 6104, 6107, 6102(d), 6118, 6119(a), 6107, 6119(a), 6119(b), 7201, 7205, ▪ DNREC Regulations, September, 1971, Oil, Gas and Mineral Exploration Regulations ▪ State of Delaware Regulations Governing the Use of Subaqueous Lands, § 1.02(A)(1), § 1.03(C), §1.04(B), § 3.01(A), § 3.01(B), § 3.01(C), § 3.05(C), § 3.05(D).	Provides for the protection of the natural environmental of Delaware's coastal strip.
Transportation Facilities	N/A	Provides recommendations for the construction maintenance and improvement of the state's transportation systems.
Waste Disposal	▪ Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems, § 1.02000, § 3.01000, § 3.02000, § 3.03000, § 3.08000, § 3.09000, § 3.10000, § 3.11000, § 3.12000, § 3.14000, and §3.15000.	Provides policies for on-site wastewater treatment and disposal systems.
Water Supply	▪ 7 Delaware Code. § 6010(F)). ▪ State of Delaware Regulations Governing the Allocation of Water, § 1.01, § 3.04, § 3.03.	Provides that the state shall approve the allocation and use of waters in the State on the basis of equitable apportionment.
Wetlands Management	▪ 7 Delaware Code 6602, 6604, 6603(h), 6003(a)(2), 6606, 6119, and 4001 and Chapter 73 and 75. ▪ Executive Order No. 56, May 26, 1988. ▪ Executive Order No. 43, August 1996; ▪ 29 Delaware Code, Chapter 92. ▪ DNREC[1] Wetlands Regulations, § 1.04.	Regulates preservation and protection of wetlands and provides guidance for minimization of impacts.
Woodlands and	▪ 3 Delaware Code 1501, 1053(a and b), 1056, 1071,	Federal, state, and local

Delaware Coastal Program		
RESOURCE	**ENFORCEABLE POLICIES**	**SUMMARY**
Agricultural Lands	1073 ▪ Delaware's Forestry Practices Erosion and Sediment Law: Rules and Regulations, § 4(6).	government, as well as private individuals and entities, should support and encourage the prevention of unwarranted destruction or damage to woodlands.

[1]Delaware Department of Natural Resources and Environmental Control; N/A = Not Available

FEDERAL REVIEW

The U.S. Navy does not propose to conduct training and testing activities within 3 nm of the Atlantic East Coast, with the exceptions of Mine Interdiction Warfare (MIW) training in the lower Chesapeake Bay (see Figures 2.2-2 and 2.2-3) and aircraft and vessel transits to homeports within the State of Virginia. MIW training will not impede commercial transit lanes in the lower Chesapeake Bay. Commercial traffic will proceed through transit lanes in the lower Chesapeake Bay unimpeded as is today with the proposed MIW training discussed in the Draft EIS. Separate environmental analyses and determinations would be prepared as required for U.S. Navy training and testing that do not have parameters similar to those addressed in the VACAPES EIS/OEIS, as well as for any new systems being proposed.

Based upon the description of all U.S. Navy training and testing activities and their locations enumerated in Chapter 2 of the VACAPES EIS/OEIS, the only activities which could reasonably foreseeably occur near the State of Delaware and its coastal zone would be vessel transits. Vessel transits steaming along the Atlantic Coast normally stay outside the 12 nm territorial boundary. Having reviewed Delaware's CMP and associated enforceable policies, the U.S. Navy has determined that the VACAPES Range Complex Proposed Action would not produce any direct or indirect effects to any of Delaware's coastal zone uses or resources.

In accordance with 15 CFR § 930.35(c), the State of Delaware has 60 days from the receipt of this document in which to concur with or object to this Negative Determination, or to request an extension under 15 CFR § 930.41(b). Given the critical nature of this training, we are seeking your concurrence with our Negative Determination, and as a possible means to expedite this process, my staff is prepared to discuss this proposal in more detail and answer any questions you or your staff may have. Our point of contact is Ms. Erin Swiader, Naval Facilities Engineering Command, Atlantic, (757) 322-4960. The DEIS may be downloaded by visiting the project's website: www.vacapesrangecomplexeis.com.

Delaware's concurrence will be presumed if its response is not received by the U.S. Navy (Atlantic Fleet) within 60 days from receipt of this Determination. Delaware's response or other inquires should be sent to: Naval Facilities Engineering Command, Atlantic, Attn: Code EV22 (VACAPES EIS/OEIS Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278; or Facsimile (757) 322-4805. If additional information should be required, requests for such information should be requested within ten days of receipt of this Negative Determination.

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N4/7/1098
December 19, 2008

Mr. Elder A. Ghigiarelli, Jr.
Deputy Administrator
Coastal Zone Consistency Division
Montgomery Park Business Center
1800 Washington Boulevard
Baltimore, MD 21230

Dear Mr. Ghigiarelli:

The U.S. Navy is proposing activities associated with U.S. Navy Atlantic Fleet training; research, development, testing, and evaluation (RDT&E); and associated range capabilities enhancements in the Virginia Capes (VACAPES) Range Complex. The purpose of the Proposed Action is to: 1) Achieve and maintain Fleet readiness using the VACAPES Range Complex to support and conduct current, emerging, and future training operations and RDT&E operations; 2) Expand warfare missions supported by the VACAPES Range Complex; and 3) Upgrade and modernize existing range capabilities to enhance and sustain U.S. Navy training and RDT&E.

Pursuant to Section 307 (c) (1) (16 United States Code (USC) 1456) of the Federal Coastal Zone Management Act of 1972, as amended, we have determined that the Proposed Action will: (1) be conducted in a manner consistent with the enforceable policies of Maryland's approved coastal management program, and (2) not impact natural or cultural resources of the State's coastal zone. The basis for this "Negative Determination" is detailed in Enclosure (1) based on the enforceable policies in the state's federally approved coastal management plan[1].

In addition, Enclosure (2) is a CD-Rom containing the VACAPES Draft Environmental Impact Statement (DEIS)/Overseas EIS (OEIS) and appendices which was published and released to the public for comment on June 27, 2008[2] in compliance with the National Environmental Policy

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[1] See CZMA section 304 (16 USC 1453 (6a)). An enforceable policy is a state policy that is legally binding under state law, and by which a state exerts control over private and public coastal uses and resources, and which are incorporated in the state's federally approved coastal management plant. An enforceable policy is limited to a state's jurisdiction and must be given legal effect by state law and cannot apply to federal lands, federal waters, federal agencies or other areas or entities outside the state's jurisdiction, unless authorized by federal law.

[2] See Federal Register, Vol. 73, No. 125, Friday, June 27, 2008, pages 36498 to 36501.

Act and Executive Order 12114. The VACAPES DEIS/OEIS may be obtained by visiting the project's website: www.vacapesrangecomplexeis.com.

Since the publication of the VACAPES DEIS/OEIS in the Summer of 2008, the U.S. Navy recently completed an informal consultation with the U.S. Fish and Wildlife Service (USFWS) on October 7, 2008, to address the proposed activities and its potential impact upon certain endangered and threatened species. The informal consultation with USFWS is documented in Enclosure (3).

In accordance with 15 CFR § 930.35, the Department of the Navy has reviewed Maryland's coastal management program and associated enforceable policies and has determined that the proposed activities in the VACAPES Range Complex would have no reasonably foreseeable effects to the state's coastal zone or its resources.

In accordance with 15 CFR § 930.35(c), the State of Maryland has 60 days from the receipt of this document in which to concur with or object to this Negative Determination, or to request an extension under 15 CFR § 930.41(b). Given the critical nature of this training, we are seeking your concurrence with our Negative Determination, and as a possible means to expedite this process, my staff is prepared to discuss this proposal in more detail and answer any questions you or your staff may have. Our point of contact is Ms. Erin Swiader, Naval Facilities Engineering Command, Atlantic, (757) 322-4960.

Maryland's concurrence will be presumed if its response is not received by the U.S. Navy (Atlantic Fleet) within 60 days from receipt of this Determination. Maryland's response or other inquires should be sent to: Naval Facilities Engineering Command, Atlantic, Attn: Code EV22 (VACAPES EIS/OEIS Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278; or Facsimile (757) 322-4805. If additional information should be required, requests for such information should be requested within ten days of receipt of this Negative Determination.

Sincerely,

J. W. MURPHY
Deputy Chief of Staff
for Operational Readiness
and Training

Enclosures: 1. Federal Agency CZMA Negative Determination for Maryland
2. VACAPES DEIS/OEIS CD-Rom
3. USFWS Informal Consultation

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) NEGATIVE DETERMINATION FOR MARYLAND

INTRODUCTION

This document provides the State of Maryland with the Department of the Navy's (U.S. Navy) Negative Determination under Section 307 of the Coastal Zone Management Act (CZMA), 16 United States Code (USC) § 1456, and 15 Code of Federal Regulations (CFR) Part 930.35. The information in this Negative Determination is provided pursuant to 15 CFR Section 930.35.

This CZMA Negative Determination addresses the Proposed Action of the Virginia Capes (VACAPES) Range Complex Environmental Impact Statement (EIS)/Overseas EIS (OEIS).

NEGATIVE DETERMINATION

In accordance with 15 CFR § 930.35, the Department of the Navy has reviewed Maryland's coastal management program and associated enforceable policies and has determined that the U.S. Navy's Proposed Action will have no effects on any coastal use or resource.

The U.S. Navy does not propose to conduct training or testing activities as described in the VACAPES Range Complex EIS/OEIS, in the State's coastal zone.

PROPOSED FEDERAL AGENCY ACTION

The U.S. Navy has prepared an EIS/OEIS to assess potential environmental impacts in the VACAPES Range Complex over a 10-year planning horizon. The EIS/OEIS is expected to be completed in the Spring of 2009. The proposed activities evaluated in the EIS/OEIS are associated with U.S. Navy Atlantic Fleet training; research, development, testing, and evaluation (RDT&E) activities; and associated range capabilities enhancements (refer to Chapter 2 of the VACAPES EIS/OEIS for specific locations and descriptions of U.S. Navy operations: www.vacapesrangecomplexeis.com). The components of the VACAPES Range Complex include 28,672 square nautical miles (nm^2) of special use area warning area; 27,661 nm^2 of offshore surface and subsurface operating area (OPAREA); and 18,092 nm^2 of deep ocean area greater than 100 fathoms (600 feet). The Range Complex's western boundary begins at 3 nm from Maryland's shoreline (refer to the enclosed CD file in PDF format for Chapter 2 of the EIS/OEIS on specific locations in the range complex). The VACAPES Study Area also includes 420 nm^2 of the lower Chesapeake Bay.

The EIS/OEIS was prepared by the U.S. Navy in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 USC Section 4321); the Council on Environmental Quality regulations for implementing the procedural provisions of the NEPA (Title 40 CFR Parts 1500-1508); Department of the Navy procedures for implementing the NEPA (32 CFR 775); Executive Order (E.O.)12114, Environmental Effects Abroad of Major Federal Actions; and Department of Defense regulations implementing E.O. 12114 (32 CFR Part 187). The Proposed Action requires analysis of potential impacts within and outside U.S. territory. Therefore, this document was written to satisfy the requirements of both the NEPA (for areas within the United States) and E.O. 12114.

In accordance with 50 CFR Part 401.12, the U.S. Navy has prepared a separate biological evaluation to assess the potential effects from the Proposed Action on marine resources and anadromous fish (which live in saltwater but spawn in freshwater) protected by the National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA). In accordance with the Marine Mammal Protection Act (16 USC Section 1371[a][5]), the U.S. Navy has submitted a request for a Letter of Authorization to NMFS for the incidental taking of marine mammals by the Proposed Action. The U.S. Navy has prepared a separate Consultation Package in accordance with legal requirements set forth under regulations implementing Section 7 of the ESA (50 CFR

402; 16 USC 1536 (c)) for listed species under jurisdiction of the U.S. Fish and Wildlife Service. These documents are provided electronically in PDF format on the enclosed CD.

Proposed Action

The Proposed Action is to support and conduct current and emerging training and RDT&E operations in the VACAPES Range Complex. To achieve this, the U.S. Navy proposes to:

- Maintain training and RDT&E operations at current levels if the No Action Alternative is selected.

If either Alternative 1 or Alternative 2 is selected, then:

- Increase or modify training and RDT&E operations from current levels in support of the Fleet Response Training Plan (FRTP).
- Accommodate mission requirements associated with force structure changes, including those resulting from the introduction of new platforms (aircraft and weapons systems).
- Implement enhanced range complex capabilities.

The U.S. Navy's Preferred Alternative is Alternative 2, which includes implementation of Alternative 1 with additional increases in some operations, a reduction of bombing exercises, and designation of additional mine warfare training areas within the VACAPES Study Area to provide additional support during training events. Under the Preferred Alternative, all components of the Proposed Action (for example, increases in training and RDT&E operations, force structure changes, and implementation of enhancement recommendations) would be achieved, based on the goal of meeting the purpose and need of the Proposed Action to the maximum extent possible by optimizing training to support future contingencies. The U.S. Navy is seeking concurrence on a Negative Determination based on the Preferred Alternative.

Purpose and Need for Action

Operational requirements for deployment of naval forces world-wide drive and shape training doctrine and procedures. The nature of modern warfare and security operations has become increasingly complex. Navy training activities must focus on achieving proficiency in eight functional areas, known as Primary Mission Areas or, more commonly warfare areas: Air Warfare, Amphibious Warfare, Surface Warfare, Anti-submarine Warfare, Mine Warfare, Strike Warfare, Electronic Combat, and Naval Special Warfare. The EIS/OEIS addresses putting into practice the training strategies described in the FRTP to implement the Fleet Response Plan, to ensure continuous availability of agile, flexible, trained, and ready, surge-capable (rapid-response) forces.

The purpose of the Proposed Action is to:

- Achieve and maintain Fleet readiness using the VACAPES Range Complex to support and conduct current, emerging, and future training operations and RDT&E operations;
- Expand warfare missions supported by the VACAPES Range Complex; and
- Upgrade and modernize existing range capabilities to enhance and sustain Navy training and RDT&E.

The need for the Proposed Action is to provide range capabilities for training and equipping combat-capable naval forces ready to deploy worldwide. In this regard, the VACAPES Range Complex furthers the U.S. Navy's execution of its congressionally mandated roles and responsibilities under Title 10 USC Section 5062. To implement this Congressional mandate, the U.S. Navy needs to:

- Maintain current levels of military readiness by training in the VACAPES Range Complex.

- Accommodate future increases in operational training tempo in the VACAPES Range Complex and support the rapid deployment of naval units or strike groups.
- Achieve and sustain readiness of ships and squadrons so that the U.S. Navy can quickly surge significant combat power in the event of a national crisis or contingency operation, consistent with the FRTP.
- Support the acquisition and implementation into the Fleet of advanced military technology. The VACAPES Range Complex must adequately support the testing and training needed for new platforms (aircraft and weapons systems).
- Maintain the long-term viability of the VACAPES Range Complex while protecting human health and the environment, and enhancing the quality and communication capability and safety of the range complex.

Support to current, emerging, and future training and RDT&E operations, including implementation of range enhancements, entails the actions evaluated in this EIS/OEIS. These potentially include:

- Increasing the use of contractor-operated small aircraft that simulate enemy aircraft during training (commercial air services support for fleet opposition forces and electronic warfare threat training);
- Increasing anti-piracy and maritime interdiction training (anti-terrorism surface strike group training);
- Supporting MH-60R/S helicopter warfare mission areas; and
- Conducting realistic mine warfare training with mine shapes in designated areas using existing and new platforms.

MARYLAND'S COASTAL MANAGEMENT PROGRAM

The State of Maryland's coastal zone extends to the inland boundary of the 16 counties bordering the Atlantic Ocean, the Chesapeake Bay, and the Potomac River (as far as the municipal limits of Washington, D.C), and includes Baltimore City and all local jurisdictions within the counties. The seaward extent is 3 nm into the Atlantic Ocean. Maryland's Coastal Management Program is comprised of the following enforceable policies:

A. Activities Occurring in Coastal Waters

(1) **Recreational Boating** (*Natural Resources Article, Sections 1-302, 1,303, 4-202, 8-702, 8-703, 8-707, 8-1402, 8-1405, 8-701, 8-703, 8-707, 8-704(b), 8-716, 8-723, 5-901, 9-102, 9-306, 9-501; Department of Natural Resources [DNR] Regulations Section 08.05.04.02; Article 25, Section 5; Article 66B;, Article 9, Article 88C, Section 2(q)*).

(2) **Commercial Shipping (Oil Spill Containment and Prevention)** *(Natural Resources Article, Sections 8-203, 8-1410(b), 8-1405, 8-1406, 8-1408, 8-1410, 8-1411, 8-1417, 6-501, 6-508, 1-302, 1-303, 6-502, 6-508, 8-1413, 1413.2; Transportation Article, Section 6-206; Water Resources Administration Rules and Regulations, Section 08.05.04.07; DNR Regulation 08.05.04.07; Federal Water Pollution Control Act Amendments of 1972, Section 311)*

(3) **Dredging and Disposal of Dredged Material** (*Natural Resources Article, Sections 9-202, 9-306, 8-1413.2, 1-302, 8-1413.1, 8-1601-8-16015, 1-302, 1-303, 8-1602,8-1601, 1-101, 1-104, 1-302, 8-1402, 8-1405, 9-102 ; Department of Natural Resources Rules and Regulations, Section 08.05.05; Transportation Article 2-103, 6-102, 6-204, 6-206; Rivers and Harbors Act of 1899, Section 10; Federal Water Pollution Control Act Amendments of 1972, Section 404)* .

(4) **Activities Associated with Living Aquatic Resources** *(Natural Resources Article, Sections 4-202, 4-602, 8-203, 4-2A01 et. seq., 4-401 et. seq., 4-601 et. seq., 4-701 et. seq., 4-801 et. seq., 4-901 et. seq., 4-1008 et. seq., 4-1021 et. seq., 4-1032 et seq., 4-*

1101, 4-207, 4-1103, 4-501, 1-302, 1-303, 8-802, 9-102, 9-202, 8-701, 8-703, 8-704, 8-802, 8-1401 et. seq., 8-1402, 8-1413.1, 8-1413.2, 8-1601, 8-1101 et. seq., 8-1602; DNR Regulations 08.05.05; State Critical Areas Program Art. 88C, Section 2(b)(3) Regulation 16.00.02; Article 43, Section 394(a); Title 9; Regulation 08.05.03.01; 56 Attorney General Op.'s 478; Natural Resources Article Title 4, Subtitles 7, 8, 9, 10; Endangered Species of Fish Conservation Act, Article Natural Resources, Section 42A01 et seq.; Federal Water Pollution Control Act Amendments of 1972 Section 312(f)(3).

(5) **Ocean Dumping** *(Natural Resources Article, Sections 1-101, 1-104, 8-1402, 9-202, 1-302, 1-303, 8-208, 8-1402; Marine Protection, Research and Sanctuaries Act: 33USC Section 1401 et. seq.; Federal Rules and Regulations Pertaining to Ocean Dumping: 40 CFR 222-227; Federal Administrative Procedures Act 5 USC Section 560; 40 CFR 220-227;*

(6) **OCS Exploration, Production and Development** *(Natural Resources Article, Sections 1-101, 1-104, 1-1301 et. seq., 1-302, 1-303, 6-501 et. seq., 8-203, 8-1402; Final Regulation 30 CFR Parts 251 and 252; 15 CFR Part 930 Subpart E under the OCS Lands Act of 1953; NEPA of 1969; CZMA of 1972; Wetlands Law Article Natural Resources Title 9.*

B. Activities Occurring in Intertidal Areas

(1) **Use of Beach Areas** *(Natural Resources Article, Sections 5-207, 5-901 et. seq. to 10-208, 10-2A01 et seq., 10-801, 5-904 et. seq., 5-903, 5-906, 5-201, 5-1101 et. seq., 8-1105.1, 1-302, 5-201, 9-102, 9-202; Natural Resources Article 88C, Section 5-901 et. seq.; Maryland Outdoor Recreation and Open Space Plan, Phase III-Action Plan pp 9-10; Wetlands Law Article Natural Resources Title 9; Rivers and Harbors Act of 1899, Section 10; Federal Water Pollution Control Act of 1972, Section 402; Sanitation Standards for Bathing Beaches Article 42, Section 2-228; DHMH Regulation 10.17.24; State Critical Areas Program Article 88C, Section 2(b)(3).*

(2) **Activities in Tidal Wetlands** *(Natural Resources Article, Sections 9-102,9-202, 9-306, 1-302, 9-201, 9-306, 9-303, 9-102, 9-201, 9-303(4), 1-202(d); Wetlands Law Article Natural Resources Title 9; Federal Water Pollution Control Act Amendments of 1972, Section 404; Rivers and Harbors Act of 1899, Section 10.*

C. Activities Occurring in Shoreland Areas

(1) **Activities in Areas with Significant Shore Erosion** *(Natural Resources Article, Sections 8-1002, 8-1004, 1-302, 1-303, 8-9A01, 8-9A02, 1105.1, 9-102, 9-306, 9-202, 9-120, 8-1402, 9-103, ; Governor's Executive Order 01.01.1978.05, 1978); President's Executive Order 11988; Water Resources Council Guidelines for Implementing Executive Order 11988; HUD Flood Insurance Program Regulations, Section 1910.5; Wetlands Law Article Natural Resources, Title 9; Rivers and Harbors Act of 1899, Section 10; Article 88C, Section 2(b)(3).*

(2) **Activities in Coastal Tidal and Non-tidal Floodplains** *(Natural Resources Article, Sections 8-801, 8-803, 8-9H01 et. seq., 8-905, 8-9A02, 8-9A05, 8-9A04, 8-9A06, 1-302, 1-303, 8-1101; Federal Flood Insurance Program; Federal Water Pollution Act Amendments of 1972, Section 404; Rivers and Harbors Act of 1899, Section 10.*

(3) **Activities in Non-tidal Wetlands** *(Natural Resources Article, Sections 8-801, 8-803, 8-9A02, 8-1101, 8-1402, 8-1405, 1-302, 1-303, 4-202, 4-405, 4-406, 4-2A06, 5-207, 5-801, 5-805, 5-902, 10-202, 10-208, 10-209, 10-801, 10-805,10-2A05 10-2A06; Article 88C Section 2(b)(3); 40 CFR 230.5(b); 40 CFR 41295-6, September 5, 1975; 40 FR 55813-17, December 1, 1975; 33 CFR 323.4(b); 42 FR 37146 July 14, 1977; Federal Water Pollution Control Act Amendments of 1972, Section 404.*

(4) **Use of Agricultural Lands** *(Natural Resources Article, Sections 2-501 et. seq., 3-203, 8-1405, 8-1413, ; Department of Natural Resources Rules and Regulations*

08.05.04.01 and .06 and .08; Agricultural Article Section 8-102(d), 8-102(c), 8-306, 8-307, 5-204, 5-209, 2-501 to 515, 8-101 to 310, 5-101 to 211; Agricultural Land Assessment Article 81, Section 19.

(5) **Use of Forested Lands** *(Natural Resources Article, Sections 5-602, 3-301 et. seq., 5-102, 5-207, 5-602, 5-606, 5-201, 5-302, 5-402, 5-301 et. seq., 5-601 et. seq., 5-608 to 5-610 et. seq., 5-701 et. seq.; Article 88C, Section 2(b)(3); Agricultural Article Sections 2-501).*

(6) **Channelization (and Small Watershed Projects)** *(Natural Resources Article, Sections 4-202, 10-2A05, 10-202, 8-903, 9-102, 9-202, 8-401, 8-410, 8-801, 8-9A02, 1-302, 1-303, 8-803, 1-202, 8-1101, 8-1402, 8-1405; Article 88C, Section 2(b)(3); Wetlands Law Article Natural Resources Title 9; Federal Water Pollution Control Act Amendments of 1977, Section 404.*

(7) **Activities Associated with the Provision of Sufficient Recreational, Open Space and Natural Areas** *(Natural Resources Article, Sections 10-202, 10-2A02, 10-2A06, 5-207, 5-901 et. seq. to 10-208, 10-2A01 et. seq., 10-801, 5-1203, 8-401 et. seq., 5-904 et. seq., 5-201, 5-1101 et. seq., 5-906, 3-201, 3-203, 5-901 to 5-906, 5-110 et. seq., 8-401 et. seq.*

(8) **Activities Affecting Coastal Historical, Cultural and Archaeological Resources** *(Natural Resources Article, Sections 1-302, 2,703, 2-301, 5-102, 5-207; Article 41, Section 181E; Article 66B, Section 8.01 et. seq.*

(9) **Shoreland Activities in General** *(Article 43, Sections 387C, 690, 822, 824, 828; Natural Resources Article, Sections 8-802, 8-1101, 8-1402, 8-1413, Title 8 Subtitles 8, 9, 9A, 11, and 14; 56 Attorney General Opinions 478; Department of Health and Mental Hygiene Rules and Regulations, Section 10.03.27.47; Maryland Interim Watershed Management Policy.*

D. Major Facilities in the Coastal Zone

(1) **Onshore OCS/Oil/Natural Gas Facilities** *(Natural Resources Article, Sections 6-501 et. seq., 6-508.*

(2) **Electric Generating Facilities** *(Natural Resources Article, Sections 3-304, 3-305, 1-302, 1-303, 3-301 et. seq., 8-1402, 8-1405, 8-1413, 9-102, 9-202, 9-306, 3-303, 8-1413; Article 78 Sections 54A, 54B; 57 Attorney General's Opinions 439.*

(3) **Ports** *(Transportation Article Sections 2-103, 2-403, 6-102, 6-204, 6-501, 6-206, 6-304, 6-305, 6-307, 6-309; Maryland Transportation Action Plan; Natural Resources Article Sections 1-302, 1-303, 6-501, 3-501 et. seq., 8-203, 8-1402, 8-1405, 9-102, 9-202, 9-306; Natural Resources Article Title 9 Wetlands Law; Article 41 Sections 330 to 346; Rivers and Harbors Act of 1899, Section10; Federal Water Pollution Control Act Amendments of 1972, Section 404.*

(4) **Industrial Parks** *(Article 41, Sections 258, 266, 439, 440 to 446; Natural Resources Article Sections 1-302, 1-303, 1-304 8-1405, 9-102; Article 88C Sections 2(b)(3), 2(g), 2(q); Article 66B; Article 25 Section 5(d).*

(5) **Mineral Extraction Facilities** *(Natural Resources Article Title 7-6A02, 1-302, 1-303, 1-304, 7-6A06, 7-6A07, 7-6A09, 7-6A10; Article 88C Section 2(q); Article 25 Section 5(d).*

(6) **Large-Scale Residential Facilities** *(Article 88C; Article 66B; Article 25; Article 43, Section 387C; Article 45, Section 882 et. seq.; Natural Resources Article Sections 1-302, 1-303, 8-9A04, 8-1101, 8-1103, 8-1104 8-801, 8-802, 8-1402, 8-1405, 8-1413, 9-102, 9-202, 9-306, 1-101, 1-104;*

(7) **Sewage Treatment Facilities** *(Natural Resources Article Sections 1-302, 1-303, 8-801, 8-803, 8-807, 8-1402, 8-1042, 8-1404, 8-1405, 8-1413, 9-101 et. seq. ; Article 43, Sections 387C, 388, 394, 386A – 399; Article 88C; Federal Water Pollution*

Control Act Amendments of 1972, Sections 201, 301; Department of Health and Mental Hygiene Regulation 10.03.48; 60 Op Attorney General 508;

(8) **Land Transportation Facilities** *(Transportation Article Section 2-103; Maryland Transportation Action Plan; Natural Resources Article Sections 1-302, 1-303, 8-801, 8-802, 8-905, 8-110 et. seq., 8-1402, 8-1405, 8-1413; Article 43 Sections 690 et. seq., 824.*

FEDERAL REVIEW

The U.S. Navy does not propose to conduct training and testing activities within 3 nm of the Atlantic East Coast, with the exceptions of Mine Interdiction Warfare (MIW) training in the Lower Chesapeake Bay (see Figures 2.2-2 and 2.2-3) and aircraft and vessel transits to homeports within the State of Virginia. MIW training will not impede commercial transit lanes in the lower Chesapeake Bay. Commercial traffic will proceed through transit lanes in the lower Chesapeake Bay unimpeded as is today with the proposed MIW training discussed in the Draft EIS. Separate environmental analyses and determinations would be prepared as required for U.S. Navy training and testing that do not have parameters similar to those addressed in the VACAPES EIS/OEIS, as well as for any new systems being proposed.

Based upon the description of all U.S. Navy training and testing activities and their locations enumerated in Chapter 2 of the VACAPES EIS/OEIS, the only activities which could reasonably foreseeably occur near the State of Maryland and its coastal zone would be vessel transits. Vessel transits steaming along the Atlantic Coast normally stay outside the 12 nm territorial boundary. Having reviewed Maryland's Coastal Management Program and associated enforceable policies, the U.S. Navy has determined that the VACAPES Range Complex Proposed Action would not produce any direct or indirect effects to any of Maryland's coastal zone uses or resources.

In accordance with 15 CFR § 930.35(c), the State of Maryland has 60 days from the receipt of this document in which to concur with or object to this Negative Determination, or to request an extension under 15 CFR § 930.41(b). Given the critical nature of this training, we are seeking your concurrence with our Negative Determination, and as a possible means to expedite this process, my staff is prepared to discuss this proposal in more detail and answer any questions you or your staff may have. Our point of contact is Ms. Erin Swiader, Naval Facilities Engineering Command, Atlantic, (757) 322-4960. The Draft EIS may be downloaded by visiting the project's website at: www.vacapesrangecomplexeis.com.

Maryland's concurrence will be presumed if its response is not received by the U.S. Navy (Atlantic Fleet) within 60 days from receipt of this Determination. Maryland's response or other inquires should be sent to: Naval Facilities Engineering Command, Atlantic, Attn: Code EV22ES (VACAPES EIS Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278; or Facsimile (757) 322-4805. If additional information should be required, requests for such information should be requested within ten days of receipt of this Negative Determination.

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N4/7/1099
December 19, 2008

Mr. Steve Rynas
Division of Coastal Management
Department of Environment and Natural Resources
400 Commerce Avenue
Moorehead City, NC 28557-3421

Dear Mr. Rynas:

The U.S. Navy is proposing activities associated with U.S. Navy Atlantic Fleet training; research, development, testing, and evaluation (RDT&E); and associated range capabilities enhancements in the Virginia Capes (VACAPES) and Jacksonville (JAX) Range Complexes. The purpose of the Proposed Action in each range complex is to: 1) Achieve and maintain Fleet readiness using the range complexes to support and conduct current, emerging, and future training operations and RDT&E operations; 2) Expand warfare missions supported by each range complex; and 3) Upgrade and modernize existing range capabilities to enhance and sustain U.S. Navy training and RDT&E.

Pursuant to Section 307 (c)(1), 16 United States Code (USC) 1456 of the Coastal Zone Management Act (CZMA) of 1972, as amended, we have determined that the Proposed Actions in the VACAPES and JAX Range Complexes will: (1) be conducted in a manner consistent with the enforceable policies of North Carolina's approved coastal management program, and (2) not impact natural or cultural resources of the State's coastal zone. The basis for this "Negative Determination" is detailed in Enclosure (1) based on the enforceable policies in the State's federally approved coastal management plan[1].

In addition, Enclosure (2) is a CD-Rom of the VACAPES Draft Environmental Impact Statement (EIS)/Overseas EIS (OEIS) and JAX Draft EIS/OEIS and appendices which were published and released to the public for comment on June 27, 2008[2], in compliance with the National

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[1] See CZMA section 304, 16 USC 1453 (6a). An enforceable policy is a state policy that is legally binding under state law, and by which a state exerts control over private and public coastal uses and resources, and which are incorporated in the states federally approved coastal management plant. An enforceable policy is limited to a state's jurisdiction and must be given legal effect by state law and cannot apply to federal lands, federal waters, federal agencies or other areas or entities outside the state's jurisdiction, unless authorized by federal law.

[2] See Federal Register, Vol. 73. No. 125, Friday, June 27, 2008, pages 36495 to 36501

Environmental Policy Act and Executive Order 12114. Further information regarding these DEIS/OEIS documents may be obtained by visiting the project's websites: www.vacapesrangecomplexeis.com www.jacksonvillerangecomplexeis.com.

Since the publication of the VACAPES and JAX DEIS/OEIS in the Summer of 2008, the U.S. Navy recently completed an informal consultation with the U.S. Fish and Wildlife Service (USFWS) on October 7, 2008, to address the proposed activities and its potential impact upon certain endangered and threatened species. The informal consultation with USFWS is documented in Enclosure (3).

In accordance with 15 Code of Federal Regulations (CFR) Section 930.35, the Department of the Navy has reviewed North Carolina's coastal management program and associated enforceable policies and has determined that the Proposed Actions would have no reasonably foreseeable effects to the State's coastal zone or its resources.

In accordance with 15 CFR Section 930.35(c), the State of North Carolina has 60 days from the receipt of this document in which to concur with or object to this Negative Determination, or to request an extension under 15 CFR Section 930.41(b). Our point of contact is Ms. Kelly Knight, Naval Facilities Engineering Command, Atlantic, (757) 322-4398.

North Carolina's concurrence will be presumed if its response is not received by the U.S. Navy (Atlantic Fleet) within 60 days from receipt of this Determination. North Carolina's response or other inquiries should be sent to: Naval Facilities Engineering Command, Atlantic, Attn: Code EV22 (NEPA Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278; or Facsimile (757) 322-4805. If additional information should be required, requests for such information should be requested within ten days of receipt of this Negative Determination.

Sincerely,

J. W. MURPHY
Deputy Chief of Staff
for Operational Readiness
and Training

Enclosures:
1. Federal Agency CZMA Negative Determination for North Carolina
2. VACAPES and JAX DEIS/OEIS CD-Rom
3. USFWS Informal Consultation

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) NEGATIVE DETERMINATION FOR NORTH CAROLINA

INTRODUCTION

This document provides the State of North Carolina with the Department of the Navy's (U.S. Navy) Negative Determination under the Coastal Zone Management Act (CZMA) 16 U.S.C. § 1456 Section 307 (c) (1) [or (2)] and 15 Code of Federal Regulations (CFR) § 930 (c), for training and testing activities in the Virginia Capes (VACAPES) and Jacksonville (JAX) Range Complexes. The information in this CZMA Negative Determination is provided pursuant to 15 CFR § 930.39.

This CZMA Negative Determination addresses the Proposed Action of the VACAPES Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) and JAX EIS/OEIS.

NEGATIVE DETERMINATION

In accordance with 15 CFR § 930.35, the Department of the Navy has reviewed North Carolina's Coastal Management Program (CMP) and its associated enforceable policies and information provided by the North Carolina Division of Coastal Management (DCM). The U.S. Navy has determined that the Proposed Actions in the VACAPES and JAX range complexes will have no effects on any coastal use or resource. State permits are not required to implement the Proposed Actions.

PROPOSED FEDERAL AGENCY ACTION

The U.S. Navy has prepared an EIS/OEIS for each range complex to assess potential environmental impacts for the Proposed Actions in VACAPES and JAX range complexes over a 10-year planning horizon. These EIS/OEISs are expected to be completed in the Spring of 2009. The proposed activities evaluated in these EIS/OEISs are associated with U.S. Navy training; research, development, testing, and evaluation (RDT&E) activities; and associated range capabilities enhancements (CD files in PDF format are enclosed).

VACAPES Range Complex. The components of the VACAPES Range Complex include 28,672 square nautical miles (nm^2) of special use area (SUA) warning area; 27,661 nm^2 of offshore surface and subsurface OPAREA; and 18,092 nm^2 of deep ocean area greater than 100 fathoms (600 feet). The geographic scope of the EIS/OEIS includes the airspace, seaspace, and undersea space of the VACAPES Range Complex. This area is referred to as the VACAPES Study Area. The VACAPES Study Area does not include any dry land. However, it does include the area from the mean high tide line east (seaward) to the 3 nm boundary of the states of Delaware, Maryland, Virginia, and North Carolina. This 3-nm state boundary also serves as the western boundary of the VACAPES OPAREA (refer to the study area figure in the enclosed CD). The VACAPES Study Area also includes 420 nm^2 of the lower Chesapeake Bay.

JAX Range Complex. The JAX Range Complex geographically encompasses offshore, near-shore, and onshore OPAREA, ranges, and SUA. Components of the JAX Range Complex encompass 50,090 nm^2 of sea space and 62,596 nm^2 of SUA off the coasts of North Carolina, South Carolina, Georgia, and Florida, as well as 20 square miles of inland range area in north-central Florida. The geographic scope of the EIS/OEIS includes the airspace; seaspace; and undersea space of the JAX Range Complex, including the area from the mean high tide line, up to and extending seaward from the 3 nm western boundary of the Jacksonville and Charleston OPAREAs, hereafter referred to as the JAX Study Area. Also included are the inland ranges and

associated restricted airspace of the Rodman Range and Lake George Range (refer to the study area figure in the enclosed CD).

These EIS/OEISs were prepared by the U.S. Navy in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. Section 4321); The Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of the NEPA (Title 40 CFR Parts 1500-1508); Department of the Navy procedures for implementing the NEPA (32 CFR 775); Executive Order (E.O.)12114, Environmental Effects Abroad of Major Federal Actions; and Department of Defense (DoD) regulations implementing E.O. 12114 (32 CFR Part 187). The Proposed Actions require analysis of potential impacts within and outside U.S. territory. Therefore, these documents were written to satisfy the requirements of both the NEPA (for areas within the United States) and E.O. 12114.

In accordance with 50 CFR Part 401.12, the U.S. Navy has prepared a separate biological evaluation for the three range complexes to assess the potential effects from the Proposed Action on marine resources and anadromous fish (which live in saltwater but spawn in freshwater) protected by the National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA). In accordance with the Marine Mammal Protection Act (MMPA) (16 U.S.C. Section 1371[a][5]), the U.S. Navy has submitted a request for a letter of authorization for the three range complexes to NMFS for the incidental taking of marine mammals by the Proposed Action. The U.S. Navy has prepared a separate Consultation Package for the three range complexes in accordance with legal requirements set forth under regulations implementing Section 7 of the ESA (50 CFR 402; 16 U.S.C 1536 (c)) for listed species under jurisdiction of the U.S. Fish and Wildlife Service (USFWS). The USFWS provided in their concurrence letter dated October 7, 2008 that the Proposed Actions may affect but would not adversely affect listed species. These documents are provided electronically in PDF format on the enclosed CD**.**

Proposed Actions

The Proposed Actions are to support and conduct current and emerging training and RDT&E operations in the three range complexes. To achieve this, the U.S. Navy proposes to:

- Maintain training and RDT&E operations at current levels if the No Action Alternative is selected.

If either Alternative 1 or Alternative 2 is selected, then:

- Increase or modify training and RDT&E operations from current levels as necessary in support of the Fleet Response Training Plan (FRTP).
- Accommodate mission requirements associated with force structure changes, including those resulting from the introduction of new platforms (aircraft, and weapons systems).
- Implement enhanced range complex capabilities.

The U.S. Navy's Preferred Alternative for each range complex is Alternative 2, which includes implementation of Alternative 1 with additional increases in some operations, a reduction of bombing exercises, and designation of additional mine warfare training areas to provide additional support during training events. Under the Preferred Alternative, all components of the Proposed Action (for example, increases in training and RDT&E operations, force structure changes, and implementation of enhancement recommendations) would be achieved, based on the goal of meeting the purpose and need of the Proposed Action to the maximum extent possible by optimizing training to support future contingencies. The U.S. Navy is seeking concurrence on a Negative Determination based on the Preferred Alternative.

Purpose and Need for Action

Operational requirements for deployment of naval forces world-wide drive and shape training doctrine and procedures. The nature of modern warfare and security operations has become increasingly complex. Navy training activities must focus on achieving proficiency in eight functional areas, known as Primary Mission Areas: Air Warfare, Amphibious Warfare, Surface Warfare, Anti-submarine Warfare, Mine Warfare, Strike Warfare, Electronic Combat, and Naval Special Warfare. These EIS/OEISs address the training strategies described in the FRTP to implement the Fleet Response Plan, which is to ensure continuous availability of agile, flexible, trained, and ready surge-capable (rapid response) forces.

The purpose for the Proposed Actions is therefore to:

- Achieve and maintain Fleet readiness using the three range complexes to support and conduct current, emerging, and future training operations and RDT&E operations;
- Expand warfare missions supported by the three range complexes; and
- Upgrade and modernize existing range capabilities to enhance and sustain U.S. Navy training and RDT&E.

The need for the Proposed Actions is to provide range capabilities for training and equipping combat-capable naval forces ready to deploy worldwide. In this regard, these range complexes further the U.S. Navy's execution of its Congressionally mandated roles and responsibilities under Title 10 U.S.C § 5062. To implement this Congressional mandate, the U.S. Navy needs to:

- Maintain current levels of military readiness by training in the three range complexes;
- Accommodate future increases in operational training tempo in the three range complexes and support the rapid deployment of naval units or strike groups;
- Achieve and sustain readiness of ships and squadrons so the U.S. Navy can quickly surge significant combat power in the even of a national crisis or contingency operation, and consistent with the FRTP;
- Support the acquisition and implementation into the Fleet of advanced military technology. The three range complexes must adequately support the testing and training needed for new platforms (aircraft and weapons systems); and
- Maintain the long-term viability of the three range complexes while protecting human health and the environment, and enhancing the quality and communication capability and safety of the range complex.

Support to current, emerging, and future training and RDT&E operations, including implementation of range enhancements, entails the actions evaluated in these EIS/OEISs. These potentially include:

- Increase use of contractor-operated small aircraft that simulate enemy aircraft during training (Commercial Air Services Support for Fleet Opposition Forces and Electronic Warfare Threat Training);
- Increase anti-piracy and maritime interdiction training (Anti-terrorism Surface Strike Group Training);
- Support MH-60R/S helicopter warfare mission areas, and Multi-Mission Maritime Aircraft (MMA) training operations; and
- Conduct mine warfare training using a temporary mine training area.

FEDERAL REVIEW

Statutes addressed as part of the federal review and considered in the analysis of the Proposed Actions are discussed in Table 1. The Proposed Actions would not result in any excavation or filling within any estuarine waters, tidelands, or State-owned lakes; therefore, no action is required regarding compliance with North Carolina's Dredge and Fill Law (NCGS 113-229). The U.S. Navy has determined that the Proposed Action in each range complex will have no effects on any coastal use or policies of North Carolina's CMP based on the following information, data, and analysis (given as a summary in the table and presented as comprehensive analysis in Chapter 3 of the EIS/OEIS for each range complex).

Pursuant to 15 CFR § 930.41, the North Carolina State Clearinghouse has 60 days from receipt of this document in which to concur with or object to this Consistency Determination, or to request an extension, in writing, under 15 CFR § 930.41(b). North Carolina's concurrence will be presumed if the U.S. Navy (Atlantic Fleet) does not receive its response within 60 days from receipt of this determination. North Carolina's response should be sent to Naval Facilities Engineering Command, Atlantic, Attn: Code EV22 (NEPA Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278. The DEIS may be downloaded by visiting the project's websites: "www.vacapesrangecomplexeis.com" and "www.jacksonvillerangecomplexeis.com".

Table 1. North Carolina Coastal Management Program Consistency Review

Section (North Carolina Statute)	Consistency	Scope
Activities in Public Trust Areas (DCM 15A North Carolina Administrative Code 07H) State Guidelines for Areas of Environmental Concern (AEC)		
0205 Coastal Wetlands	The Proposed Actions do not include testing and training activities in coastal wetlands; therefore, no impacts would occur.	To conserve and manage coastal wetlands so as to safeguard and perpetuate their biological, social, economic and aesthetic values; to coordinate and establish a management system capable of conserving and utilizing coastal wetlands as a natural resource essential to the functioning of the entire estuarine system.
0206 Estuarine Waters	The Proposed Actions do not include testing and training activities in estuarine waters; therefore, no impacts would occur.	To conserve and manage the important features of estuarine waters so as to safeguard and perpetuate their biological, social, aesthetic, and economic values; to coordinate and establish a management system capable of conserving and utilizing estuarine waters so as to maximize their benefits to man and the estuarine and ocean system.
0207 Public Trust Areas	The Proposed Actions do not include testing and training activities in public trust areas that would restrict public rights for navigation and recreation; therefore, no impacts would occur.	To protect public rights for navigation and recreation and to conserve and manage the public trust areas so as to safeguard and perpetuate their biological, economic and aesthetic value.
0209 Estuarine Shorelines	The Proposed Actions do not include testing and training activities in estuarine shorelines; therefore, no impacts would occur.	Ensures that shoreline development is compatible with the dynamic nature of coastal shorelines as well as the values and the management objectives of the estuarine and ocean system.

Section (North Carolina Statute)	Consistency	Scope
0303 Ocean Hazard Areas	The Proposed Actions do not include testing and training activities in ocean hazard areas; therefore, no impacts would occur.	Ensures protection of natural hazard areas along the Atlantic Ocean shoreline where, because of their special vulnerability to erosion or other adverse effects of sand, wind, and water, uncontrolled or incompatible development could unreasonably endanger life or property. Ocean hazard areas include beaches, frontal dunes, inlet lands, and other areas in which geologic, vegetative and soil conditions indicate a substantial possibility of excessive erosion or flood damage.
0403 Public Water Supplies	The Proposed Actions do not include testing and training activities in small surface water supply watersheds and public water supply well fields; therefore, no impacts to public water supplies would occur.	Regulates development within critical water supply areas is the protection and preservation of public water supply well fields and A-II streams and to coordinate and establish a management system capable of maintaining public water supplies so as to perpetuate their values to the public health, safety, and welfare.
0505 Coastal Areas that Sustain Remnant Species	The Proposed Actions do not include testing and training activities in fragile coastal natural resource areas that sustain remnant species; therefore, no impacts would occur.	Protects unique habitat conditions that are necessary to the continued survival of threatened and endangered native plants and animals and minimizes land use impacts that might jeopardize these conditions.
0506 Coastal Complex Natural Area	The Proposed Actions do not include testing and training activities in significant components of coastal systems or especially notable habitat areas of scientific, educational, or aesthetic value; therefore, no impacts would occur.	Protects features of a designated coastal complex natural area to safeguard its biological relationships, educational and scientific values, and aesthetic qualities. These areas are defined as lands that support native plant and animal communities and provide habitat qualities which have remained essentially unchanged by human activity.

Section (North Carolina Statute)	Consistency	Scope
0507 Unique Coastal Geologic Formations	The Proposed Actions do not include testing and training activities in unique coastal geologic formations; therefore, no impacts would occur.	Preserves unique resources of more than local significance that function as key physical components of natural systems, as important scientific and educational sites, or as valuable scenic resources.
0509 Significant Coastal Archaeological Resources	The Proposed Action would not impact historical resources of the state. The Navy would avoid all known cultural resources; however, if effects to cultural resources are anticipated, consultation with the applicable agencies, including the State Historic Preservation Officer would be initiated in accordance with Section 106 of the National Historic Preservation Act.	Conserves coastal archaeological resources of more than local significance to history or prehistory that constitute important scientific sites, or are valuable educational, associative, or aesthetic resources.
0510 Significant Coastal Historic Architectural Resources	The Proposed Actions do not include testing and training activities in districts, structures, buildings, sites or objects that have more than local significance to history or architecture; therefore, no impacts would occur.	Conserve coastal historic architectural resources of more than local significance which are valuable educational, scientific, associative or aesthetic resources.
0602 Pollution of Water	The Proposed Actions do not include testing and training activities in or adjacent to shell fish waters; therefore, no impacts would occur.	Specifies that no development shall be allowed in any AEC which would have a substantial likelihood of causing pollution of the waters of the state in which shell fishing is an existing use to the extent that such waters would be officially closed to the taking of shellfish.

Section (North Carolina Statute)	Consistency	Scope
0603 Minimum Altitudes	Air traffic control is provided by FAA, which owns and operates the air traffic control system, and the Fleet Area Control and Surveillance Facility in Virginia, which is a designated air traffic control facility and is required to provide air traffic separation consistent with FAA guidelines to ensure the safe, efficient and expeditious flow of air traffic. Therefore; the Proposed Actions would not impact FAA minimum altitude standards.	Specifies that no development involving airspace activity shall be allowed in any AEC which would result in violation of minimum altitude standards adopted by the Federal Aviation Administration (FAA) and codified at 14 CFR Part 91.79.
0604 Noise Pollution	The Proposed Actions do not include airspace activity associated with coastal development; therefore, no impacts would occur.	Specifies that except as required for safe aircraft takeoff and landing operations, airspace activity associated with coastal development shall not impose an increase in average noise exceeding 10 dBA above background levels.
Activities outside Areas of Environmental Concern (DCM 15A North Carolina Administrative Code 07M)		
General Policy Guidelines for the Coastal Area		
0200 Shoreline Erosion	The Proposed Actions do not include development along the ocean or estuarine shoreline; therefore, would not result in shoreline erosion impacts.	Addresses development along the ocean and estuarine shoreline and erosion response measures that should be developed to minimize the loss of private and public resources.
0300 Shorefront Access	The Proposed Actions do not restrict public access to public trust waters; therefore, would not impact shorefront access.	Addresses provision of pedestrian access to the public trust waters, including the ocean beaches and estuarine waters for recreational purposes in the 20 coastal counties.

Section (North Carolina Statute)	Consistency	Scope
0400 Coastal Energy	The Proposed Actions do not include the development of energy facilities or exploration of offshore or OCS energy resources; therefore, would not impact coastal energy.	Addresses development of energy facilities and energy resources in the state and in offshore waters, and exploration for the development of offshore and outer continental shelf (OCS) energy resources such as oil and gas.
0500 Post-disaster	The Proposed Actions do not include any efforts to assist with post-disaster activities; therefore, would not impact plans for post-disaster reconstruction.	Intended to provide guidance on and mitigate for the effects of a coastal natural disaster by providing adequate plans for post-disaster reconstruction.
0600 Floating Structures	Navy ships are excluded from the definition of floating structures; therefore, the Proposed Actions would not impact public trust waters.	Addresses prohibition of floating structures in public trust waters of the coastal area except in permitted marinas.
0700 Mitigation	The Proposed Actions do not include construction or other activities that could result in adverse impacts.	Addresses mitigation for adverse impacts to coastal lands and waters from development.
0800 Coastal Water Quality	The Proposed Actions would not result in releases of constituents in violation of state or federal water quality standards; therefore, no significant impacts on water quality from expended components would occur.	Declares that no land or water use shall cause the degradation of water quality so as to impair traditional uses of the coastal waters, including activities outside the coastal area.
1100 Beneficial Use and Availability of Materials Resulting from the Excavation or Maintenance of Navigation Channels	The Proposed Actions do not include any excavation or maintenance activities or disposal of material from these activities; therefore, no impacts would occur.	Regulates disposal of materials resulting from excavation or maintenance of navigation channels and promotes its beneficial use whenever practicable.
1200 Ocean Mining	The Proposed Actions do not include any mining activities or construction of mining-related structures; therefore, no impacts would occur.	Regulates mining activities in state waters, or in federal waters insofar as the activities affect any land, water use or natural or historic resource of the state waters.

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

James H. Gregson
Director

Dee Freeman
Secretary

February 9, 2009

J. W. Murphy (ATTN Code EV22 (NEPA Project Manager))
Deputy Chief of Staff for Operational Readiness and Training
Naval Facilities Engineering Command
6506 Hampton Blvd.
Norfolk, VA 23508-1278

SUBJECT: **CD09-007** – Consistency Concurrence for Proposed Atlantic Fleet Training Within the Virginia Capes Range Complex (VACAPES) (DCM#20080168)

Dear Mr. Murphy:

We received your Negative Determination on December 29, 2008 for the proposed Atlantic Fleet Training within the Navy's Virginia Capes Range Complex (VACAPES). The Navy proposes, over the next ten years, continued Atlantic Fleet training that includes: research, development, testing, and evaluation; and associated range capabilities enhancements, including infrastructure improvements. The components of the VACAPES Range Complex include 28,672 square nautical miles (nm^2) of special use area (SUA) warning area; 27,661 nm^2 of offshore surface and subsurface operating area (OPAREA); and 18,092 nm^2 of deep ocean area greater than 100 fathoms (600 feet). The proposed activity will occur off the northern coast of North Carolina and the coasts of Virginia, Maryland, and Delaware. The portion of North Carolina affected by VACAPES is the offshore area from the mean high tide line oceanward from the North Carolina/Virginia border south to Ocracoke Inlet.

North Carolina's coastal zone management program consists of, but is not limited to, the Coastal Area Management Act, the State's Dredge and Fill Law, Chapter 7 of Title 15A of North Carolina's Administrative Code, and the land use plan of the County and/or local municipality in which the proposed project is located. It is the objective of the Division of Coastal Management (DCM) to manage the State's coastal resources to ensure that proposed Federal activities would be compatible with safeguarding and perpetuating the biological, social, economic, and aesthetic values of the State's coastal waters.

To solicit public comments, DCM circulated a description of the proposed project to State agencies that would have a regulatory interest. No comments asserting that the proposed activity would be inconsistent with the State's coastal management program were received. Nonetheless, several State agencies expressed concerns related to the proposed activity. The North Carolina Division of Parks and Recreations noted that there are coastal parks that could be affected by the proposed activity. Reflecting prior concerns, the Division of Coastal Management continues to be concerned over the long-term cumulative effects of the sonar and the continued discharge of material into the marine environment. Regarding the continued

discharge of material into the marine environment, the Division of Coastal Management is also concerned that sand sources suitable for beach nourishment projects could be adversely affected. A copy of the responses received has been attached for reference.

DCM has reviewed the submitted information pursuant to the management objectives and enforceable policies of Subchapters 15A NCAC 07H and15A NCAC 07M of Chapter 7 of Title 15A of North Carolina's Administrative Code which are a part of the State's certified coastal management program and concurs that the proposed Federal activity is consistent, to the maximum extent practicable, with the enforceable policies of North Carolina's coastal management program. This concurrence applies only to the Navy's implementation of either Alternative 1 or Alternative 2 and adherence to the mitigation measures as described in the "*VACAPES Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement*" (June 2008). Though we concur with the Navy's Negative Determination, we would encourage the Navy, when conducting its training exercises, to be responsive to the concerns expressed by the various State agencies. Furthermore, we would encourage the Navy to identify areas where sand could be mined and to then minimize the discharge of training debris that could settle in those areas.

Should the proposed action be modified, a revised consistency determination could be necessary. This might take the form of either a supplemental consistency determination pursuant to 15 CFR 930.46, or a new consistency determination pursuant to 15 CFR 930.36. Likewise, if further project assessments reveal environmental effects not previously considered by the proposed action or which become significant due to the long-term cumulative effects of the proposed action, a supplemental consistency certification may be required. If you have any questions, please contact Stephen Rynas at 252-808-2808. Thank you for your consideration of the North Carolina Coastal Management Program.

Sincerely,

Doug Huggett

Doug Huggett
Manager, Major Permits and Consistency Unit

Cc: Jim Gregson, Division of Coastal Management
Jean Lynch, Division of Parks and Recreation
Anne Deaton, Division of Marine Fisheries
Kelly Knight, Naval Facilities Engineering Command, Atlantic

NCDENR

North Carolina Department of Environment and Natural Resources

Division of Coastal Management

Michael F. Easley, Governor | **James H. Gregson, Director** | William G. Ross Jr., Secretary

MEMORANDUM

December 31, 2008

TO: Tancred Miller
Division of Coastal Management - Morehead
400 Commerce Avenue
Morehead City, NC 28557-3421

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Atlantic Fleet Training (VACAPES) (DCM#20080168)

LOCATION: Virginia Capes Range Complex (VACAPES), Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **January 23, 2009**. This is one of two projects the other being Jacksonville/Charleston Range Complexes. The State Clearinghouse previously sent both of these projects out for NEPA review. A copy of the DEIS is on the "T" drive which is accessible if you are within DCM, please see the next page for their location. If you need copies of the DEIS on CD, I can send one. (Steve, Tere, Terry, and Frank please respond directly or delegate.) Your responses will assist us in determining whether the proposed project would be consistent with the State's Coastal Management Program. If the proposed project does not conform to your requirements, please identify the measures that would be necessary to bring the proposed project into conformance. If you have any additional questions regarding the proposed project you may contact me at 252-808-2808.

REPLY

____ No Comment.

____ This office supports the project as proposed.

_✓_ Comments to this project are attached.

____ This office objects to the project as proposed.

Signed: [signature] Date: 1/23/09

CORRECTIONS

Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM

to

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

Comments on VACAPES Consistency Request

Tancred Miller

1/23/09

Sand

NC has an active and growing beach nourishment program, approximately one-half of the state's 320 miles of oceanfront beaches have received or are pursuing beach nourishment. To meet the demand for beach quality sand the state taps resources located inshore, nearshore, and offshore—beyond the state's three mile state limit but inside its twelve mile territorial limit. In all locations, beach quality sand is relatively scarce, and thus highly valuable. Beach quality sand that can be feasibly dredged is found in large cells, or borrow areas, some of which have already been identified along the coast. Most of the state's beach quality sand is believed to be located in the northern offshore region, between the Virginia line and Cape Hatteras.

NC is in the process of further defining offshore sand sources, through efforts such as the NC Beach & Inlet Management Plan (BIMP), and local government initiatives. Some of the sources already identified include areas of Topsail Island and Bogue Banks.

The State is concerned for the protection of these sand sources as beach quality material, free from hazardous debris such as unexploded ordnance and military waste. Protection of NC's beaches is a function of the CRC/DCM because of the public trust attributes of the state's beaches and sediments. The CRC/DCM also has regulatory authority over nourishment activities via the CAMA and the NC Dredge and Fill Law.

Energy

NC is in the process of preparing a state policy and approach towards coastal energy generation. To the extent that these activities might impact the VACAPES operations, the Navy should be aware that energy generation may include conventional drilling for natural gas and oil, and/or offshore wind farms.

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Coastal Management
Michael F. Easley, Governor **James H. Gregson, Director** William G. Ross Jr., Secretary

September 10, 2007

Renee Orr
Chief, Leasing Division
US Department of Interior
Minerals Management Service
381 Elden Street
Herndon, VA 20170

Dear Ms. Orr:

The NC Division of Coastal Management has received your June 14, 2007 request for information on beach restoration and shore protection projects that may require OCS sand and gravel resources over the five to seven year planning period.

There are six federally approved studies or projects in the state at present. Only the West Onslow Beach and New River Inlet (Topsail Beach, NC) and possibly the Bogue Banks, NC project may utilize offshore resources. The Topsail Beach project has identified two potential borrow areas with portions in federal waters (see attached figure) with a potential combined estimated volume of 3.75M cyd. Carteret County officials will be meeting with the US Army Corps of Engineers in October regarding the Bogue Banks Project. This is being planned as a 50-year project with the likelihood of utilizing OCS resources. However, the actual borrow areas are unknown at this time although it is likely that the Morehead City ODMDS will be used to some degree.

If you have any questions or require further information, please contact Mike Lopazanski at (919) 733-2293 ext. 222, email Mike.Lopazanski@ncmail.net.

Sincerely

James H. Gregson

400 Commerce Avenue, Morehead City, North Carolina 28557
Phone: 252-808-2808 \ FAX: 252-247-3330 \ Internet: www.nccoastalmanagement.net

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Parks and Recreation

Beverly Eaves Perdue, Governor Dee Freeman, Secretary Lewis Ledford, Director

January 27, 2009

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

Reference: DCM#20080168, Proposed Atlantic Fleet Training (VACAPES)
DCM#20080169, Proposed Atlantic Fleet Training (JAX)

Dear Mr. Rynas,

The North Carolina State Division of Parks and Recreation (NCDPR) reviewed the U.S. Navy's Negative Determination under the Coastal Zone Management Act for training and testing activities in the Virginia Capes (VACAPES) and Jacksonville (JAX) Range Complexes.

Based on the information provided to us, we are unable to conclude that the proposed actions will have no impacts on coastal use or resources. The proposed actions appear to potentially impact recreation and natural resources at NCDPR holdings as well as other ecologically important state lands and waters. We would like to see these potential impacts considered in the EIS and recommend that all state agencies' comments be addressed. If indeed all training will occur outside of state waters and airspace, this should be clarified. NCDPR's main concerns are as followed:

A. VACAPES Proposed Action
According to the Negative Determination documents, the VACAPES Range Complex includes the restricted airspace in mainland Dare County. The VACAPES Study Area also includes air, sea, and undersea space on the ocean side of the barrier islands from the mean high tide line east to the 3 nm state limit in North Carolina. Between these two areas lie Jockey's Ridge State Park and Run Hill State Natural Area. Pettigrew State Park and Lake Phelps, also NCDPR holdings, fall within Restricted Airspace R-5314 A-J. A map is attached.

Jockey's Ridge is the tallest active dune system on the east coast and is a unique coastal geologic formation. It is also a designated National Natural Landmark. Jockey's Ridge, Run Hill, and Pettigrew State Park are held by the state because they include exceptional natural, recreational,

1615 Mail Service Center, Raleigh, North Carolina 27699-1615
Phone: 919-733-4181 \ FAX: 919-715-3085 \ Internet: www.ncparks.gov

and cultural resources. They are places where people go to enjoy quiet recreation and significant natural resources, as well as to engage in scientific education and research.

1. We would like to know if the proposed action would result in additional military aircraft flying over Jockey's Ridge and Run Hill in order to reach the ocean side Study Area or OPAREA. If the answer is yes, then we request that the EIS explain the location and frequency of such flyovers and consider potential aesthetic impacts, noise pollution, and recreational impacts due them. Additionally, we would like clarification about the minimum altitudes that would be observed over Jockey's Ridge and Run Hill under the proposed impacts.

2. Pettigrew State Park and Lake Phelps, also NCDPR holdings, fall within Restricted Airspace R-5314 A-J. We request clarification about whether training in this airspace will increase or change under the proposed action. If such a change is expected to occur, then noise, wildlife, and/or recreational impacts to these state holdings should be considered in the EIS.

3. It is not clear what types of training activities will occur in the "Study Area" as opposed to the "OPAREA." However, if additional training events will occur in the Study Area, they may be expected to impact state waters and coastal wildlife and natural resources. An EIS should evaluate potential impacts to state fisheries and wildlife, and the state Division of Marine Fisheries and Wildlife Resources Commission should be consulted.

B. JAX Proposed Action

According to the Negative Determination documents, the JAX Range Complex extends from southern North Carolina near Wilmington, south to Florida. It includes some inland airspace, as well as air, sea, and undersea space from the mean high tide line east to the 3 nm state limit and beyond. DPR's holdings in this complex include Lea Island State Natural Area; a portion of Masonboro Island; Baldhead Island State Natural Area; Fort Fisher State Recreation Area; and possibly Carolina Beach State Park. These areas are held by the state because they are examples of exceptional natural and recreational resources. They are places where people go to enjoy quiet recreation and significant natural resources, as well as to engage in scientific education and research. A map is attached.

1. The Charleston OPAREA is the area adjacent to state waters and shoreline that include NCDPR's holdings. It is not clear from the Draft EIS provided what if any training activities will take place in the nearshore section of the Range Complex here. The OPAREA is shown as lying beyond state waters, but the Range Complex area as defined above includes state waters. We request more information about the activities that will occur around our properties in southern North Carolina, including any increase in military aircraft flyovers that would occur over our properties. If the proposed action includes training in airspace over our properties of shoreline and waters around our properties, then potential impacts to recreation, noise levels, and wildlife should be considered in the EIS.

2. If additional training events will occur in this area, they may be expected to impact state waters and coastal wildlife and natural resources. An EIS should evaluate potential impacts to state fisheries and wildlife, and the state Division of Marine Fisheries and Wildlife Resources Commission should be consulted.

TRAINING AREAS WEST OF THE 3 NM STATE WATERS BOUNDARY

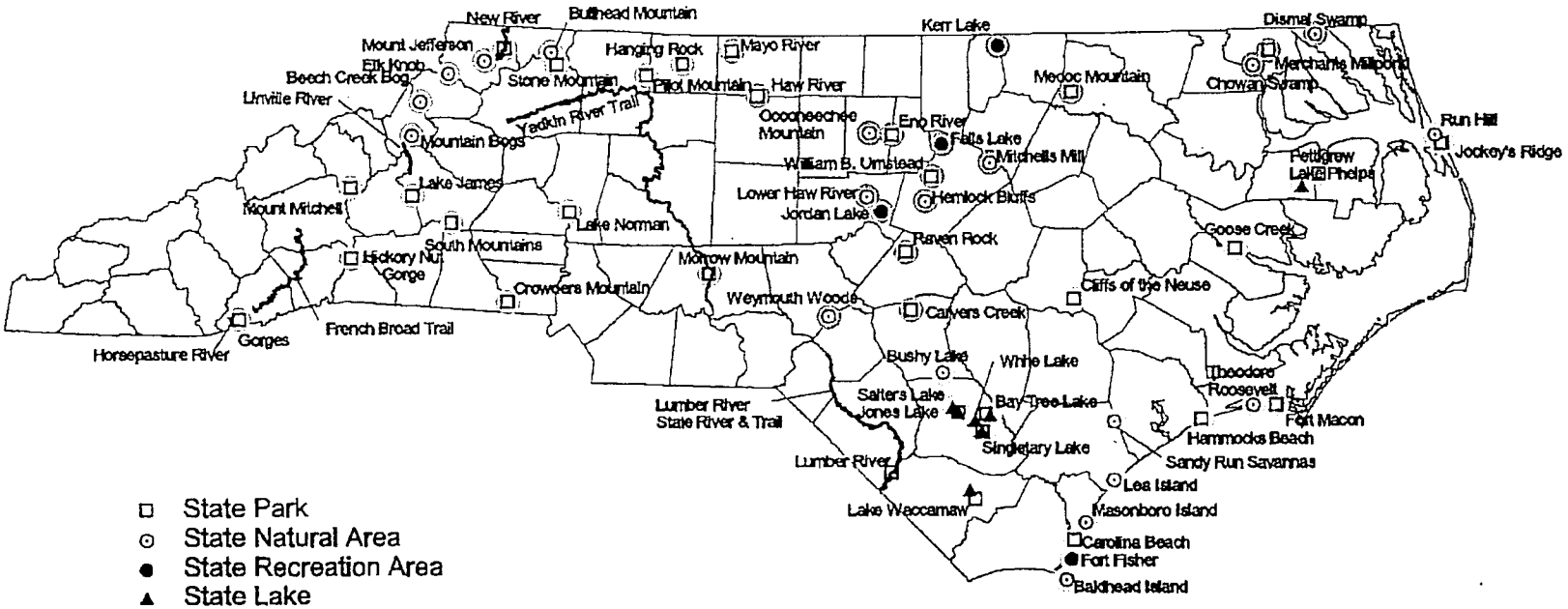
As a conservation agency, NCDPR is also concerned with impacts to marine and migratory wildlife in the naval OPAREAs seaward of the 3 nm state boundaries. Any such impacts potentially have repercussions for North Carolina's ecosystems and North Carolina residents' enjoyment of these natural resources. However, since these areas fall outside of state waters and most of these species are covered by federal law and international treaties, we defer to the National Marine Fisheries Service and the U.S. Fish and Wildlife Service on appropriate protection measures.

Thank you for the opportunity to review this proposal. We will look forward to more information so that we can better assess potential impacts to NCDPR holdings and state resources.

Sincerely,

Jean Lynch
Coastal Region Biologist
North Carolina Division of Parks and Recreation
P.O. Box 475
Carolina Beach, NC 28428-0475
Office: (910) 458-8206
Fax: (910) 409-5755

North Carolina
State Parks System



September 2006

NCDENR

North Carolina Department of Environment and Natural Resources

Division of Coastal Management

Michael F. Easley, Governor | **James H. Gregson, Director** | William G. Ross Jr., Secretary

MEMORANDUM

December 31, 2008

TO: Tere Barrett
Division of Coastal Management - Morehead
400 Commerce Avenue
Morehead City, NC 28557-3421

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Atlantic Fleet Training (VACAPES) (DCM#20080168)

LOCATION: Virginia Capes Range Complex (VACAPES), Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **January 23, 2009**. This is one of two projects the other being Jacksonville/Charleston Range Complexes. The State Clearinghouse previously sent both of these projects out for NEPA review. A copy of the DEIS is on the "T" drive which is accessible if you are within DCM, please see the next page for their location. If you need copies of the DEIS on CD, I can send one. (Steve, Tere, Terry, and Frank please respond directly or delegate.) Your responses will assist us in determining whether the proposed project would be consistent with the State's Coastal Management Program. If the proposed project does not conform to your requirements, please identify the measures that would be necessary to bring the proposed project into conformance. If you have any additional questions regarding the proposed project you may contact me at 252-808-2808.

REPLY

A No Comment.

____ This office supports the project as proposed.

____ Comments to this project are attached.

____ This office objects to the project as proposed.

Signed: Bruce Smith Date: 1/23/09

CORRECTIONS

Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM

to

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

NCDENR

North Carolina Department of Environment and Natural Resources

Division of Coastal Management

Michael F. Easley, Governor | **James H. Gregson, Director** | William G. Ross Jr., Secretary

MEMORANDUM

December 31, 2008

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RECEIVED

JAN 2 0 2009

Morehead City DCM

TO: Vivian Cristy (401 Water Quality)
DWQ - 401 Water Quality Certification (Washington)
NCDENR - Division of Water Quality
943 Washington Square Mall
Washington, NC 27889-1638

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Atlantic Fleet Training (VACAPES) (DCM#20080168)

LOCATION: Virginia Capes Range Complex (VACAPES), Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **January 23, 2009**. This is one of two projects the other being Jacksonville/Charleston Range Complexes. The State Clearinghouse previously sent both of these projects out for NEPA review. A copy of the DEIS is on the "T" drive which is accessible if you are within DCM, please see the next page for their location. If you need copies of the DEIS on CD, I can send one. (Steve, Tere, Terry, and Frank please respond directly or delegate.) Your responses will assist us in determining whether the proposed project would be consistent with the State's Coastal Management Program. If the proposed project does not conform to your requirements, please identify the measures that would be necessary to bring the proposed project into conformance. If you have any additional questions regarding the proposed project you may contact me at 252-808-2808.

REPLY

__✓__ No Comment.

_____ This office supports the project as proposed.

_____ Comments to this project are attached.

_____ This office objects to the project as proposed.

Signed: A. Hater Date: 1-15-09

CORRECTIONS

Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM

to

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

Sara

North Carolina Department of Environment and Natural Resources
Division of Coastal Management
Michael F. Easley, Governor | **James H. Gregson, Director** | William G. Ross Jr., Secretary

E 1/23/09

MEMORANDUM

December 31, 2008

TO: Anne Deaton
NCDENR - Division of Marine Fisheries
PO Box 769
Morehead City, NC 28557-0769

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Atlantic Fleet Training (VACAPES) (DCM#20080168)

LOCATION: Virginia Capes Range Complex (VACAPES), Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **January 23, 2009**. This is one of two projects the other being Jacksonville/Charleston Range Complexes. The State Clearinghouse previously sent both of these projects out for NEPA review. A copy of the DEIS is on the "T" drive which is accessible if you are within DCM, please see the next page for their location. If you need copies of the DEIS on CD, I can send one. (Steve, Tere, Terry, and Frank please respond directly or delegate.) Your responses will assist us in determining whether the proposed project would be consistent with the State's Coastal Management Program. If the proposed project does not conform to your requirements, please identify the measures that would be necessary to bring the proposed project into conformance. If you have any additional questions regarding the proposed project you may contact me at 252-808-2808.

REPLY

✓ AD No Comment.

✓ This office supports the project as proposed.

_____ Comments to this project are attached.

_____ This office objects to the project as proposed.

Signed: Anne Deaton Date: 1-12-09 1-20-09

CORRECTIONS

Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM

to

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

NCDENR

RECEIVED
JAN 5 2009
Morehead City DCM

North Carolina Department of Environment and Natural Resources
Division of Coastal Management
James H. Gregson, Director

Michael F. Easley, Governor

William G. Ross Jr., Secretary

MEMORANDUM

December 31, 2008

TO: Hannah Stallings
DWQ - Planning Section
NCDENR - Division of Water Resources
1617 Mail Service Center
Raleigh, NC 27699-1617

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Atlantic Fleet Training (VACAPES) (DCM#20080168)

LOCATION: Virginia Capes Range Complex (VACAPES), Offshore, North Carolina

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REPLY

X No Comment.

____ This office supports the project as proposed.

____ Comments to this project are attached.

____ This office objects to the project as proposed.

Signed: Hannah Stallings (DWQ) Date: January 9, 2009

CORRECTIONS

Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM

to

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

55

North Carolina Department of Environment and Natural Resources
Division of Coastal Management
Michael F. Easley, Governor — **James H. Gregson, Director** — William G. Ross Jr., Secretary

MEMORANDUM

December 31, 2008

TO: Patty Fowler
Shellfish Sanitation and Recreational Water Quality Section
NCDENR - Division of Environmental Health
PO Box 769
Morehead City, NC 28557-0769

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Atlantic Fleet Training (VACAPES) (DCM#20080168)

LOCATION: Virginia Capes Range Complex (VACAPES), Offshore, North Carolina

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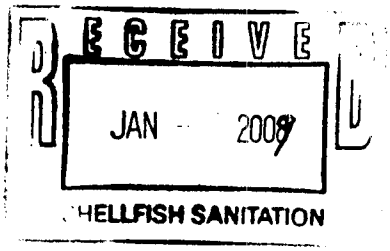
REPLY



X No Comment.

____ This office supports the project as proposed.

____ Comments to this project are attached.

____ This office objects to the project as proposed.

Signed: for P.H. Fowler Date: 1/5/09

CORRECTIONS

Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM

to

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

NCDENR

North Carolina Department of Environment and Natural Resources

Division of Coastal Management

Michael F. Easley, Governor | **James H. Gregson, Director** | William G. Ross Jr., Secretary

MEMORANDUM

December 31, 2008

TO: John Fear
Coastal Reserve Program - Beaufort
101 Pivers Island Road
Beaufort, NC 28516-9701

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Atlantic Fleet Training (VACAPES) (DCM#20080168)

LOCATION: Virginia Capes Range Complex (VACAPES), Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **January 23, 2009**. This is one of two projects the other being Jacksonville/Charleston Range Complexes. The State Clearinghouse previously sent both of these projects out for NEPA review. A copy of the DEIS is on the "T" drive which is accessible if you are within DCM, please see the next page for their location. If you need copies of the DEIS on CD, I can send one. (Steve, Tere, Terry, and Frank please respond directly or delegate.) Your responses will assist us in determining whether the proposed project would be consistent with the State's Coastal Management Program. If the proposed project does not conform to your requirements, please identify the measures that would be necessary to bring the proposed project into conformance. If you have any additional questions regarding the proposed project you may contact me at 252-808-2808.

REPLY

X No Comment.

____ This office supports the project as proposed.

____ Comments to this project are attached.

____ This office objects to the project as proposed.

Signed: John Fear Date: 1-7-09

CORRECTIONS

Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM

to

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

NCDENR

North Carolina Department of Environment and Natural Resources

Division of Coastal Management

Michael F. Easley, Governor | **James H. Gregson, Director** | William G. Ross Jr., Secretary

MEMORANDUM

December 31, 2008

CH 07-0941

TO: Renee Gledhill-Early
State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Atlantic Fleet Training (VACAPES) (DCM#20080168)

LOCATION: Virginia Capes Range Complex (VACAPES), Offshore, North Carolina

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REPLY

X No Comment.

____ This office supports the project as proposed.

____ Comments to this project are attached.

____ This office objects to the project as proposed.

Signed: Renee Gledhill-Early Date: 1-6-09

CORRECTIONS

Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM

to

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

NCDENR

North Carolina Department of Environment and Natural Resources

Division of Coastal Management

Michael F. Easley, Governor | **James H. Gregson, Director** | William G. Ross Jr., Secretary

MEMORANDUM

December 31, 2008

TO: Steve Everhart
Division of Coastal Management - Wlmington
127 Cardinal Drive Extension
Wilmington, NC 28405-5406

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Atlantic Fleet Training (VACAPES) (DCM#20080168)

LOCATION: Virginia Capes Range Complex (VACAPES), Offshore, North Carolina

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REPLY

✓ No Comment.

____ This office supports the project as proposed.

____ Comments to this project are attached.

____ This office objects to the project as proposed.

Signed: [signature] Date: 1/7/09

CORRECTIONS

Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM

to

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

NCDENR

North Carolina Department of Environment and Natural Resources

Division of Coastal Management

Michael F. Easley, Governor | **James H. Gregson, Director** | William G. Ross Jr., Secretary

MEMORANDUM

C.09.01.05.02

December 31, 2008

RECEIVED
JAN 23 2009
Morehead City DCM

TO: Maria Dunn
Division of Inland Fisheries, Habitat Conservation Program
NC Wildlife Resources Commission
943 Washington Square Mall
Washington, NC 27889-1638

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Atlantic Fleet Training (VACAPES) (DCM#20080168)

LOCATION: Virginia Capes Range Complex (VACAPES), Offshore, North Carolina

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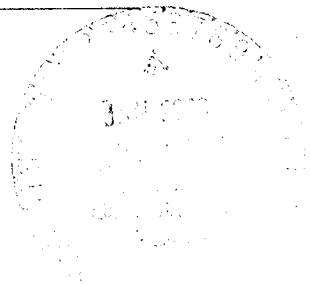
REPLY



____ No Comment.

____ This office supports the project as proposed.

____ Comments to this project are attached.

____ This office objects to the project as proposed.

Signed: Maria T. Dunn Date: 1-23-2009

CORRECTIONS

Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM

to

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

NCDENR

North Carolina Department of Environment and Natural Resources

Division of Coastal Management

Michael F. Easley, Governor | **James H. Gregson, Director** | William G. Ross Jr., Secretary

MEMORANDUM

December 31, 2008

TO: Frank Jennings
Division of Coastal Management - Elizabeth City
1367 US 17 South
Elizabeth City, NC 27909-7634

FROM: Stephen Rynas, AICP; Federal Consistency Coordinator

SUBJECT: Proposed Atlantic Fleet Training (VACAPES) (DCM#20080168)

LOCATION: Virginia Capes Range Complex (VACAPES), Offshore, North Carolina

This document is being circulated for **consistency** review and comment by **January 23, 2009**. This is one of two projects the other being Jacksonville/Charleston Range Complexes. The State Clearinghouse previously sent both of these projects out for NEPA review. A copy of the DEIS is on the "T" drive which is accessible if you are within DCM, please see the next page for their location. If you need copies of the DEIS on CD, I can send one. (Steve, Tere, Terry, and Frank please respond directly or delegate.) Your responses will assist us in determining whether the proposed project would be consistent with the State's Coastal Management Program. If the proposed project does not conform to your requirements, please identify the measures that would be necessary to bring the proposed project into conformance. If you have any additional questions regarding the proposed project you may contact me at 252-808-2808.

REPLY

✓ No Comment.

____ This office supports the project as proposed.

____ Comments to this project are attached.

____ This office objects to the project as proposed.

Signed: Frank Jennings Date: 1-30-9

CORRECTIONS

Please identify any corrections, additions, or deletions that should be made in terms of contact information.

RETURN COMPLETED FORM

to

Stephen Rynas, Federal Consistency Coordinator
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

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APPENDIX H

OVERVIEW OF AIRBORNE AND UNDERWATER ACCOUSTICS

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APPENDIX H
OVERVIEW OF AIR4BORNE AND UNDERWATER ACOUSTICS

TABLE OF CONTENTS

H.1 INTRODUCTION

This appendix provides additional information on the characteristics of in-air and underwater noise. Sound transmission characteristics are different for sounds in air versus sounds in water. Similarly, sound reception sensitivities vary for in-air sound and in-water sound. Therefore, this appendix is divided into two major subsections: Airborne Noise Characteristics and Underwater Noise Characteristics. A third subsection describes sound transmission through the air-water interface. Underwater ambient noise is partially a result of sound sources that occur outside the VACAPES Range Complex. However, for the purposes of this Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS), the region of influence for underwater noise is limited to airborne and underwater sound sources that occur primarily within the VACAPES Range Complex boundaries. Full citations for the literature cited in this appendix are provided in Chapter 6 of the EIS/OEIS.

H.2 AIRBORNE NOISE CHARACTERISTICS

Primary sources of airborne noise in the VACAPES Range Complex include aircraft and their weapons, naval gunfire, aerial targets, and airborne ordnance (e.g., missiles). Throughout this section, the F/A-18 aircraft is used to represent typical jet aircraft that operate in the VACAPES Range Complex. For the purpose of noise characterization, aerial targets and airborne ordnance are essentially small-scale aircraft.

Two distinct types of noise may result from aircraft operations. When an aircraft flies slower than the speed of sound or subsonically, noise is produced by the aircraft's engine and by effects of aircraft movement through air. When an aircraft flies faster than the speed of sound, a sharply defined shock front is created, producing a distinct phenomenon called "overpressure." Noise produced by this physical phenomenon is termed "impulse noise." Thunder claps, noise from explosions, and sonic booms are examples of impulse noise. Airborne noise that originates in higher altitudes is seldom heard on the ground. This is due to the upward bending of sound that takes place in temperature inversions, where the surface temperature is warmer than the temperature at the higher altitude of the sound source. The characteristics of subsonic and supersonic noise are discussed below.

H.2.1 SUBSONIC NOISE

The physical characteristics of noise (or sound) include its intensity, frequency, and duration. Sound is created by acoustic energy, which produces pressure waves that travel through a medium, like air or water, and are sensed by the eardrum. This may be likened to ripples in water that would be produced when a stone is dropped into it. As acoustic energy increases, the intensity or height of these pressure waves increases, and the ear senses louder noise. The ear is capable of responding to an enormous range of sound levels, from that of a soft whisper to the roar of a rocket engine.

Units of Measurement

The range of sound levels humans are capable of hearing is very large. If the faintest sound level recognized (threshold of hearing) is assigned a value of one, then the highest level capable of being heard (threshold of pain), measured on the same scale, would have a value of 10 million. To make this large range of values more meaningful, a logarithmic mathematical scale is used: the decibel [dB] scale. On this scale, the lowest level audible to humans is 0 dB and the threshold of pain is approximately 140 dB. The reference level for the decibel scale used to describe airborne sound is, thus, the threshold of hearing (for young adults). In physical terms, this corresponds to a sound pressure of 20 micro Pascals (μPa). Atmospheric pressure is about 100,000 Pa.

Noise Measurement (weighting)

The normal human ear can detect sounds that range in frequency from about 20 cycles per second (or Hertz (Hz)) to 15,000 Hz. However, all sounds throughout this range are not heard equally well. Figure H.1 shows the in-air hearing threshold curve (audiogram) for humans. The human ear is most sensitive at 1 to 4 kilohertz (kHz).

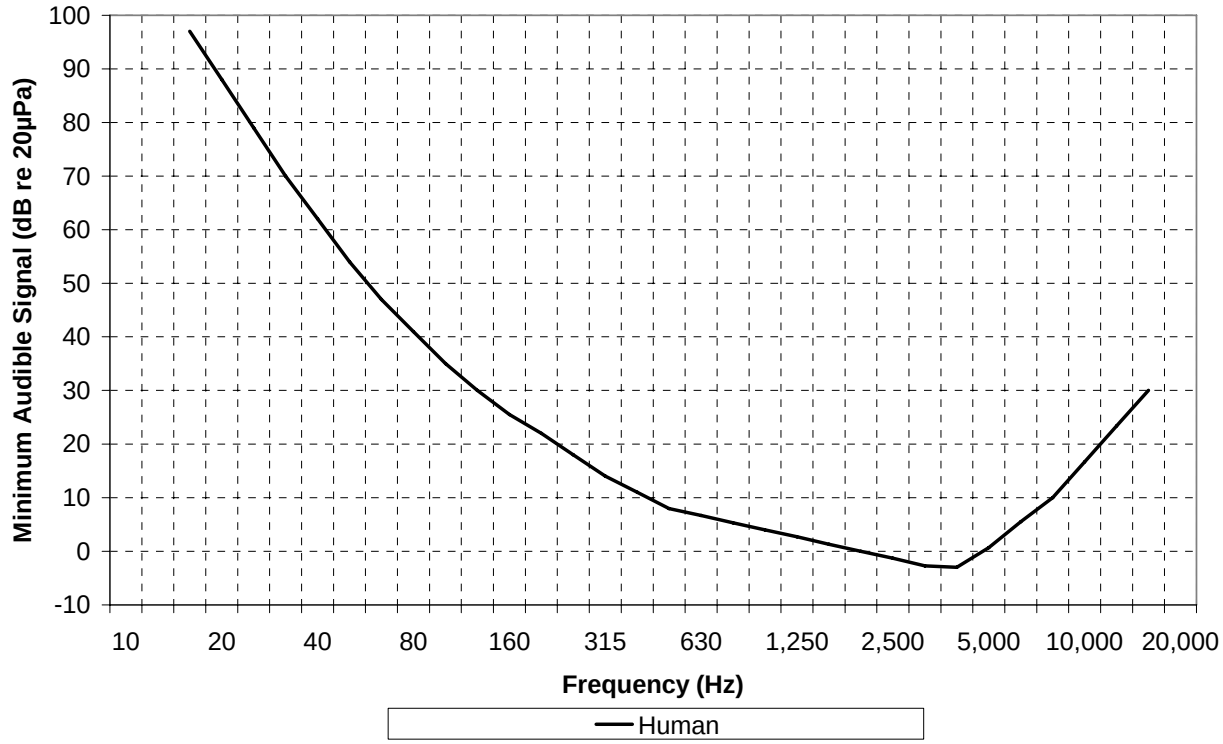


Figure H.1 Human In-Air Hearing Threshold

Sound level meters have been developed to measure sound fields and to show the sound level as a number proportional to the overall sound pressure as measured on the logarithmic scale described previously. This is called the sound pressure level. It is often useful to have this meter provide a number that is directly related to the human sensation of loudness. Therefore, some sound meters are calibrated to emphasize frequencies in the 1 to 4 kHz range and to de-emphasize higher and especially lower frequencies to which humans are less sensitive. Sound level measurements obtained with these instruments are termed "A-weighted" (expressed in dBA). The A-weighting function is shown in Figure H.2. It is closely related to the human hearing characteristic shown previously in Figure H.1. Because other animals are sensitive to a different range of frequencies, various other weighting protocols may be more appropriate when their specific hearing characteristics are known. Alternative measurement procedures such as C-weighting or flat-weighting (unweighted), which do not de-emphasize lower frequencies, may be more appropriate for various animal species such as the baleen whale.

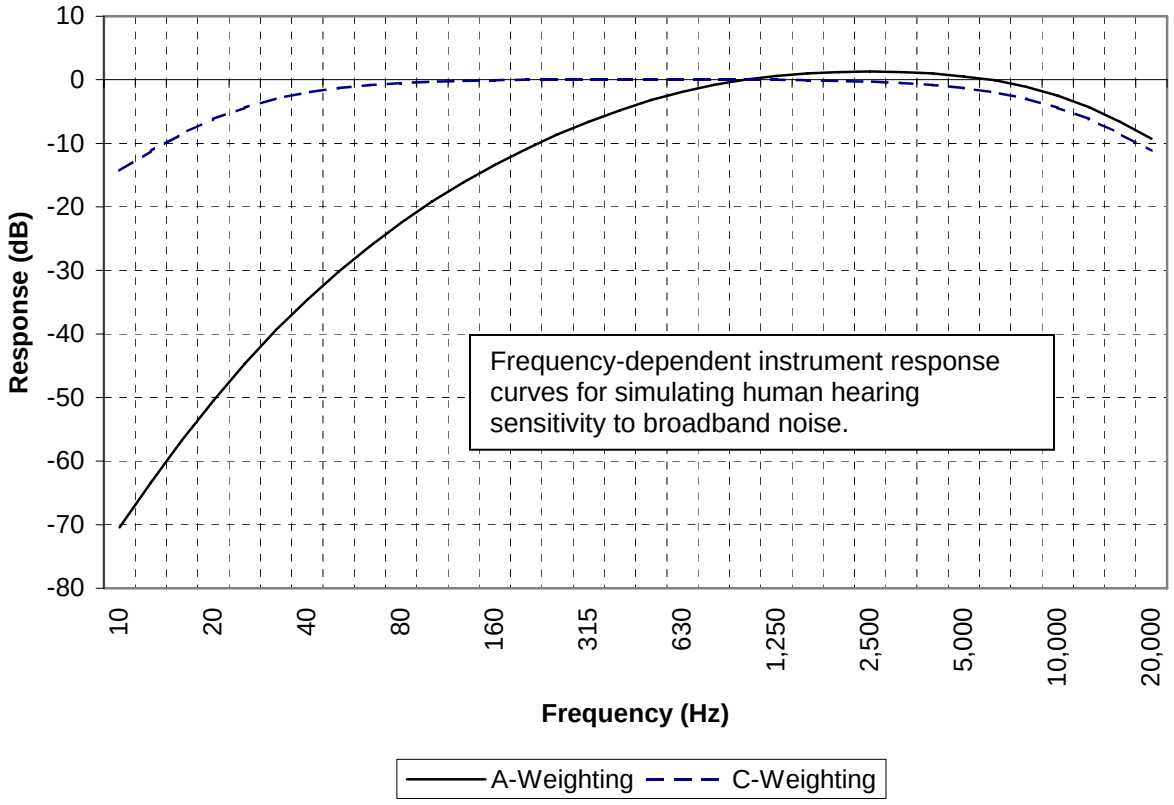


Figure H.2 Noise Weighting Characteristics

Although sound is often measured with instruments that record instantaneous sound levels in dB, the duration of a noise event and the number of times noise events occur are also important considerations in assessing noise impacts. With these measurements, sound levels for individual noise events and average sound levels, in decibels, over extended periods of hours, days, months, or years can be calculated (e.g., the daily day-night average sound level [L_{dn}] in dB).

Sound Exposure Level (Single Noise Event)

The sound exposure level (SEL) measurement provides a means of describing a single, time varying, noise event. It is useful for quantifying events such as an aircraft overflight, which includes the approach when noise levels are increasing, the instant when the aircraft is directly overhead with maximum noise

level, and the period of time while the aircraft moves away with decreasing noise levels. SEL is a measure of the physical energy of a noise event, taking into account both intensity (loudness) and duration. SEL is based on the sounds received during the period while the level is above a specified threshold that is at least 10 dB below the maximum value measured during a noise event. SEL is usually determined on an A-weighted basis, and is defined as the constant sound level that provides the same amount of acoustic exposure in one second as the actual time-varying level for the exposure duration. It can also be expressed as the one-second averaged equivalent sound level (L_{eq} 1 sec).

Table H.1 provides a brief comparison of A-weighted, C-weighted, and flat SEL (F-SEL) values for military aircraft operating at various altitudes and power settings. By definition, SEL values are normalized to a reference time of 1 second and should not be confused with either the average or maximum noise levels associated with a specific event. There is no general relationship between the SEL value and the maximum decibel level measured during a noise event. By definition, SEL values exceed the maximum decibel level where noise events have durations greater than one second. For subsonic aircraft overflights, maximum noise levels are typically 5 to 7 dB below SEL values.

Table H.1 SEL Comparison for Select Department of Defense Aircraft (in dB)

	P-3			F/A-18		
Power Setting	2000 ESHP			88% RPM		
Speed (knots)	180			400		
Altitude	**A-SEL**	**C-SEL**	**F-SEL**	**A-SEL**	**C-SEL**	**F-SEL**
2,500 feet	83.5	88.4	88.4	91.3	95.3	95.2
2,000 feet	85.6	90.0	90.0	93.7	97.4	97.3
1,600 feet	87.7	91.6	91.6	96.0	99.4	99.4
1,000 feet	91.7	94.7	94.7	100.2	103.2	103.2
500 feet	97.2	99.2	99.3	105.9	108.5	108.5
315 feet	100.6	102.2	102.2	109.3	111.7	111.8
200 feet	103.9	105.1	105.2	112.5	114.8	114.9

ESHP – effective shaft horsepower
RPM – revolutions per minute

Day-Night Average Sound Level

The day-night average sound level (L_{dn} or DNL[1]) is the energy-averaged sound level measured over a 24-hour period, with a 10 dB penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. DNL values are obtained by summation and averaging of SEL values for a given 24-hour period. DNL is the preferred noise metric of the U.S. Department of Housing and Urban Development, Federal Aviation Administration, U.S. Environmental Protection Agency, and Department of Defense insofar as potential effects of airborne sound on humans are concerned.

People are constantly exposed to noise. Most people are exposed to average sound levels of 50 to 55 L_{dn} or higher for extended periods on a daily basis. Normal conversational speaking produces received sound levels of approximately 60 dBA. Studies specifically conducted to determine noise impacts on various human activities show that about 90 percent of the population is not significantly bothered by outdoor average sound levels below 65 L_{dn} (Federal Aviation Administration, 1985).

[1] L_{dn} is the formula version of the Day-Night Average Sound Level metric and DNL is normally used in text.

DNL considers noise levels of individual events that occur during a given period, the number of events, and the times (day or night) at which events occur. Since noise is measured on a logarithmic scale, louder noise events dominate the average. To illustrate this, consider a case in which only one aircraft flyover occurs in daytime during a 24-hour period, and creates a sound level of 100 dB for 30 seconds. During the remaining 23 hours, 59 minutes, and 30 seconds of the day, the ambient sound level is 50 dB. The calculated sound level for this 24-hour period is 65.5 L_{dn}. To continue the example, assume that 10 such overflights occur during daytime hours during the next 24-hour period, with the same 50 dB ambient sound level during the remaining 23 hours and 55 minutes. The calculated sound level for this 24-hour period is 75.4 L_{dn}. Clearly, the averaging of noise over a given period does not suppress the louder single events.

In calculating DNL, noise associated with aircraft operations is considered, and a 10 dB penalty is added to operations that occur between 10:00 p.m. and 7:00 a.m.; this time period is considered nighttime for the purposes of noise modeling. The 10 dB penalty is intended to compensate for generally lower background noise levels and increased human annoyance associated with noise events occurring between the hours of 10:00 p.m. and 7:00 a.m.

While DNL does provide a single measure of overall noise, it does not provide specific information on the number of noise events or specific individual sound levels that occur. For example, as explained above, an DNL of 65 dB could result from very few, but very loud events, or a large number of quieter events. Although it does not represent the sound level heard at any one particular time, it does represent total sound exposure. Scientific studies and social surveys have found DNL to be the best measure to assess levels of human annoyance associated with all types of environmental noise. Therefore, its use is endorsed by the scientific community and governmental agencies (U.S. Environmental Protection Agency, 1974; Federal Interagency Committee on Urban Noise, 1980; Federal Interagency Committee on Noise, 1992).

Onset-Rate Adjusted Day-Night Average Sound Level

Aircraft operating at low altitude and in special use airspace generate noise levels different from other community noise environments. Overflights can be sporadic, which differ from most community environments where noise tends to be continuous or patterned.

Military overflight events also differ from typical community noise events because of the low altitude and high airspeed characteristics of military aircraft. These characteristics can result in a rate of increase in sound level (onset rate) of up to 30 dB per second. To account for the random and often sporadic nature of military flight activities, computer programs calculate noise levels created by these activities based on a monthly, rather than a daily, period. The DNL metric is adjusted to account for the surprise, or startle effect, of the onset rate of aircraft noise on humans. Onset rates above 30 dB per second require an 11 dB penalty because they may cause a startle associated with the rapid noise increase. Onset rates from 15 to 30 dB per second require an adjustment of 0 to 11 dB. Onset rates below 15 dB per second require no adjustment because no startle is likely. The adjusted L_{dn} is designated as onset-rate adjusted monthly day-night average sound level (L_{dnmr}).

H.2.2 SUPERSONIC NOISE

A sonic boom is the noise a person, animal, or structure on the earth's surface receives when an aircraft or other type of air vehicle flies overhead faster than the speed of sound (or supersonic). The speed of sound is referred to as Mach 1. This term, instead of a specific velocity, is used because the speed at which sound travels varies for different temperatures and pressures. For example, the speed of sound in air at standard atmospheric conditions at sea level is about 772 statute miles per hour, or 1,132 feet per second (fps). However, at an altitude of 25,000 feet, with its associated lower temperature and pressure, the speed of sound is reduced to 1,042 fps (approximately 710 miles per hour). Thus, regardless of the

absolute speed of the aircraft, when it reaches the speed of sound in the environment in which it is flying, its speed is Mach 1.

Air reacts like a fluid to supersonic objects. When an aircraft exceeds Mach 1, air molecules are pushed aside with great force, forming a shock front much like a boat creates a bow wave. All aircraft generate two shock fronts. One is immediately in front of the aircraft; the other is immediately behind it. These shock fronts "push" a sharply defined surge in air pressure in front of them. When the shock fronts reach the ground, the result is a sonic boom. Actually, a sonic boom involves two very closely spaced impulses, one associated with each shock front. Most people on the ground cannot distinguish between the two and they are usually heard as a single sonic boom. However, the paired sonic booms created by vehicles that are the size and mass of the space shuttle are very distinguishable, and two distinct booms are easily heard.

Sonic booms differ from most other sounds because: (1) they are impulsive; (2) there is no warning of their impending occurrence; and (3) the peak levels of a sonic boom are higher than those for most other types of outdoor noise. Although air vehicles exceeding Mach 1 always create a sonic boom, not all sonic booms are heard on the ground. As altitude increases, air temperature normally decreases, and these layers of temperature change cause the shock front to be turned upward as it travels toward the ground. Depending on the altitude of the aircraft and the Mach number, the shock fronts of many sonic booms are bent upward sufficiently that they never reach the ground. This same phenomenon also acts to limit the width (area covered) of those sonic booms that actually do reach the ground.

Sonic booms are sensed by the human ear as an impulsive (sudden or sharp) sound because they are caused by a sudden change in air pressure. The change in air pressure associated with a sonic boom is generally a few pounds per square foot, which is about the same pressure change experienced riding an elevator down two or three floors. It is the rate of change - the sudden onset of the pressure change - that makes the sonic boom audible. The air pressure in excess of normal atmospheric pressure is referred to as "overpressure." It is quantified on the ground by measuring the peak overpressure in pounds per square foot (psf) and the duration of the boom in milliseconds. The overpressure sensed is a function of the distance of the aircraft from the observer; the shape, weight, speed, and altitude of the aircraft; local atmospheric conditions; and location of the flight path relative to the surface. The maximum overpressures normally occur directly under the flight track of the aircraft and decrease as the slant range, or distance, from the aircraft to the receptor increases. Supersonic flights for a given aircraft type at high altitudes typically create sonic booms that have low overpressures but cover wide areas.

The noise associated with sonic booms is measured on a C-weighted scale (as shown previously in Figure H.2). C-weighting provides less attenuation at low frequencies than A-weighting. This is appropriate based on the human auditory response to the low frequency sound pressures associated with high-energy impulses (such as those generated by sonic booms).

H.2.3 AIRBORNE NOISE EFFECTS ON WILDLIFE

The previous discussion primarily concerned the metrics that have been developed to predict human response to various noise spectral and temporal characteristics. Response prediction metrics for non-human species such as marine mammals are generally not available, except in a limited form for a few examples such as gray and humpback whales, whose responses to industrial noise playbacks and vessel traffic have been studied. Some studies of response to impulse noise in the form of air gun signals have also been made. Those sounds are underwater sounds. Although several studies of pinniped response to airborne noise and sonic booms from aircraft and missile flyovers have been made, few sound exposure data have been reported.

Because of the limited amount of response data available for marine mammals, it is not possible to develop total sound exposure metrics similar to those applied to human population centers. Instead, the

potential impacts of noise sources in the VACAPES Range Complex need to be assessed by examining individual source-receiver encounter scenarios typical of range operations.

A wide variety of noise sources must be considered in assessing the potential impact of airborne noise sources in the VACAPES Range Complex on non-human species. It is necessary to provide an overall sound level measure that is proportional to the sound level perceived by a given species. This facilitates the application of sound level criteria based on potential avoidance behavior, potential temporary threshold shift, or some other appropriate response (refer to Section 3.6 of the EIS/OEIS, Marine Mammals). A weighting function related to the hearing characteristics of a specific species is required, analogous to the A-weighting used for human response prediction.

H.2.4 AMBIENT NOISE

Ambient noise is the background noise at a given location. Airborne ambient noise can vary considerably depending on location and other factors, such as wind speed, temperature stratification, terrain features, vegetation, and the presence of distant natural or man-made noise sources.

In predicting human response to loud airborne noise sources, it is reasonable to assume that ambient background noise would have little or no effect on the calculated noise levels since the ambient levels would add insignificant fractions to calculated values. Therefore, ambient background noise is not considered in noise calculations.

Ambient noise may have a more significant effect on prediction of marine mammal response to loud airborne noise sources. Marine mammals are exposed to a wide range of ambient sounds ranging from the loud noise of nearby wave impacts to the quiet of remote areas during calm wind conditions. The ambient noise background on beaches is strongly influenced by surf noise. Some examples of airborne noise levels in human and marine mammal habitat are given in Table H.2.

It should be noted that the characteristics of subsonic noise, which is measured on an A-weighted scale, and supersonic noise, which is measured on a C-weighted scale, are different. Therefore, each is calculated separately, and it would be incorrect to add the two values together. Nevertheless, both subsonic and supersonic noises occur in the VACAPES Range Complex. Together, they form the cumulative acoustic environment in the region. Therefore, each is addressed where applicable in this EIS/OEIS.

Table H.2 Representative Airborne Noise Levels

Source of Noise	dBA re 20 µPa
F/A-18 at 1,000 feet (Cruise Power)	98
Helicopter at 200 feet (UH-1N)	91
Car at 25 feet (60 mph) [1]	70 - 80
Light Traffic at 100 feet [1]	50 - 60
Quiet Residential (daytime) [1]	40 - 50
Quiet Residential (night) [1]	30 - 40
Wilderness Area [1]	20 - 30
Offshore (low sea state) [2]	40 - 50
Surf [2]	60 - 70

[1] Kinsler, et al., 1982.
[2] U.S. Coast Guard, 1960.

H.3 SOUND TRANSMISSION THROUGH THE AIR-WATER INTERFACE

Many of the sound sources considered in this EIS/OEIS are airborne vehicles, but a significant portion of the concern about noise impacts involves marine animals at or below the surface of the water. Thus, transmission of airborne sound into the ocean is a significant consideration. This section describes some basic characteristics of air-to-water transmission of sound for both subsonic and supersonic sources.

H.3.1 SUBSONIC SOURCES

Sound is transmitted from an airborne source to a receiver underwater by four principal means: (1) a direct path, refracted upon passing through the air-water interface; (2) direct-refracted paths reflected from the bottom in shallow water; (3) lateral (evanescent) transmission through the interface from the airborne sound field directly above; and (4) scattering from interface roughness due to wave motion.

Several papers are available in the literature concerning transmission of sound from air into water. Urick (1972) presents a discussion of the effect and reports data showing the difference in the underwater signature of an aircraft overflight for deep and shallow conditions. The study includes analytic solutions for both the direct and lateral transmission paths and presents a comparison of the contributions of these paths for near-surface receivers. Young (1973) presents an analysis which, while directed at deep-water applications, derived an equivalent dipole underwater source for an aircraft overflight that can be used for direct path underwater received level estimates. A detailed description of air-water sound transmission is given in Richardson, *et al.* (1995). The following is a short summary of the principal features.

Figure H.3 shows the general characteristics of sound transmission through the air-water interface. Sound from an elevated source in air is refracted upon transmission into water because of the difference in sound speeds in the two media (a ratio of about 0.23). Because of this difference, the direct sound path is totally reflected for grazing angles less than 77°, i.e., if the sound reaches the surface at an angle more than 13° from vertical. For smaller grazing angles, sound reaches an underwater observation point only by scattering from wave crests on the surface, by non-acoustic (lateral) pressure transmission from the surface, and from bottom reflections in shallow water. As a result, most of the acoustic energy transmitted into the water from a source in air arrives through a cone with a 26° apex angle extending vertically downward from the airborne source. For a moving source, the intersection of this cone with the surface traces a "footprint" directly beneath the path of the source, with the width of the footprint being a function of the altitude of the source. To a first approximation, it is only the sound transmitted within this footprint that can reach an underwater location by a direct-refracted path. Because of the large difference in the acoustic properties of water and air, the pressure field is actually doubled at the surface of the water, resulting in a 6 dB increase in pressure level at the surface. Within the direct-refracted cone, the in-air sound transmission paths are affected both by geometric spreading and by the effects of refraction.

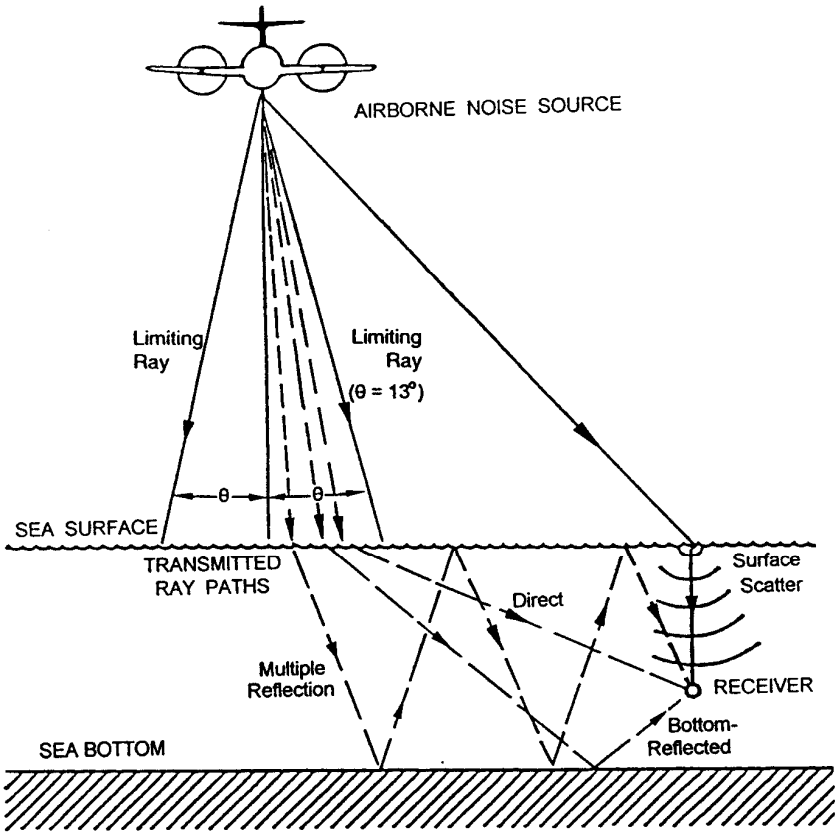


Figure H.3 Characteristics of Sound Transmission through Air-Water Interface

In shallow water within the direct transmission cone, the directly transmitted sound energy is generally greater than the energy contribution from bottom-reflected paths. At horizontal distances greater than the water depth, the energy transmitted by reflected paths becomes dominant, especially in shallow water. The ratio of direct to reverberant energy depends on the bottom properties. For hard bottom conditions the reverberant field persists for longer ranges than the direct field. However, with increasing horizontal distance from the airborne source, underwater sound diminishes more rapidly than does the airborne sound.

Near the surface, the laterally transmitted pressure from the airborne sound is transmitted hydrostatically underwater. Beyond the direct transmission cone this component can produce higher levels than the underwater-refracted wave. However, the lateral component is very dependent on frequency and thus on acoustic wavelength. The level received underwater is 20 dB lower than the airborne sound level at a depth equal to 0.4 wavelength.

For this application, it is necessary to have an analytical model to predict the total acoustic exposure level experienced by marine mammals near the surface and at depth near the path of an aircraft overflight. Malme and Smith (1988) describe a model to calculate the acoustic energy at an underwater receiver in shallow water, including the acoustic contributions of both the direct sound field (Urick, 1972) and a depth-averaged reverberant sound field (Smith, 1974).

In the present application, the Urick (1972) analysis for the lateral wave field was also included to predict this contribution. The paths of most concern for this application are the direct-refracted path and the lateral path. These paths will likely determine the highest sound level received by mammals located nearly directly below a passing airborne source and mammals located near the surface, but at some distance away from the source track. In shallow areas near shore, bottom-reflected acoustic energy will also contribute to the total noise field, but it is likely that the direct-refracted and lateral paths will make the dominant contributions.[2]

Figure H.4 shows an example of the model prediction for a representative source-receiver geometry. The transmission loss (TL) for the direct-refracted wave, the lateral wave, and their resultant energy-addition total is shown. Directly under the aircraft, the direct-refracted wave is seen to have the lowest TL. For the shallowest receiver at a 3-foot depth, the lateral wave is seen to become dominant at about a horizontal range of 40 feet. Beyond this point the underwater level is controlled by the sound level in the air directly above the receiver and follows the same decay slope with distance. For the deeper receiver at 10 feet, the lateral wave does not become dominant until the horizontal range is about 130 feet. When sound reaches the receiver via the direct-refracted path, it decays at about 12 dB/distance doubled (dd), consistent with a surface dipole source. In contrast, when the sound reaches the receiver via the lateral path, it decays at about 6 dB/dd, consistent with the airborne monopole source. Underneath the aircraft, the drop in sound level with depth change from 3 to 10 feet is only about 2 dB, but beyond about 200 feet, a 12 dB drop occurs for the same change in depth.

[2]The bottom-reflected reverberant sound field section of this model for nearshore applications requires detailed knowledge of bottom slope and bottom composition. In view of the requirements of this application, this level of detail is not appropriate and the reflected path subroutine was not used.

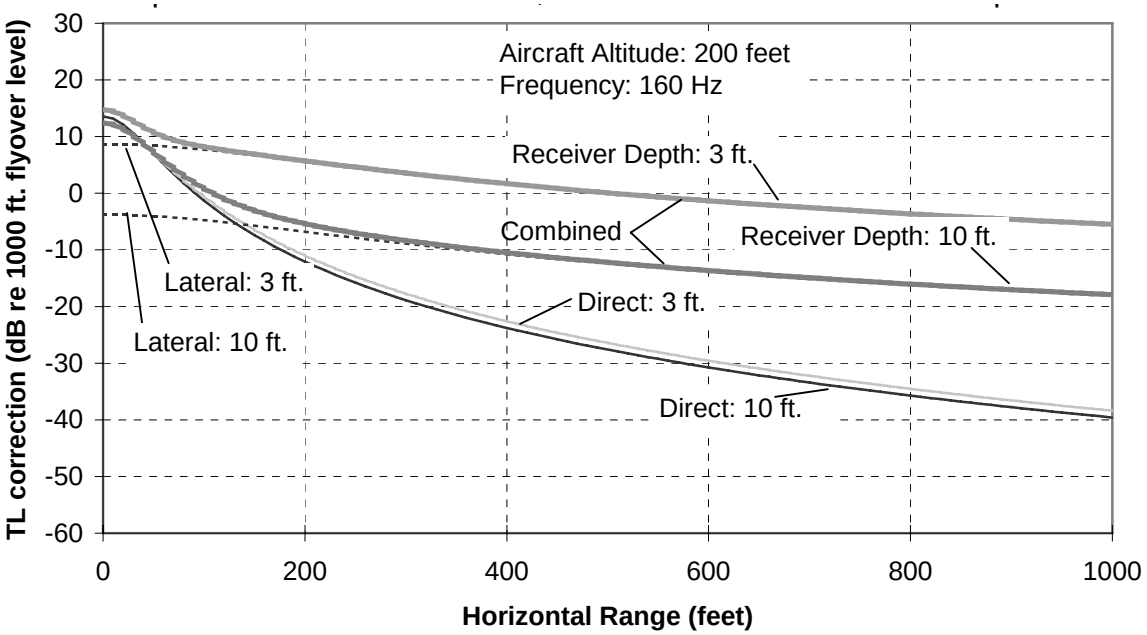


Figure H.4 Transmission of Loss of Noise through Air-Water Interface, Comparison of Direct-Refracted, Lateral and Combined TL Component

Figures H.5A-C illustrate the interaction between the various parameters for different sets of variables. For clarity, only the total transmission loss curves are shown in these figures. Figure H.5A shows the influence of frequency (wavelength) change on transmission loss. Here the loss at a depth of 3 feet can be seen to increase significantly with frequency in the region where the lateral wave is dominant. Thus, marine mammals near the surface will benefit from high frequency attenuation when they are not directly below the source track. Figure H.5B shows the change in TL with receiver depth for low frequency sound. Near the source track, a 6 dB drop in level occurs for a change in depth from 1 to 30 feet, but beyond a horizontal range of 200 feet, there is a 20 to 30 dB drop in level for the same change in receiver depth. Note, however, that for an increase in depth from 30 to 300 feet, the received level increases because of the effective source directionality. Figure H.5C shows the effect of increasing the aircraft altitude. In this case the region near the source track is affected the most with about a 38 dB drop in level for an altitude change of 50 feet to 5,000 feet. At a horizontal range of 200 feet, this drop is about 20 dB, with a decrease to 15 dB at 500 feet.

For a passing airborne source, received level at and below the surface diminishes with increasing source altitude, but the duration of exposure increases. The maximum received levels at and below the surface are inversely proportional to source altitude, but total noise energy exposure is inversely proportional to the product of source altitude and speed because of the link between altitude and duration of exposure.

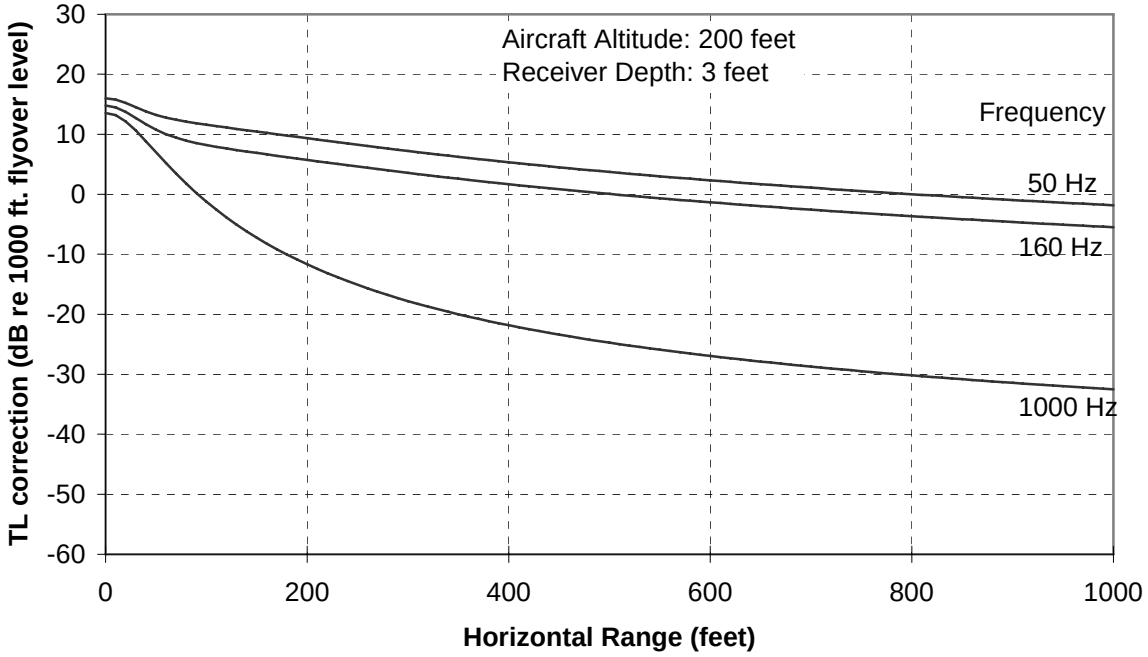


Figure H.5A Air-Water Transmission Loss vs. Frequency

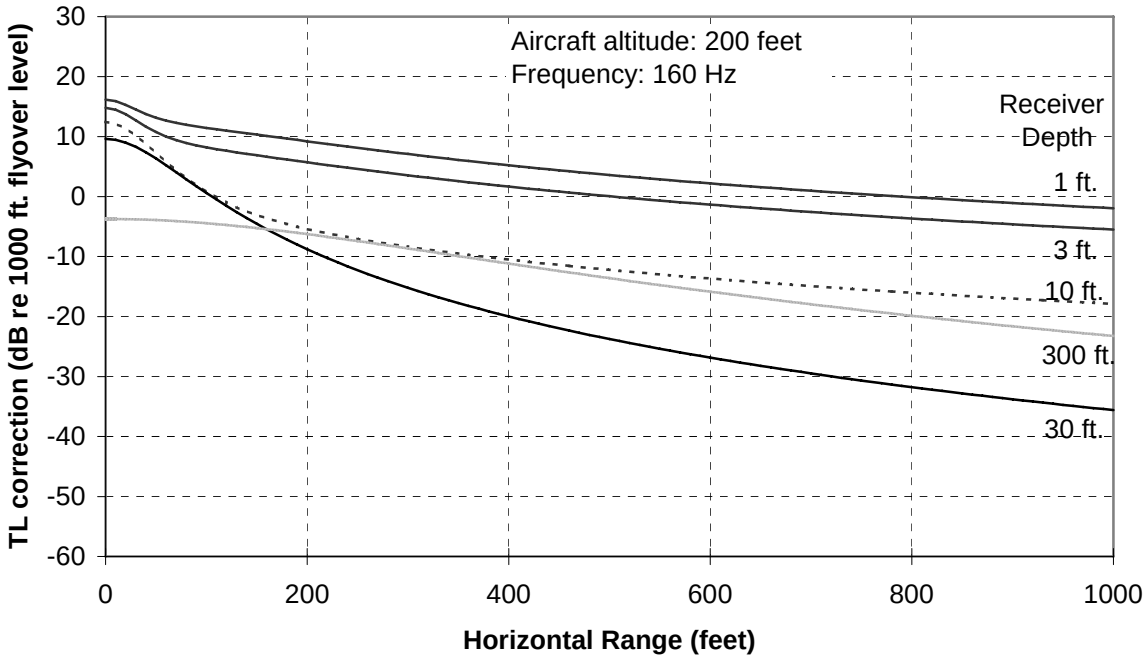


Figure H.5B Air-Water Transmission Loss vs. Receiver Depth

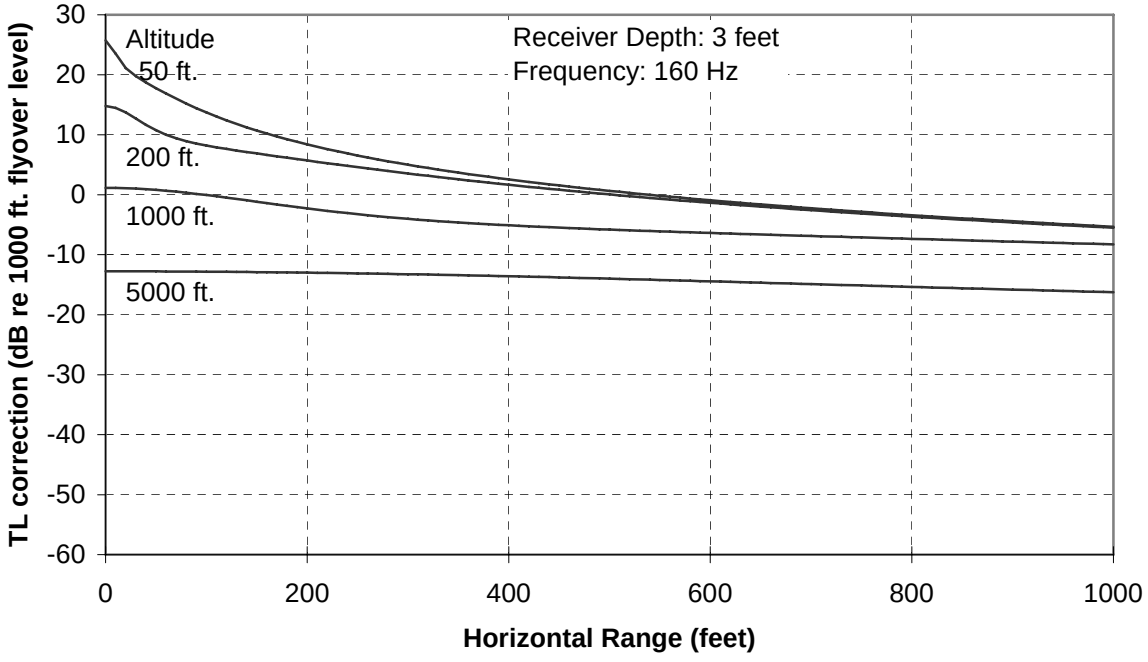


Figure H.5C Air-Water Transmission Loss vs. Aircraft Altitude

H.3.2 SUPERSONIC SOURCES

The sonic boom footprint produced by a supersonic aircraft in level flight at constant speed traces a hyperbola on the sea surface. The apex of the hyperbola moves at the same speed and direction as the aircraft with the outlying arms of the hyperbola traveling at increasing oblique angles and slower speeds until the boom shock wave dissipates into a sonically propagating pressure wave at large distances from the flight path. The highest boom overpressures at the water surface are produced directly below the aircraft track. In this region the pressure-time pattern is described as an "N-wave" because of its typical shape. Aircraft size, shape, speed, and altitude determine the peak shock pressure and time duration of the N-wave. The incidence angle of the N-wave on the water surface is determined by the aircraft speed, i.e., for Mach 2 the incidence angle is 45°. Thus, for air vehicles in level flight at speeds less than about Mach 4.3, the N-wave is totally reflected from the surface. Dives and other maneuvers at supersonic speeds of less than Mach 4.3 can generate N-waves at incidence angles that are refracted into the water, but the water source regions affected by these transient events are limited. Since the aircraft, missiles, and targets used in range activities generally operate at less than Mach 4.3, sonic boom penetration into the water from these sources occurs primarily by lateral (evanescent) propagation. Analyses by Sawyers (1968) and Cook (1969) show that the attenuation rate (penetration) of the boom pressure wave is related to the size, altitude, and speed of the source vehicle. The attenuation of the N-wave is not related to the length of the signature in the simple way that the lateral wave penetration from subsonic sources is related to the dominant wavelength of their signature. Specific examples will be given for the supersonic vehicles used in range tests as appropriate in this EIS/OEIS.

H.4 UNDERWATER NOISE CHARACTERISTICS

Many of the general characteristics of sound and its measurement were discussed in the introduction to airborne noise characteristics. This section expands on this introduction to summarize the properties of underwater noise that are relevant to understanding the effects of noise produced by range activities on the underwater marine environment in the VACAPES Range Complex area. Since the effect of underwater noise on human habitat is not an issue (except perhaps for divers), the primary environmental concern that is addressed is the potential impact on marine mammals.

H.4.1 UNITS OF MEASUREMENT

The reference level for airborne sound is 20 μPa, consistent with the minimum level detectable by humans. For underwater sound, a reference level of 1 μPa is used because this provides a more convenient reference and because a reference based on the threshold of human hearing in air is irrelevant. For this reason, as well as the different propagation properties of air and water, it is not meaningful to compare the levels of sound received in air (measured in dB re 20 μPa) and in water (in dB re 1 μPa) without adding the 26 dB correction factor to the airborne sound levels.

H.4.2 SOURCE CHARACTERISTICS

The most significant range-related sources of underwater noise operating on the VACAPES Range Complex are the ships used in ASW exercises. Because of their slow speed compared to most of the airborne sources considered in the last section, they can be considered to be continuous sound sources. The primary underwater transient sound sources are naval gunfire, aircraft-delivered bombs and gunfire, missile launches, and water surface impacts from missiles and falling debris. All sources are subsonic or stationary in water. While supersonic underwater shock waves are produced at short ranges by underwater explosions, no sources operate at supersonic speeds in water.

H.4.3 UNDERWATER SOUND TRANSMISSION

Airborne sources transmit most of their acoustic energy to the surface by direct paths that attenuate sound energy by spherical divergence (spreading) and molecular absorption. For sound propagating along oblique paths relative to the ground plane, there may also be attenuation (or amplification) by refraction (bending) from sound speed gradients caused by wind and temperature changes with altitude. There may also be multipath transmission caused by convergence of several refracted and reflected sound rays, but this is generally not important for air-to-ground transmission. However, for underwater sound, refracted and multipath transmission is often more important than direct path transmission, particularly for high-power sound sources capable of transmitting sound energy to large distances.

A surface layer sound channel often enhances sound transmission from a surface ship to a shallow receiver in tropical and mid-latitude deep-water areas. This channel is produced when a mixed isothermal surface layer is developed by wave action. An upward refracting sound gradient, produced by the pressure difference within the layer, traps a significant amount of the sound energy within the layer. (Sound travels faster with increasing depth.) This results in cylindrical rather than spherical spreading. This effect is particularly observable at high frequencies where the sound wavelengths are short compared to the layer depth. When the mixed layer is thin or not well defined, the underlying thermocline may extend toward the surface, resulting in downward refraction at all frequencies and a significant increase in transmission loss at shorter ranges where bottom reflected sound energy is normally less than the directly transmitted sound component.

In shallow water areas sound is trapped by reflection between the surface and bottom interfaces. This often results in higher transmission loss than in deep water because of the loss that occurs with each reflection, especially from soft or rough bottom material. However, in areas with a highly reflective bottom, the transmission loss may be less than in deep water areas since cylindrical spreading may occur.

The many interacting variables involved in prediction of underwater transmission loss have led to the development of analytical and computer models. One or more of these models will be used in analyzing the potential impact of the underwater noise sources in the range areas.

H.4.4 UNDERWATER AMBIENT NOISE

Above 500 Hz, deep ocean ambient noise is produced primarily by wind and sea state conditions. Below 500 Hz, the ambient noise levels are strongly related to ship traffic, both near and far. In shallow water near continents and islands, surf noise is also a significant factor. Wenz (1962) and Urick (1983) are among many contributors to the literature on underwater ambient noise. Figure H.6, based on these two sources, was adapted by Malme, *et al*. (1989) to show ambient noise spectra in 1/3-octave bands for a range of sea state and ship traffic conditions.

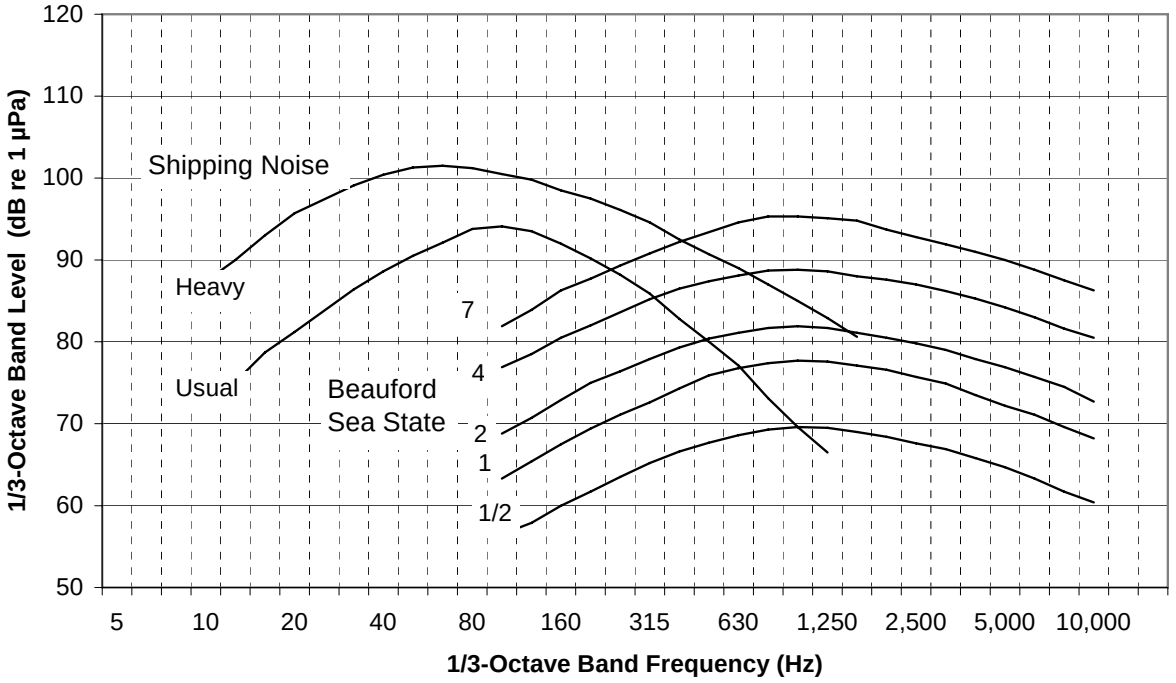


Figure H.6 Underwater Ambient Noise

Wind

On a 1/3-octave basis, wind-related ambient noise in shallow water tends to peak at about 1 kHz (see Figure H.6). Levels in 1/3-octave bands generally decrease at a rate of 3 to 4 dB per octave at progressively higher frequencies, and at about 6 dB per octave at progressively lower frequencies. Sound levels increase at a rate of 5 to 6 dB per doubling of wind speed. At a frequency of about 1 kHz, maximum 1/3-octave band levels are frequently observed at 95 dB referenced to 1 µPa for sustained winds of 34 to 40 knots and at about 82 dB for winds in the 7 to 10-knot range. Wave action and spray are the primary causes of wind-related ambient noise; consequently, the wind-related noise component is strongly dependent on wind duration and fetch as well as water depth, bottom topography, and proximity to topographic features such as islands and shore. A sea state scale, which is related to sea surface conditions as a function of wind conditions, is commonly used in categorizing wind-related ambient noise. The curves for wind-related ambient noise shown in Figure H.6 are reasonable averages, although relatively large departures from these curves can be experienced depending on site location and other factors such as bottom topography and proximity to island or land features.

Surf Noise

Very few data have been published relating specifically to local noise due to surf in nearshore areas along mainland and barrier island coasts. Estimated noise source level densities for heavy surf at Duck, North Carolina, varied from 120 to 125 dB re 1 µPa/Hz$^{1/2}$ /m at 200 Hz to 90-100 dB re 1 µPa/Hz$^{1/2}$ /m at 900 Hz, with a slope of -5 dB per octave (Fabre and Wilson, 1997). These results compare well with previous surf noise studies conducted in Monterey Bay, California by Wilson, *et al*. (1985). Wilson, *et al*. (1985) presents underwater noise levels for wind-driven surf along the exposed Monterey Bay coast, as measured at a variety of distances from the surf zone. Wind conditions varied from 25 to 35 knots. They vary from 110 to 120 dB in the 100 to 1,000 Hz band at a distance of 650 feet from the surf zone, down to levels of 96 to 103 dB in the same band 4.6 nm from the surf zone. Assuming these levels are also representative near shorelines in the VACAPES Range Complex area, surf noise in the 100 to 500 Hz

band will be 15 to 30 dB above that due to wind-related noise in the open ocean under similar wind speed conditions.

Distant Shipping

The presence of a relatively constant low frequency component in ambient noise within the 10 to 200 Hz band has been observed for many years and has been related to distant ship traffic as summarized by Wenz (1962) and Urick (1983). Low frequency energy radiated primarily by cavitating propellers and by engine excitation of the ship hull is propagated efficiently in the deep ocean to distances of 100 nm or more. Higher frequencies do not propagate well to these distances due to acoustic absorption. Also, high frequency sounds radiated by relatively nearby vessels will frequently be masked by local wind-related noise. Thus, distant shipping contributes little or no noise at high frequency. Distant ship-generated low frequency noise incurs more attenuation when it propagates across continental shelf regions and into shallow nearshore areas than occurs in the deep ocean.

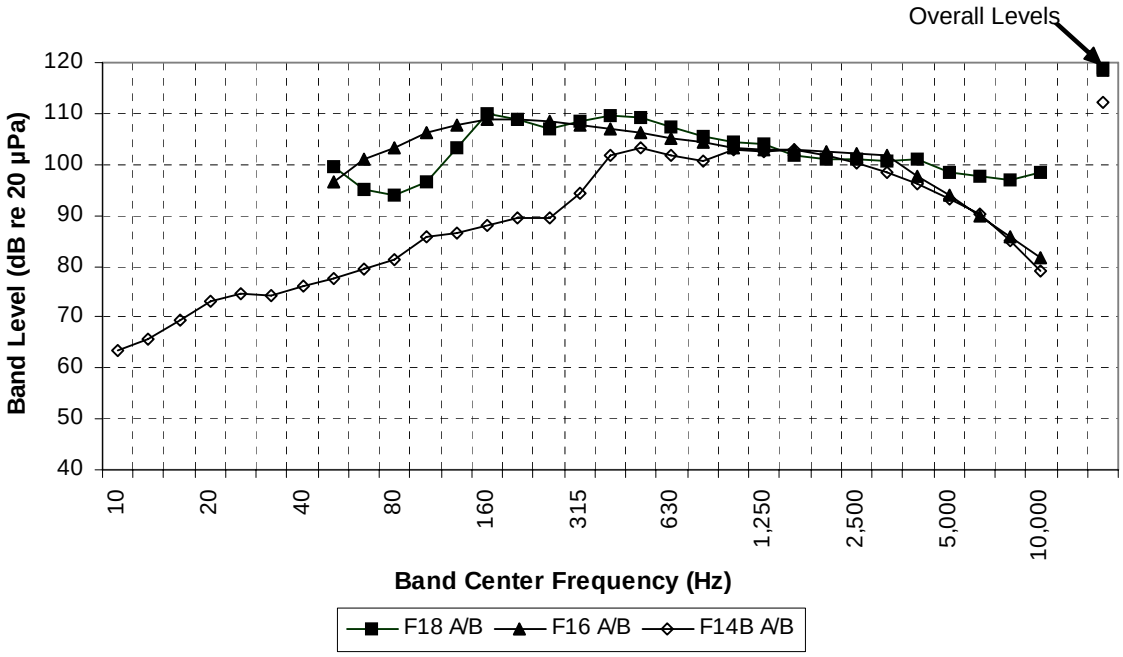
Figure H.6 also provides two curves that approximate the upper bounds of distant ship traffic noise. The upper curve represents noise at sites exposed to heavily used shipping lanes. The lower curve represents moderate or distant shipping noise as measured in shallow water. As shown, highest observed ambient noise levels for these two categories are 102 dB and 94 dB, respectively, in the 60 to 100 Hz frequency range. In shallow water the received noise from distant ship traffic can be as much as 10 dB below the lower curve given in Figure H.6, depending on site location on the continental shelf. In fact, some nearshore areas can be effectively shielded from this low frequency component of shipping noise due to sound propagation loss effects.

Note that the shipping noise curves shown in Figure H.6 show typical received levels attributable to *distant* shipping. Considerably higher levels can be received when a ship is present within a few miles.

H.4.5 MARINE MAMMAL NOISE METRICS

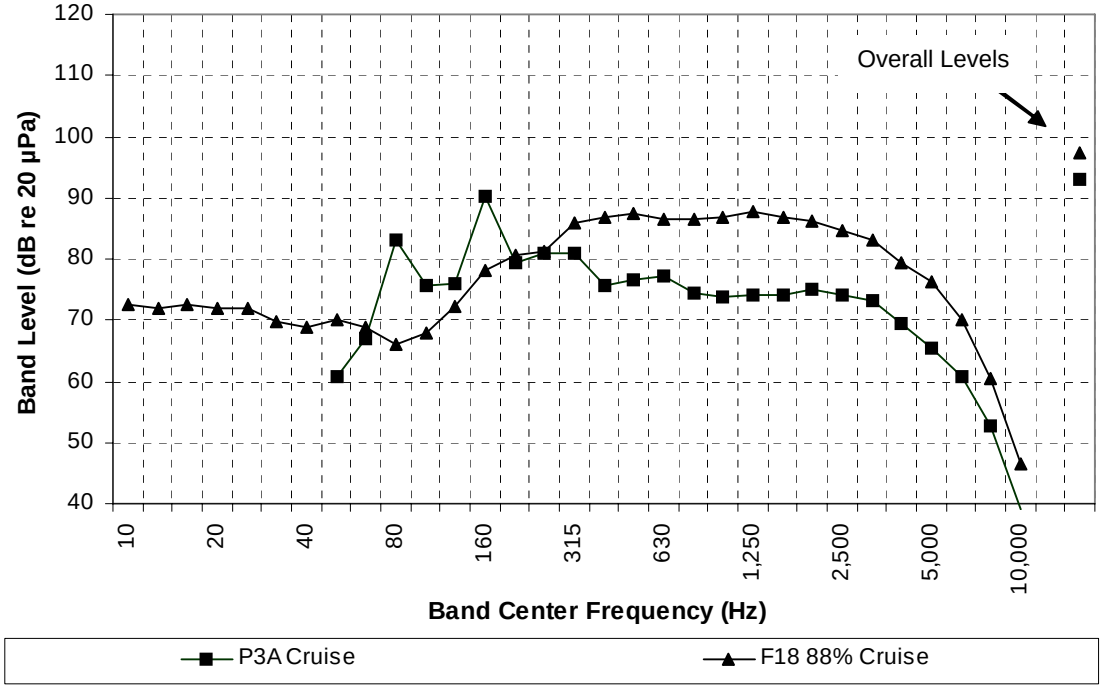
Noise received at and below the sea surface is relevant to marine mammals and some other marine animals at sea. The spectral composition and overall level of each airborne noise source must both be considered in assessing potential impacts on marine mammals present at sea in the VACAPES Range Complex. As described earlier, the most significant sources are low-flying aircraft and their related weapons, naval gunfire, targets, missiles, and debris impacts. Brief noise transients or impulses from surface missile launches, low level explosions, and gunfire may also be important during training operations.

Aircraft spectrum information was obtained from the U.S. Air Force Armstrong Laboratory for various aircraft types (Armstrong Aerospace Medical Research Laboratory, 1990). Data for some additional types of aircraft occasionally used on the VACAPES Range Complex were also included. The information obtained is summarized in the 1/3-octave band spectra shown in Figure H.7A (for fighter and attack aircraft), and Figure H.7B (selected VACAPES Range Complex aircraft). Most of these spectra represent received levels near the surface during overflights at 1,000 feet above sea level under standard atmospheric conditions (59° F, 70 percent relative humidity). The data shown in this standard format can be adjusted for different aircraft altitudes and other atmospheric attenuation conditions – an important consideration at high frequencies.



Source: Air Force Aerospace Medical Research Laboratory, 1990.

Figure H.7A Noise Spectra: Fighter and Attack Aircraft



T/O = takeoff
Source: Air Force Aerospace Medical Research Laboratory, 1990.

Figure H.7B Noise Spectra: Selected VACAPES Range Complex Aircraft

Helicopters of different sizes and types emit intense low frequency engine sounds during flights. Most frequencies are in the range of 20 to 200 Hz, well within the range of hearing of most terrestrial and marine animals. Sound levels associated with the SH-60R are similar to the current H-60 helicopters, since the engines are the same. The SH-60R also uses the same engine as the variant, MH-60S helicopter used in the VACAPES Range Complex, and thus sound levels are representative of VACAPES Range Complex helicopters.

In 1991, the Air ASW Systems Program Office conducted tests to determine the effects of in-water H-60 helicopter noise on ASW operations (DoN, 1999). During these tests, an H-60 flew over calibrated sonobuoys (receiver depth 400 feet) at altitudes ranging from 250 to 5000 feet. Results showed a relatively flat spectrum (increases of approximately 1 to 5 dB over ambient) below 200 Hz rising to a maximum increase of 18 dB between 2 and 3 kHz. Models to determine precise in-water, near-surface noise levels are not reliable for all sea surface conditions. Spherical spreading can be used to estimate near-surface point noise levels. These levels were estimated by adding 42.5 dB (calculated from spherical spreading) to the received levels at 400 feet and by summing the energy across the entire spectrum. Table H.3 provides a summary of the estimated equivalent in-water, near-surface spectrum noise level for an H-60 helicopter operating at 250 feet. When this energy is summed across the entire spectrum, the nominal case estimate is an in-water, near-surface total energy level of 142.2 dB for a helicopter hovering at 250 feet. This level could be higher if the helicopter hovers at a lower altitude.

Table H.3 Estimated H-60 In-Water, Near-Surface Noise Levels

Frequency	**Spectrum Noise Level at 122 m (400 ft) Depth** (dB re 1 μPa)	**Estimated Near-Surface Spectrum Noise Level** (dB re 1 μPa)
10 Hz	80	123
100 Hz	72	115
500 Hz	60	103
1 kHz	56	99
2.5 kHz	45	88
5 kHz	28	71
Source: DoN, 1999.		

The aircraft spectra can be compared to the shapes and quantitative features of marine mammal audiograms, when known, to determine the weighting functions and overall level adjustments needed to estimate the perceived overall levels produced during close encounters. These levels can then be compared to known or assumed impact thresholds to determine whether a detailed analysis is needed. If a detailed analysis is indicated, then contour plots can be calculated to estimate the total number of animals potentially affected by an encounter scenario.

H.4.6 SONIC BOOM PROPAGATION INTO THE WATER

Aircraft Overflights

Supersonic operations in the VACAPES Range Complex result in sonic boom penetration of the water in the operating area. Boom signatures were estimated using PCBOOM3 (Air Force Aerospace Medical Research Laboratory, 1996) to determine the potential for noise impacts near or at the surface. The F-4 fighter is used as an example, although it has since been replaced by the F-14s and later by the F/A-18s. Table H.4 shows the underwater boom parameters at locations near the water surface together with the estimated attenuation rate of peak pressure with depth using a method developed by Sawyers (1968).

Table H.4 Underwater Sonic Boom Parameters for F-4 Overflight

Sonic Boom Parameters			**Depth Peak Pressure Loss (feet)**					
Speed	**Alt. (feet)**	**T (msec)**	**Lp (1μPa)**	**CSEL**	**ASEL**	**6 dB**	**10 dB**	**20 dB**
M1.2	10,000	103	168.0	143.9	129.6	11.5	24.6	68.9
M1.2	5,000	88	179.9	148.8	134.3	9.8	21.3	59.7
M1.2	1,000	64	182.9	159.1	145.6	6.9	15.1	42.6
M2.2	1,000	44	186.7	163.1	149.7	9.7	21.0	58.4

Source: Ogden, 1997.

Missile and Target Overflights

Low-level supersonic target and missile flights also produce significant underwater sonic boom noise. Supersonic targets launched from Wallops Flight Facility into the VACAPES Operating Area (OPAREA) include the Vandal and AQM-37 target drones. Specific data are not available for the Vandal target under normal flight conditions at low altitudes of 100 feet down to 20 feet. The required sonic boom estimates were made using a method developed by Carlson (1978) and adapted for model-based analysis by Lee and Downing (1996). This analysis assumes that the essential boom signature is a simple "N-wave" as is typically measured for supersonic aircraft passing at high altitudes (hundreds of feet). At lower altitude overflights, which are of interest here, the pressure contributions from the shape variations on the aircraft body and wings become observable, and at very low altitudes the signature is no longer a simple N-wave.

The acoustic impact analysis requires estimates of both the peak pressure level produced by a Vandal boom and the total sound energy exposure. The peak pressure level produced at close range (near field) can be influenced by contributions from minor peaks in the waveform. A relevant study by McLean and Shrout (1966) made a comparison of near-field boom waveforms calculated with appropriate near-field theory with waveforms predicted by far-field theory for representative aircraft. The results showed that the peaks predicted by the near-field theory were generally about 10 percent lower than those predicted at the same range by far-field theory. Thus in this application, the use of the Carlson method would be expected to yield conservative results.

The energy density spectrum and total sound energy exposure were estimated using Fourier analysis of the predicted N-wave to obtain the unweighted (flat) energy density spectrum and the F-SEL. This spectrum was then A-weighted to estimate the A-SEL. The A-SEL is about 9 dB below the F-SEL. On the issue of near-field effects, the change in frequency distribution of the pressure signature with distance must be considered. The near field signature has more of its energy in smaller shock waves associated with the details of the airframe (e.g., fins, fuselage changes in area, etc.). The peaks associated with the far-field N signature have not yet fully developed so more of the acoustic energy appears at higher frequencies. A coalescing process is caused by non-linear propagation of high-pressure sound in the atmosphere (sound travels faster at higher pressures) that occurs with distance as the sound wave propagates outward from the flight path. Initially smooth high-pressure fluctuations compress into shock waves. Thus, because of the increased high frequency content, the resulting total energy of a near-field signature measured at 20 feet would likely be reduced less by the A-weighting process than would the total energy of an N-wave approximation. However, this difference is not be expected to be more than 2 to 3 dB because of the large shifts in spectrum energy that would be required during propagation.

An analytic model was developed to predict the boom signature produced by Vandal flights that used the Vandal dimensions and assumed a level flight at Mach 2.1 at various altitudes. For an altitude of 20 feet, the predicted overpressure underwater at the surface is 300 psf or 203 dB re 1 μPa with a boom duration of 4.8 milliseconds. The peak level is estimated to be 10 dB lower at a depth of 1.5 feet and 20 dB lower at a depth of 5 feet, based on an analysis developed by Sawyers (1968).

The sonic boom associated with the AQM-37 was analyzed in the Final Environmental Assessment (EA) for AQM-37 Operations at the National Aeronautics and Space Administration Goddard Space Flight Center Wallops Flight Facility (NASA, 2003). According to the EA, sonic booms would occur with each target launch after the vehicle exceeded the speed of sound. The sonic boom would be directed toward the front of the vehicle. Due to the small size of the AQM-37, the sonic boom would be much less than that of an aircraft flying at a similar velocity and flight path. Sonic booms would not be heard outside of the VACAPES OPAREA.

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APPENDIX I

STATISTICAL PROBABILITY MODELING FOR MUNITIONS IMPACTS

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Statistical Probability Model for Estimating Impact Probability and Number of Exposures

Direct Impact Model (DIM)

A statistical probability model, the Direct Impact Model (DIM), was developed to estimate the impact probability (P) and number of exposures (T) associated with direct impact of falling munitions (ordnance) with marine animals on the sea surface within the given warning area (R) in which naval operations are occurring. The DIM model is based on probability theory and modified Venn diagrams with rectangular "footprint" areas for the individual animal (A) and total impact (I) inscribed inside the warning area (R):

1) A = length*width, where the individual animal's width (breadth) is assumed to be 20% of its length. For a given season, this product for A is multiplied by the number of animals N_a in the warning area (i.e., product of seasonal animal density (D) and warning area (R): $N_a = D*R$) to obtain the total animal footprint area ($A*N_a = A*D*R$) in the given warning area. When integrating over the number of animal species of each type (e.g., all marine mammals, all sea turtles), these calculations are repeated (accounting for differences in dimensions and densities for different species) to obtain the total animal footprint area for each species. These animal footprint areas are summed over all species of interest to obtain the total animal footprint area resulting from all animals present in the given warning area in the given season.

2) $I = N_{mun}*length*diameter$, where N_{mun} = number of munitions, and "length" and "diameter" refer to the individual munitions dimensions. For a given season and warning area, the total number of munitions for each munitions type is multiplied by the percent use by warning area and the percent use by season to obtain the "effective" number of munitions (N_{mun}). For each munitions type, the individual impact footprint area is multiplied by the "effective" number of munitions to obtain the type-specific impact footprint area ($I = N_{mun}*length*diameter$). Each naval operation uses one or more different types of munitions, each with a specific number of munitions (e.g., gunnery, missiles, bombs) and dimensions, and several operations can occur in a given season and warning area. When integrating over the number of munitions types for the given operation (and then over the number of operations in the given season and warning area), these calculations are repeated (accounting for differences in dimensions and numbers for different munitions types and different operations) for all munitions types used, to obtain the type-specific impact footprint area (I) for each munitions type. These impact footprint areas are summed over all munitions types for the given operation, and then summed (integrated) over all operations to obtain the total impact footprint area resulting from all operations occurring in the given warning area in the given season.

The probability (P) that a random point (i.e., a falling munitions) within R is within the animal footprint (A) or within the impact footprint (I), is calculated as the area ratio A/R or I/R, respectively. [Note that A (referring to an INDIVIDUAL animal footprint) and I (referring to the impact footprint resulting from the TOTAL number of munitions N_{mun}) are the relevant quantities used in the following calculations of single-animal impact probability (P), which is then multiplied by the number of animals to obtain the number

of exposures T.] The probability that the random point on the warning area is within both types of footprints (i.e., A and I) depends on the degree of overlap of A and I. The probability that I overlaps A is calculated by adding a buffer distance around A based on one-half of the impact area (i.e., 0.5*I), such that an impact (center) occurring anywhere within the combined (overlapping) area would impact the animal. Thus, if L_i and W_i are the length and width of the impact footprint such that $L_i*W_i = 0.5*I$ and $W_i/L_i = L_a/W_a$ (i.e., similar geometry between the animal footprint and impact footprint), and if L_a and W_a are the length and width (breadth) of the individual animal such that $L_a*W_a = A$ (= individual animal footprint area), then, assuming a purely static, rectangular model (Model 1), the total area $A_{tot} = (L_a + 2*L_i)*(W_a + 2*W_i)$, and the buffer area $A_{buffer} = A_{tot} – L_a*W_a$.

Four models were examined with respect to defining and setting up the overlapping combined areas of A and I:
1) **Model 1**: Purely static, rectangular model. Impact is assumed to be static (i.e., direct impact effects only; non-dynamic; no explosions or scattering of shrapnel after the initial impact). Hence the impact footprint area (I) is assumed to be rectangular and given by the product of ordnance length and ordnance width (multiplied by the number of ordnances). $A_{tot} = (L_a + 2*L_i)*(W_a + 2*W_i)$ and $A_{buffer} = A_{tot} – L_a*W_a$.
2) **Model 2**: Dynamic model with end-on collision, in which the length of the impact footprint (L_i) is enhanced by R_n = 4-5 ordnance lengths to reflect forward momentum. $A_{tot} = (L_a + (1+R_n)*L_i)*(W_a + 2*W_i)$ and $A_{buffer} = A_{tot} – L_a*W_a$.
3) **Model 3**: Dynamic model with broadside collision, in which the width of the impact footprint (W_i) is enhanced by Rn = 4-5 ordnance lengths to reflect forward momentum. $A_{tot} = (L_a + 2*W_i)*(W_a + (1+R_n)*L_i)$ and $A_{buffer} = A_{tot} – L_a*W_a$.
4) **Model 4**: Purely static, radial model, in which the rectangular animal and impact footprints are replaced with circular footprints while conserving area. Define the radius (R_a) of the circular individual animal footprint such that $pi*R_a^2 = L_a*W_a$, and define the radius (R_i) of the circular impact footprint such that $pi*R_i^2 = 0.5*L_i*W_i = 0.5*I$. Then $A_{tot} = pi*(R_a + R_i)^2$ and $A_{buffer} = A_{tot} – pi*R_a^2$ (where pi = 3.1415927).

Static impacts (Models 1 and 4) assume no additional aerial coverage effects of scattered ordnance beyond the initial impact. For dynamic impacts (Models 2 and 3), the distance of any scattered ordnance (e.g., shrapnel) must be considered, by increasing the length (Model 2) or width (Model 3), depending on orientation (broadside versus end-on collision), of the impact footprint to account for the forward horizontal momentum of the falling ordnance. Forward momentum typically accounts for 4-5 ordnance lengths, resulting in a corresponding increase in impact area. Significantly different values may result from these 2 types of orientation. Both of these types of collision conditions can be calculated each with 50% likelihood (i.e., equal weighting between Models 2 and 3, in order to average these potentially different values.

Impact probability P is the probability of impacting one animal with the given number, type, and dimensions of all munitions/ordnance used in all naval operations occurring in the given warning area and season, and is given by the ratio of total area (A_{tot}) to warning area area (R): $P = A_{tot}/R$. Number of exposures is $T = N*P = N*A_{tot}/R$, where N =

number of animals in the Range Complex area in the given season (given as the product of seasonal animal density D and Range Complex area R). Thus, N = D*R and hence T = N*P = N*A_{tot}/R = D*A_{tot}. Using this procedure, P and T were calculated for each of the 4 models, for each animal species, for each season (and annually), for each munitions type used in all of the naval operations in the given warning area. The model-specific P and T values were averaged over the 4 models (using equal weighting) to obtain model-averages. Annual estimates of P and T were obtained by integrating the 4 seasonal estimates. Furthermore, the following integrated impact probabilities were calculated:

1) **Munitions-integrated**: Impact footprint areas were calculated for each individual munitions type and number. These footprint areas were summed to include all munitions used in all naval operations in the given season and annually in the given warning area. This enhanced impact footprint area was used together with the species-specific animal footprint area to calculate the munitions-integrated impact probability P and number of exposures T.

2) **Species-integrated**: Animal footprint areas were calculated for each individual animal species and associated density. These animal densities and footprint areas were summed to include all animal species of interest occurring in the given season and annually in the given warning area. These enhanced animal densities and animal footprint areas were used together with the munitions-specific impact footprint area to calculate the species-integrated impact probability P and number of exposures T. Species integrations were conducted over all species and also over only those species in the following categories: a) All marine mammals only; b) All sea turtles only.

3) **Species-and-munitions-integrated**: Both the enhanced impact footprint area and the enhanced animal footprint area were used to calculate this double-integrated impact probability P and number of exposures T.

Parameters for Model Application

Impact probabilities P and number of exposures T were estimated by the DIM model for the following parameters:

1) **Three proposed action plans**: No Action Alternative, Alternative 1, and Alternative 2. Number of events (munitions) for each naval operation in each warning area for the 2 alternatives is proportional to that of the Baseline action plan (based on a proportionality factor, the ratio of total number of events between the given alternative plan and the Baseline plan) across all types of munitions, all 4 seasons, all animal species, all naval operations, and all warning areas of the given OPAREA involved in the given naval operation. Animal densities and dimensions, munitions dimensions, and percent use distributions of munitions across the warning area and seasons are the same for the 3 action plans.

2) **Three OPAREAS**: Virginia Capes (VACAPES), Jacksonville (JAX), and Navy Cherry Point (CHPT): Areas are 27661, 50090, and 18617 square nautical miles (nm^2), respectively. Only VACAPES OPAREA is included in the tables below.

3) **All restricted and warning areas** within the given study area for which marine animal densities and naval operations data are available: a) **VACAPES**: R-6606, W-386,

W-50, and W-72; 2) **JAX**: W-157, W-158, W-159, W-132, W-133, W-134, and R2910A/B/C; 3) **CHPT**: W-122. Percent use distributions of munitions for each naval operation across the involved study areas were used in the model calculations.
4) **Three types of munitions**: a) **Gunnery**: 40-mm grenade; 0.50 cal projectile; 7.62-mm projectile; 20-mm and 25-mm projectile cannon shells; 5", 20-mm CIWS, 25-mm, and 76-mm naval gun projectiles; b) **Bombs**: BDU-45; BDU-48; MK-20; MK-76; MK-82I; MK-82L; MK-83I; MK-83L; MK-84L; LGTR; CATM; AGM-65; GBU-12I; GBU-12L; GBU-16I; c) **Missiles**: AGM-114 (Hellfire); RIM-7; SM-1; AGM-88 (HARM); AIM-7; AIM-9; AIM-54; AIM-120.
6) **All animal species** of interest and report type (EIS, LOA): Marine mammals and sea turtles, including threatened and endangered species.
7) **Four seasons** (Winter, Spring, Summer, Fall) and annually. Seasonal percent use distributions of munitions for each naval operation were used in the seasonal model calculations.

Model Input Data
In addition to the identity and areas of each study area, input data for the DIM model include animal species and munitions used in each naval operation in each warning area. Animal species data include: 1) Species ID and status (i.e., threatened, endangered, or neither); 2) Seasonal animal density estimates for each species and each warning area; 3) Adult animal dimensions (length and width/breadth) for each species. The animal dimensions are used to calculate individual animal footprint areas (A = length*width), and animal densities are used to calculate the number of exposures (T) from the impact probability (P): T = N*P. Munitions data include: 1) Munitions ID and category (e.g., gunnery, bomb, missile); 2) Munitions dimensions (length, width/diameter); 3) Total number of munitions used in each naval operation (e.g., number of bullets, missiles, or bombs); 4) Percent use of the total number of munitions in the given restricted/warning area occurring in the given study area; 5) Distribution of percent use of munitions by season.

Munitions input data, specifically the ordnance quantity (e.g., numbers of guns, bombs, and missiles), are different in magnitude among the 3 proposed action plans (Baseline, Alternative 1, and Alternative 2) but vary proportionally across all types of munitions, across all warning area involved in the given naval operation, and across all 4 seasons. From the munitions quantities (for the given munitions type, naval operation, warning area, and season) for the Baseline plan, the corresponding quantities for the Alternative 1 and Alternative 2 plans are calculated by multiplying by a proportionality factor, given by the ratio of the total number of events (munitions) for the given Alternative (1 or 2) to the total number of events (munitions) for the Baseline. All animal species input data, the munitions ID and category, munitions dimensions, and the percent use distributions across all involved warning area and across the 4 seasons are the same for the 3 action plans. Only the magnitude of munitions quantities (i.e., total number of munitions) are different and vary proportionally according to the constant proportionality factor.

Model Output Data

Generating seasonal estimates of impact probability (P) and number of exposures (T) for each season and species of interest, the DIM model was run for each study area (accounting for all naval operations and their specific munitions numbers and percent use distributions across restricted/warning areas and seasons) of each warning area, for each of the 3 action plans. The model calculates P and T from falling munitions associated with all naval operations occurring in the given restricted/warning area of the given study area, for the given action plan. These P and T estimates were calculated for all 4 seasons for all animal species of interest and were categorized according to species, season, study area, restricted/warning area, report, and action plan. Probabilities and exposure estimates were also integrated over all restricted/warning areas within the given study area, over all species of a given animal type (i.e., all animal species, all marine mammals, all sea turtles), and over all 4 seasons (to obtain annual estimates). Seasonal variabilities in P and T arise from seasonal variabilities in animal densities and in percent use distributions of munitions for the naval operations occurring in the given restricted/warning area. Differences in P and T among study areas arise from geographical differences in animal densities and differences in percent use distributions of munitions among all restricted/warning areas involved in the given naval operations. Differences in P and T among action plans for the given study area arise from different numbers of events (munitions) for the two alternative action plans relative to the Baseline action plan.

Species- and munitions-integrated P and T values are summarized in final output form for each action plan, report, restricted/warning area, study area, season and annually, and type of species integrated (i.e., all species, all marine mammals, all sea turtles). Typical impact probabilities (P) range on the order of 10^{-5} to 10^{-7}.

Exposure estimates could not be calculated for several species (West Indian manatee, blue whale, sei whale, Bryde's whale, killer whale, pygmy killer whale, false killer whale, melon-headed whale, spinner dolphin, Fraser's dolphin, Atlantic white-sided dolphin, harbor porpoise, and seal species) because density data are limited for these species. However, the likelihood of exposure should be even lower than that estimated for other species with given densities since they are less likely to occur in the Study Area.

The results of the modeling are presented in the following tables. Tables I-1 through I-14 report results under the No Action Alternative; Tables I-15 through I-28 report results under Alternative 1; and Tables I-29 through I-42 report results under Alternative 2.

Direct Munitions Strike- No Action Alternative

Table I-1
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in R-6606 for the VACAPES Range Complex. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	N/A	N/A	N/A	N/A
Humpback Whale	N/A	N/A	N/A	N/A
Fin Whale	N/A	N/A	N/A	N/A
Sperm Whale	N/A	N/A	N/A	N/A
Atlantic Spotted Dolphin	N/A	N/A	N/A	N/A
Atlantic White-Sided Dolphin	N/A	N/A	N/A	N/A
Beaked Whale	N/A	N/A	N/A	N/A
Bottlenose Dolphin	0.00012	<0.0001	<0.0001	<0.0001
Clymene Dolphin	N/A	N/A	N/A	N/A
Common Dolphin	N/A	N/A	N/A	N/A
Minke Whale	N/A	N/A	N/A	N/A
Pantropical Spotted Dolphin	N/A	N/A	N/A	N/A
Pilot Whale	N/A	N/A	N/A	N/A
Rissos Dolphin	N/A	N/A	N/A	N/A
Rough-Toothed Dolphin	N/A	N/A	N/A	N/A
Striped Dolphin	N/A	N/A	N/A	N/A
Kogia spp.	N/A	N/A	N/A	N/A
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles.

Table I-2
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-50C in the VACAPES Range Complex for the No Action Alternative. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	0.00000	0.00000	0.00000	0.00000
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-3
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-72 in the VACAPES Range Complex for the No Action Alternative. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	0.00000	0.00000	0.00000	0.00000
Common Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-4
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-72A in the VACAPES Range Complex for the No Action Alternative. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	0.00028	0.00028	0.00028	0.00028
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	0.00040	0.00040	0.00041	0.00040
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00035	0.00035	0.00035	0.00035
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	0.00011	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	0.00010	0.00010	<0.0001	0.00010
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-5
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-72B in the VACAPES Range Complex for the No Action Alternative. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	0.00000	0.00000	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	0.00011	0.00011	0.00011	0.00011
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	0.00000	0.00000	0.00000	0.00000
Loggerhead Turtle	0.00000	0.00000	0.00000	0.00000
Hardshell Turtle[2]	0.00000	0.00000	0.00000	0.00000
Kemps Ridley Turtle	0.00000	0.00000	0.00000	0.00000

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-6
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-386 in the VACAPES Range Complex for the No Action Alternative. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00049	0.00049	0.00049	0.00049
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00037	0.00037	0.00037	0.00037
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	0.00014	0.00014	0.00017	0.00014
Hardshell Turtle[2]	<0.0001	<0.0001	0.00014	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-7
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in Air-1A in the VACAPES Range Complex for the No Action Alternative. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-8
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in Air-E,F,I,J in the VACAPES Range Complex for the No Action Alternative. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-9
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in Air-K in the VACAPES Range Complex for the No Action Alternative. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00011	0.00011	0.00011	0.00011
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-10
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in Air-3B in the VACAPES Range Complex for the No Action Alternative. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-11
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in 1C1/2 in the VACAPES Range Complex for the No Action Alternative. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-12
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in 5C/D in the VACAPES Range Complex for the No Action Alternative. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-13
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in 7C/D in the VACAPES Range Complex for the No Action Alternative. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Table I-14
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in 8C/D in the VACAPES Range Complex for the No Action Alternative. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all other identified hardshell turtles

Direct Munitions Strike-Alternative 1

Table I-15
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in R-6606 in the VACAPES Range Complex for Alternative 1. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	N/A	N/A	N/A	N/A
Humpback Whale	N/A	N/A	N/A	N/A
Fin Whale	N/A	N/A	N/A	N/A
Sperm Whale	N/A	N/A	N/A	N/A
Shortnose Sturgeon	N/A	N/A	N/A	N/A
Atlantic Spotted Dolphin	N/A	N/A	N/A	N/A
Beaked Whale	N/A	N/A	N/A	N/A
Bottlenose Dolphin	0.00013	<0.0001	<0.0001	<0.0001
Clymene Dolphin	N/A	N/A	N/A	N/A
Common Dolphin	N/A	N/A	N/A	N/A
Minke Whale	N/A	N/A	N/A	N/A
Pantropical Spotted Dolphin	N/A	N/A	N/A	N/A
Pilot Whale	N/A	N/A	N/A	N/A
Rissos Dolphin	N/A	N/A	N/A	N/A
Rough-Toothed Dolphin	N/A	N/A	N/A	N/A
Striped Dolphin	N/A	N/A	N/A	N/A
Kogia spp.	N/A	N/A	N/A	N/A
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-16
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-50C in the VACAPES Range Complex for Alternative 1. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	0.00000	0.00000	0.00000	0.00000
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-17
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-72 in the VACAPES Range Complex for Alternative 1. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	0.00000	0.00000	0.00000	0.00000
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-18
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-72A in the VACAPES Range Complex for Alternative 1. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	0.00033	0.00033	0.00033	0.00033
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	0.00048	0.00048	0.00048	0.00048
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00041	0.00041	0.00041	0.00041
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	0.00011	0.00011	0.00013	0.00011
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	0.00012	0.00012	0.00012	0.00012
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-19
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-72B in the VACAPES Range Complex for Alternative 1. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	0.00000	0.00000	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	0.00012	0.00012	0.00012	0.00012
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	0.00000	0.00000	0.00000	0.00000
Loggerhead Turtle	0.00000	0.00000	0.00000	0.00000
Hardshell Turtle[2]	0.00000	0.00000	0.00000	0.00000
Kemps Ridley Turtle	0.00000	0.00000	0.00000	0.00000

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-20
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-386 in the VACAPES Range Complex for Alternative 1. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00058	0.00058	0.00058	0.00058
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00044	0.00044	0.00044	0.00044
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	0.00016	0.00016	0.00020	0.00016
Hardshell Turtle[2]	0.00011	0.00011	0.00016	0.00011
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-21
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in Air-1A in the VACAPES Range Complex for Alternative 1. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	0.00013	0.00013	0.00013	0.00013
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles

Table I-22
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in Air-E,F,I,J in the VACAPES Range Complex for Alternative 1. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Risso's Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles

Table I-23
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in Air-K in the VACAPES Range Complex for Alternative 1. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00016	0.00016	0.00016	0.00016
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Risso's Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00012	0.00012	0.00012	0.00012
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-24
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in Air-3B in the VACAPES Range Complex for Alternative 1. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-25
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in 1C1/2 in the VACAPES Range Complex for Alternative 1. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-26
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in 5C/D in the VACAPES Range Complex for Alternative 1. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-27
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in 7C/D in the VACAPES Range Complex for Alternative 1. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-28
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in 8C/D in the VACAPES Range Complex for Alternative 1. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Direct Munitions Strike-Alternative 2

Table I-29
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in R-6606 in the VACAPES Range Complex for Alternative 2. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	N/A	N/A	N/A	N/A
Humpback Whale	N/A	N/A	N/A	N/A
Fin Whale	N/A	N/A	N/A	N/A
Sperm Whale	N/A	N/A	N/A	N/A
Atlantic Spotted Dolphin	N/A	N/A	N/A	N/A
Beaked Whale	N/A	N/A	N/A	N/A
Bottlenose Dolphin	0.00013	<0.0001	<0.0001	<0.0001
Clymene Dolphin	N/A	N/A	N/A	N/A
Common Dolphin	N/A	N/A	N/A	N/A
Minke Whale	N/A	N/A	N/A	N/A
Pantropical Spotted Dolphin	N/A	N/A	N/A	N/A
Pilot Whale	N/A	N/A	N/A	N/A
Rissos Dolphin	N/A	N/A	N/A	N/A
Rough-Toothed Dolphin	N/A	N/A	N/A	N/A
Striped Dolphin	N/A	N/A	N/A	N/A
Kogia spp.	N/A	N/A	N/A	N/A
Leatherback Turtle	N/A	N/A	N/A	N/A
Loggerhead Turtle	N/A	N/A	N/A	N/A
Hardshell Turtle[2]	N/A	N/A	N/A	N/A
Kemps Ridley Turtle	N/A	N/A	N/A	N/A

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-30
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-50C in the VACAPES Range Complex for Alternative 2. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	0.00000	0.00000	0.00000	0.00000
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-31
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-72 in the VACAPES Range Complex for Alternative 2. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	0.00000	0.00000	0.00000	0.00000
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	0.00000	0.00000	0.00000	0.00000
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-32
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-72A in the VACAPES Range Complex for Alternative 2. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	0.00034	0.00034	0.00034	0.00034
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	0.00049	0.00049	0.00049	0.00049
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00042	0.00042	0.00042	0.00042
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	0.00011	0.00011	0.00013	0.00011
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	0.00013	0.00013	0.00012	0.00013
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-33
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-72B in the VACAPES Range Complex for Alternative 2. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	0.00000	0.00000	0.00000	0.00000
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	0.00015	0.00015	0.00015	0.00015
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	0.00000	0.00000	0.00000	0.00000
Loggerhead Turtle	0.00000	0.00000	0.00000	0.00000
Hardshell Turtle[2]	0.00000	0.00000	0.00000	0.00000
Kemps Ridley Turtle	0.00000	0.00000	0.00000	0.00000

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-34
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in W-386 in the VACAPES Range Complex for Alternative 2. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00055	0.00055	0.00055	0.00055
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	0.00041	0.00041	0.00041	0.00041
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	0.00015	0.00015	0.00019	0.00015
Hardshell Turtle[2]	0.00011	0.00011	0.00015	0.00011
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-35
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in Air-1A in the VACAPES Range Complex for Alternative 2. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	0.00013	0.00013	0.00013	0.00013
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-36
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in Air-E,F,I,J in the VACAPES Range Complex for Alternative 2. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-37
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in Air-K in the VACAPES Range Complex for Alternative 2. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	0.00012	0.00012	0.00012	0.00012
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-38
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in Air-3B in the VACAPES Range Complex for Alternative 2. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-39
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in 1C1/2 in the VACAPES Range Complex for Alternative 2. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-40
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in 5C/D in the VACAPES Range Complex for Alternative 2. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-41
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in 7C/D in the VACAPES Range Complex for Alternative 2. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

Table I-42
Seasonal[1] exposure estimates from impacts/collisions of falling munitions/ordnance with marine animals in 8C/D in the VACAPES Range Complex for Alternative 2. N/A = No exposure estimate available.

SPECIES	WINTER	SPRING	SUMMER	FALL
North Atlantic Right Whale	<0.0001	<0.0001	0.00000	<0.0001
Humpback Whale	<0.0001	<0.0001	0.00000	<0.0001
Fin Whale	<0.0001	<0.0001	<0.0001	<0.0001
Sperm Whale	<0.0001	<0.0001	<0.0001	<0.0001
Atlantic Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Beaked Whale	<0.0001	<0.0001	<0.0001	<0.0001
Bottlenose Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Clymene Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Common Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Minke Whale	<0.0001	<0.0001	<0.0001	<0.0001
Pantropical Spotted Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Pilot Whale	<0.0001	<0.0001	<0.0001	<0.0001
Rissos Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Rough-Toothed Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Striped Dolphin	<0.0001	<0.0001	<0.0001	<0.0001
Kogia spp.	<0.0001	<0.0001	<0.0001	<0.0001
Leatherback Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Loggerhead Turtle	<0.0001	<0.0001	<0.0001	<0.0001
Hardshell Turtle[2]	<0.0001	<0.0001	<0.0001	<0.0001
Kemps Ridley Turtle	<0.0001	<0.0001	<0.0001	<0.0001

[1]Winter (December, January, February); Spring (March, April, May); Summer (June, July, August); and Fall (September, October, November)
[2]Hardshell Turtles consist of greens, hawksbills, and all unidentified hardshell turtles.

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APPENDIX J

TECHNICAL RISK ASSESSMENT FOR THE USE OF UNDERWATER EXPLOSIVES

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CHAPTER 1 INTRODUCTION

This appendix provides the background information, assumptions, and the details of the impact assessment for use of underwater explosives in conjunction with the training outlined in Chapter 2 of this EIS/OEIS. It specifically addresses the potential impact to marine mammals and sea turtles from underwater explosives used in the Firing Exercises (FIREX) with the Integrated Maritime Portable Acoustic Scoring & Simulator (IMPASS) system, Bombing Exercises (BOMBEX), Mine Neutralization Exercises (MINEX), and Missile Exercises (MISSILEX) in the Virginia Capes (VACAPES) Range Complex. Assumptions that were made for the analysis include:

- Exposures were rounded to the nearest whole number using conventional rounding methods (<0.5 was rounded down and ≥0.5 was rounded up).
- Unless otherwise indicated, annual event totals were divided evenly across the four seasons as we assume these events can occur at anytime during the year.
- For events that could occur in any one of multiple sub-areas (ex. FIREX), the number of events was evenly distributed over each of the sub-areas.
- In the absence of specifically developed criteria for sea turtles, the criteria developed for marine mammals is used in this analysis to determine potential exposures for sea turtles.

Figure J-1 shows each of the areas where explosive ordnance is used in the Virginia Capes (VACAPES) Range Complex under the No Action and Alternative 1. **Figure J-2** shows each of the areas where explosive ordnance is used in the Virginia Capes (VACAPES) Range Complex under Alternative 2.

Table J1-1 summarizes the number of events (per year by season) for the No Action Alternative and specific areas where each occurs for each type of explosive ordnance used. **Table J1-2** summarizes the number of events (per year by season) for Alternative 1 and specific areas where each occurs for each type of explosive ordnance used. **Table J1-3** summarizes the number of events (per year by season) for Alternative 2 and specific areas where each occurs for each type of explosive ordnance used. For most of the operations, there is no difference in how many events take place between the different seasons. Fractional values are a result of evenly distributing the annual totals over the 4 seasons. For example, in Alternative 2 there are 45 Hellfire events per year that can take place in Air Kilo during any season, so there are 11.25 events modeled for each season. However, the 20 lb charge MINEX events are more likely to take place in the summer and this is represented in the seasonal allocation of events.

1.1 Thresholds and Criteria for Impulsive Sound

Criteria and thresholds for estimating the exposures from a single explosive activity on marine mammals were established for the Seawolf Submarine Shock Test Final Environmental Impact Statement (FEIS) ("Seawolf") and subsequently used in the USS Winston S. Churchill (DDG-81) Ship Shock FEIS ("Churchill") (DoN, 1998 and 2001). NMFS adopted these criteria and thresholds in its final rule on unintentional taking of marine animals occurring incidental to the shock testing (NMFS, 2001). Since the ship-shock events involve only one large explosive at a time, additional assumptions were made to extend the approach to cover multiple explosions for FIREX with IMPASS and BOMBEX. In addition, this section reflects a revised acoustic criterion for small underwater explosions (< 1500 NEW) (i.e., 23 pounds per square inch [psi] instead of previous acoustic criteria of 12 psi for peak pressure over all exposures), which is based on an incidental harassment authorization (IHA) issued to the Air Force (NOAA, 2006). As was the case for Seawolf and Churchill, in the absence of specifically developed criteria, criteria and thresholds for impact on protected marine mammals are used for protected sea turtles. **Figure J-3** depicts the acoustic impact framework used in this assessment.

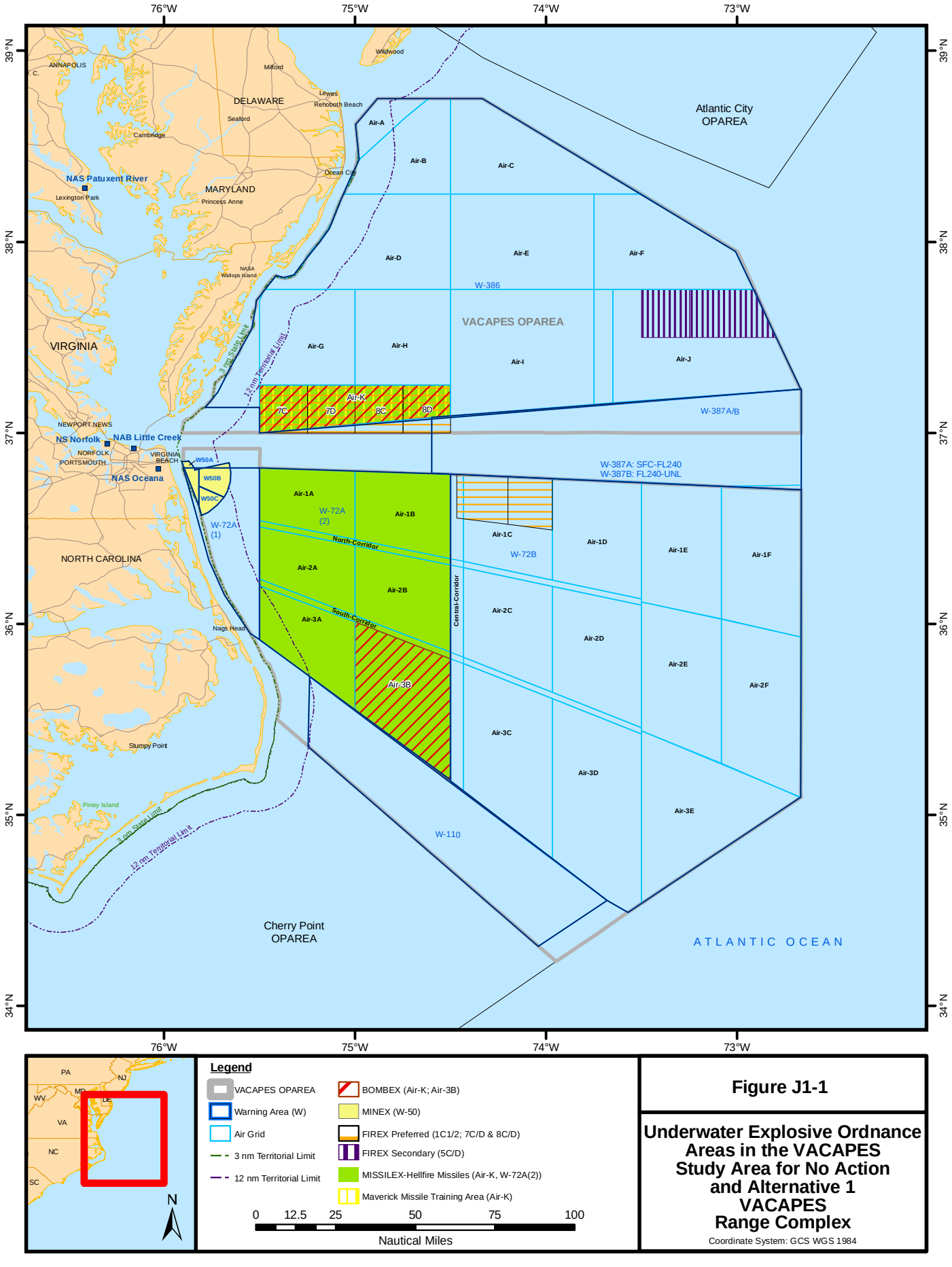


Figure J1-1

Underwater Explosive Ordnance Areas in the VACAPES Study Area for No Action and Alternative 1 VACAPES Range Complex

Coordinate System: GCS WGS 1984

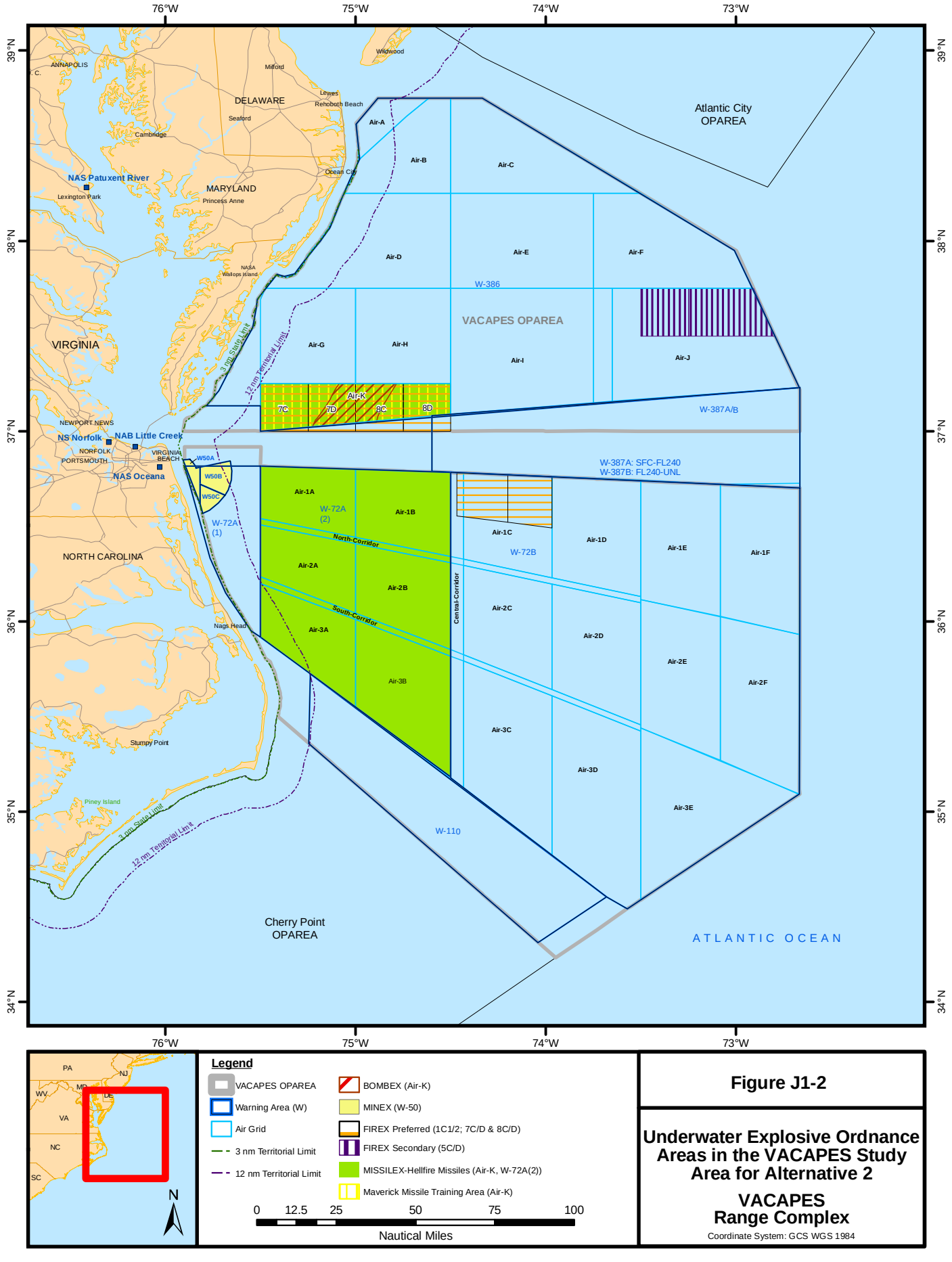


Figure J1-2

Underwater Explosive Ordnance Areas in the VACAPES Study Area for Alternative 2

VACAPES Range Complex

Coordinate System: GCS WGS 1984

TABLE J1-1
NUMBER OF EXPLOSIVE EVENTS WITHIN THE VACAPES RANGE COMPLEX FOR NO ACTION ALTERNATIVE

Sub-Area	Ordnance	Winter	Spring	Summer	Fall	Annual Totals
	MISSILEX					**76**
Air-K	Hellfire	5.625	5.625	5.625	5.625	
W-72A (2)	Hellfire	1.875	1.875	1.875	1.875	
Air-E, F, I, J	Harm	6.50	6.50	6.50	6.50	
Air-K	Maverick	5	5	5	5	
	FIREX					**22**
5C/D	5" rounds	1.83	1.83	1.83	1.83	
7C/D and 8C/D	5" rounds	1.83	1.83	1.83	1.83	
1C1/2	5" rounds	1.83	1.83	1.83	1.83	
	MINEX					**12**
W-50 UNDET	20 LB	2	2	6	2	
	BOMBEX					**132**
Air-K	MK-82*	14.5	14.5	14.5	14.5	
Air-K	MK-83*	5.75	5.75	5.75	5.75	
Air-K	MK-84	2	2	2	2	
Air-K	MK-20	3	3	3	3	
Area 3B	MK-82*	5	5	5	5	
Area 3B	MK-83*	2.5	2.5	2.5	2.5	
Area 3B	MK-84	0.25	0.25	0.25	0.25	

* One event using the MK-82 or MK-83 bombs consists of 4 bombs being dropped in succession. For example, in VACAPES Air-K there are 23 MK-83 events, which mean that a total of 92 bombs will be dropped per year.

TABLE J1-2
NUMBER OF EXPLOSIVE EVENTS WITHIN THE VACAPES RANGE COMPLEX FOR ALTERNATIVE 1

Sub-Area	Ordnance	Winter	Spring	Summer	Fall	Annual Totals
	MISSILEX					**106**
Air-K	Hellfire	11.25	11.25	11.25	11.25	
W-72A (2)	Hellfire	3.75	3.75	3.75	3.75	
Air-E, F, I, J	Harm	6.50	6.50	6.50	6.50	
Air-K	Maverick	5	5	5	5	
	FIREX					**22**
5C/D	5" rounds	1.83	1.83	1.83	1.83	
7C/D and 8C/D	5" rounds	1.83	1.83	1.83	1.83	
1C1/2	5" rounds	1.83	1.83	1.83	1.83	
	MINEX					**54**
W-50 UNDET	5 LB*	7.50	7.50	7.50	7.50	
W-50 UNDET	20 LB	4.00	4.00	12.00	4.00	

TABLE J1-2
NUMBER OF EXPLOSIVE EVENTS WITHIN THE VACAPES RANGE COMPLEX FOR ALTERNATIVE 1 (Continued)

Sub-Area	Ordnance	Winter	Spring	Summer	Fall	Annual Totals
	BOMBEX					**132**
Air-K	MK-82**	14.5	14.5	14.5	14.5	
Air-K	MK-83**	5.75	5.75	5.75	5.75	
Air-K	MK-84	2	2	2	2	
Air-K	MK-20	3	3	3	3	
Area 3B	MK-82**	5	5	5	5	
Area 3B	MK-83**	2.5	2.5	2.5	2.5	
Area 3B	MK-84	0.25	0.25	0.25	0.25	

**The use of 3.24 lb charges during AMNS training were conservatively modeled as 5 lb charges.*

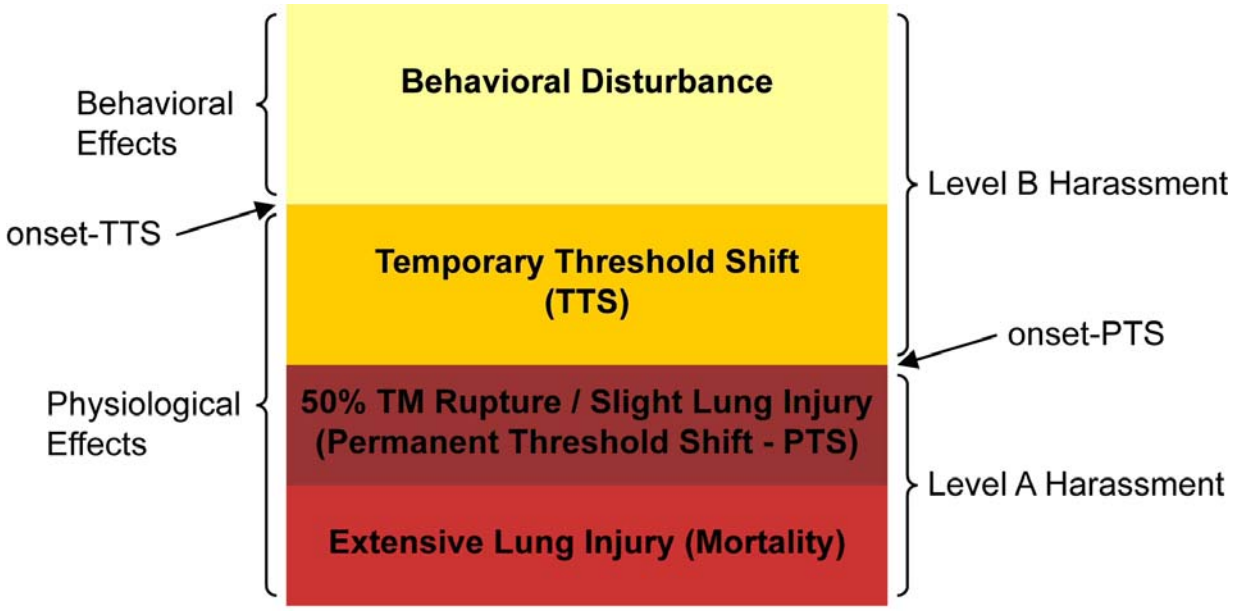
*** One event using the MK-82 or MK-83 bombs consists of 4 bombs being dropped in succession. For example, in VACAPES Air-K there are 23 MK-83 events, which mean that a total of 92 bombs will be dropped per year.*

TABLE J1-3
NUMBER OF EXPLOSIVE EVENTS WITHIN THE VACAPES RANGE COMPLEX FOR ALTERNATIVE 2

Sub-Area	Ordnance	Winter	Spring	Summer	Fall	Annual Totals
	MISSILEX					**106**
Air-K	Hellfire	11.25	11.25	11.25	11.25	
W-72A (2)	Hellfire	3.75	3.75	3.75	3.75	
Air-E, F, I, J	Harm	6.50	6.50	6.50	6.50	
Air-K	Maverick	5	5	5	5	
	FIREX					**22**
5C/D	5" rounds	1.83	1.83	1.83	1.83	
7C/D and 8C/D	5" rounds	1.83	1.83	1.83	1.83	
1C1/2	5" rounds	1.83	1.83	1.83	1.83	
	MINEX					**54**
W-50 UNDET	5 LB*	7.50	7.50	7.50	7.50	
W-50 UNDET	20 LB	4.00	4.00	12.00	4.00	
	BOMBEX					**5**
Air-K	MK-83**	1.25	1.25	1.25	1.25	

**The use of 3.24 lb charges during AMNS training were conservatively modeled as 5 lb charges.*
*** One event using the MK-83 bombs consists of 4 bombs being dropped in succession. For example, in VACAPES Air-K there are 5 MK-83 events, which mean that a total of 20 bombs will be dropped per year.*

Figure J-3 Physiological and Behavioral Acoustic Effects Framework for Explosives



(Figure is not to scale and is for illustrative purposes only)

1.1.1 Metrics

Several standard acoustic metrics are used for underwater pressure waves in this document; textbooks on underwater sound (e.g., Urick, 1983) should be consulted for details. Four metrics are especially important for this analysis:

- *Energy flux density (EFD).* For plane waves, as assumed here, energy flux density (EFD) is the time integral of the squared pressure divided by the impedance. It has SI units of J/m^2 (but in-lb/in^2 is also used in CHURCHILL). EFD levels have units of dB re 1 μPa^2-s (using the usual convention that the reference impedance is the same as the impedance at the field point).
- *1/3-Octave EFD.* This is the energy flux density in a 1/3-octave frequency band. A 1/3-octave band has upper and lower frequency limits with a ratio of $2^{1/3}$. Hence, the bandwidth is about 25% of center frequency.
- *Positive impulse.* This is the time integral of the pressure over the initial positive phase of an arrival. SI units are Pa-s, but psi-ms are also used. There is no decibel analog for impulse.
- *Peak pressure.* This is the maximum positive pressure for an arrival. Units used here are psi and decibel levels with the usual underwater reference of 1 μPa.

1.1.2 Thresholds and Criteria for Injurious Physiological Effects

Single Explosion

For injury, the Navy uses dual criteria: eardrum rupture (i.e., tympanic-membrane [TM] rupture) and onset of slight lung injury. These criteria are considered indicative of the onset of injury. The threshold for TM rupture corresponds to a 50 percent rate of rupture (i.e., 50% of animals exposed to the level are expected to suffer TM rupture); this is stated in terms of an Energy Flux Density Level (EL) value of

1.17 inch pounds per square inch (in-lb/in^2) (about 205 dB referenced to 1 micro Pascal squared second (dB re 1 μPa^2-s)). This recognizes that TM rupture is not necessarily a serious or life-threatening injury, but is a useful index of possible injury that is well correlated with measures of permanent hearing impairment (Ketten [1998] indicates a 30% incidence of permanent threshold shift [PTS] at the same threshold).

The threshold for onset of slight lung injury is calculated for a small animal (a dolphin calf weighing 26.9 lbs), and is given in terms of the "Goertner modified positive impulse," indexed to 13 psi-millisecond (ms) (DoN, 2001). This threshold is conservative since the positive impulse needed to cause injury is proportional to animal mass, and therefore, larger animals require a higher impulse to cause the onset of injury. This analysis assumed the populations were 100% small animals. The criterion with the largest potential exposure range (most conservative), either TM rupture (energy threshold) or onset of slight lung injury (peak pressure threshold), will be used in the analysis to determine injurious physiological exposures.

For mortality, the Navy uses the criterion corresponding to the onset of extensive lung injury. This is conservative in that it corresponds to a 1 percent chance of mortal injury, and yet any animal experiencing onset severe lung injury is counted as a lethal exposure. For small animals, the threshold is given in terms of the Goertner modified positive impulse, indexed to 30.5 psi-ms. Since the Goertner approach depends on propagation, source/animal depths, and animal mass in a complex way, the actual impulse value corresponding to the 30.5 psi-ms index is a complicated calculation. To be conservative, the analysis used the mass of a calf dolphin (at 26.9 lbs) for 100% of the population.

Multiple Explosions

For this analysis, the use of multiple explosions only applies to FIREX with IMPASS and the MK-82 and MK-83 bombs used in BOMBEX. Since FIREX with IMPASS and portions of BOMBEX require multiple explosions, the Churchill approach had to be extended to cover multiple sound events at the same training site. For multiple exposures, accumulated energy over the entire training time is the natural extension for energy thresholds since energy accumulates with each subsequent shot (explosion); this is consistent with the treatment of multiple arrivals in Churchill. For positive impulse, it is consistent with Churchill to use the maximum value over all impulses received.

1.1.3 Thresholds and Criteria for Non-Injurious Physiological Effects

The Navy criterion for non-injurious physiological effects is TTS — a slight, recoverable loss of hearing sensitivity (DoN, 2001a). For this assessment, there are dual thresholds for TTS, an energy threshold and a peak pressure threshold. The criterion with the largest potential exposure range (most conservative), either the energy threshold or peak pressure threshold, will be used in the analysis to determine non-injurious physiological (TTS) exposures.

Single Explosion –TTS-Energy Threshold

The first threshold is a 182 dB re 1 μPa2-s maximum energy flux density level in any 1/3-octave band at frequencies above 100 Hz for toothed whales/sea turtles and in any 1/3-octave band above 10 Hz for baleen whales. For large explosives, as in the case of the Churchill FEIS, frequency range cutoffs at 10 and 100 Hz produce different results in the impact range estimates. For small explosives (< 1500 lb NEW), as what was modeled for this analysis, the spectrum of the shot arrival is broad, and there is essentially no difference in impact ranges resulting from the 10 and 100Hz frequency range cutoffs for toothed whales/sea turtles or baleen whales.

The TTS energy threshold for explosives is derived from the Space and Naval Warfare Systems Center (SSC) pure-tone tests for TTS (Schlundt *et al.* 2000, Finneran and Schlundt 2004). The pure-tone threshold (192 dB as the lowest value) is modified for explosives by (a) interpreting it as an energy

metric, (b) reducing it by 10 dB to account for the time constant of the mammal ear, and (c) measuring the energy in 1/3-octave bands, the natural filter band of the ear. The resulting threshold is 182 dB re 1 μPa2-s in any 1/3-octave band. The energy threshold usually dominates over the peak pressure threshold and is used in the analysis to determine potential non-injurious physiological exposures for single explosion ordnance.

Single Explosion –TTS-Peak Pressure Threshold

The second threshold applies to all species and is stated in terms of peak pressure at 23 psi-ms (about 225 dB re 1 μPa). This criterion was adopted for Precision Strike Weapon (PSW) Testing and Training by Eglin Air Force Base in the Gulf of Mexico (NMFS, 2006). It is important to note that for small shots near the surface (such as in this analysis), the 23-psi-ms peak pressure threshold generally will produce longer impact ranges than the 182-dB energy metric. Furthermore, it is not unusual for the TTS impact range for the 23-psi-ms pressure metric to actually exceed the behavioral impact range for the 177-dB energy metric.

Multiple Explosions –TTS

For multiple explosions, accumulated energy over the entire training time is the natural extension for energy thresholds since energy accumulates with each subsequent shot/detonation. This is consistent with the energy argument in Churchill. For peak pressure, it is consistent with Churchill to use the maximum value over all impulses received.

1.1.4 Thresholds and Criteria for Behavioral Effects

Single Explosion

For a single explosion, to be consistent with Churchill, TTS is the criterion for non-injurious effects. In other words, because behavioral disturbance for a single explosion is likely to be limited to a short-lived startle reaction, use of the TTS criterion is considered sufficient protection and therefore behavioral effects are not considered for single explosions.

Multiple Explosions

For this analysis, the use of multiple explosions only applies to FIREX with IMPASS and the MK-82 and MK-83 bombs used in BOMBEX. Because multiple explosions would occur within a discrete time period, a new acoustic criterion-behavioral disturbance -is used to account for behavioral effects significant enough to be judged as harassment, but occurring at lower noise levels than those that may cause TTS.

The threshold is based on test results published in Schlundt *et al.* (2000), with derivation following the approach of the Churchill FEIS for the energy-based TTS threshold. The original Schlundt *et al.* (2000) data and the report of Finneran and Schlundt (2004) are the basis for thresholds for behavioral disturbance. As reported by Schlundt *et al.* (2000), instances of altered behavior generally began at lower exposures than those causing TTS; however, there were many instances when subjects exhibited no altered behavior at levels above the onset-TTS levels. Regardless of reactions at higher or lower levels, all instances of altered behavior were included in the statistical summary.

The behavioral disturbance threshold for tones is derived from the Spawar Systems Center (SSC) tests, and is found to be five dB below the threshold for TTS, or 177 dB re 1 μPa2-s maximum energy flux density level in any 1/3-octave band at frequencies above 100 Hz for toothed whales/sea turtles and in any 1/3-octave band above 10 Hz for baleen whales. As stated previously for TTS, for small explosives (< 1500 lb NEW), as what was modeled for this analysis, the spectrum of the shot arrival is broad, and there is essentially no difference in impact ranges for toothed whales/sea turtles or baleen whales. In shallower water, the behavioral disturbance exposure range can be about twice the exposure range for

TTS. However, in deeper water, the TTS pressure criteria (23 psi) exposure range can result in a longer exposure range than the behavioral disturbance criteria exposure range. This is due to the fact that in a deep water environment, it is more likely that there is a direct path for the shockwave to propagate, which results in a larger peak pressure range. In shallow water, there is reflection, absorption, and cancellation of the shockwave propagation due to interactions with the bottom, sediment type, etc., which can limit the peak pressure range.

1.2 Summary of Thresholds and Criteria for Impulsive Sounds

Table J1-4 summarizes the effects, criteria, and thresholds used in the assessment for impulsive sounds. Non-injurious effects are determined by either the dual physiological criteria for single detonations or by behavioral criterion for multiple detonations. The criteria for behavioral effects without physiological effects used in this analysis are based on use of multiple explosives that only take place during an FIREX with IMPASS event or a BOMBEX event involving MK-82 and MK-83 bombs.

Table J1-4 Effects, Criteria, and Thresholds for Impulsive Sounds

Effect	Criteria	Metric	Threshold
Mortality	Onset of Extensive Lung Injury	Goertner modified positive impulse	indexed to 30.5 psi-ms (assumes 100% small animal at 26.9 lbs)
Injurious (Physiological)	50% Tympanic Membrane Rupture-PTS[1]	Energy flux density	1.17 in-lb/in2 (about 205 dB re 1 μPa2-s)
Injurious (Physiological)	Onset Slight Lung Injury	Goertner modified positive impulse	indexed to 13 psi-ms (assumes 100% small animal at 26.9 lbs)
Non-injurious (Physiological)	TTS [2]	Greatest energy flux density level in any 1/3-octave band (above 100 Hz for toothed whales/sea turtles and above 10 Hz for baleen whales) - for total energy over all exposures	182 dB re 1 μPa2-s
Non-injurious (Physiological)	TTS	Peak pressure for any single exposure	23 psi
Non-injurious (Behavioral)	Behavioral Disturbance	Greatest energy flux density level in any 1/3-octave (above 100 Hz for toothed whales/sea turtles and above 10 Hz for baleen whales) - for total energy over all exposures (multiple explosions only)	177 dB re 1 μPa2-s

[1] Permanent Threshold Shift

[2] Temporary Threshold Shift

CHAPTER 2 ACOUSTIC ANALYSIS FOR UNDERWATER EXPLOSIONS ASSOCIATED WITH FIREX WITH IMPASS

2.1 Summary Description of the Action

A typical FIREX with IMPASS evolution is summarized below.

- Under all Alternatives, the plan is for up to 22 events per year in the VACAPES Range Complex. The duration of an event is several hours.
- Each event is comprised of a "Pre-FIREX" test followed by a FIREX consisting of at least 6 "missions."
- "Pre-FIREX" consists of 4 live rounds to support Trend Analysis in order to remove mechanical error from the Fall of Shot (FOS). These rounds are fired at a one-minute cycle rate. This is followed by 2 live rounds fired for Trend Analysis Verification at a 10-second cycle time. Error distance between where the shell impacts and the target point is assumed to be less than 100 yards (yards) (~ 91 meters [m]).
- The first "mission" begins within 45 minutes of the last pre-FIREX round.
- For each event there are a minimum of 6 "missions," with approximately 5-10 minutes between each mission. These missions include:
  - ***AREA Target*** (6 live rounds, 10-second cycle time)
  - ***Danger Close*** (5 live rounds, 10-second cycle time)
  - ***Coordinated Illumination*** (4 live rounds, 20-second cycle time)
  - ***Counter Mech*** ((4 live rounds, 10-second cycle time)
  - ***SEAD*** (4 live rounds, 10-second cycle time)
  - ***Re-fire*** (4 live rounds, 10-second cycle time)

  If a mission fails, a ***Do Over*** mission of up to 6 live rounds is executed.
- All rounds for a given mission are expected to impact within 50 yards (45 m) of the target point.
- The modeled typical event involves firing a total of 39 rounds (6 rounds for pre-FIREX, and 4-6 rounds for each of 6 mission types and one 6-round ***Do Over***).

2.2 Characterization of Source Properties

For the acoustic analysis, the exploding shell is characterized here as a point source, with an 8 pound net weight of high-energy explosive.

2.2.1 Depths of Animals and Explosions

Although the 5-inch shells are set to detonate on contact with the ocean surface, actual detonation depth is not known. For this analysis, an assumption of a 1 ft (0.3 m) depth is made. Animal depths are selected to ensure the greatest direct path for the harassment ranges, and to give the greatest impact range for the injury thresholds; they are thus conservative. The latter is consistent with the approach of CHURCHILL.

2.2.2 Similitude Formulas for Source Properties

Standard similitude formulas are used to model the free-field source properties close to the source, starting at a nominal source-level range of 1 m (3.3 ft). Weak shock theory is used to estimate the waveform and levels to ranges beyond a few meters. Rather than revert to linear propagation theory

when the amplitudes are small, the weak shock is used to all ranges. This is consistent with the SEAWOLF and CHURCHILL FEISs (although not explicitly stated in the documents). References for similitude and explosive sound propagation include Cole (1948), Arons *et al.* (1949), Weston (1960), Urick (1983), Goertner (1982), Gaspin (1983), Chapman (1988), Gaspin and Shuler (1971), and Bluy and Payne (1974). The formulas are provided below.

Waveform for Shock Wave, Positive Phase (Similitude, Arons et al., 1949):

The pressure as a function of time at a fixed location is given by:

$P(t) = P_o \exp(-t/t_o)$, for $t > 0$, and

$P(t) = 0$, $t < 0$,

where P_o is peak pressure, t is time (with $t = 0$ as arrival time of the shock front), and t_o is time constant. This is an idealized waveform, and does not include negative phase or bubble pulses. The latter is not at issue for shots at the surface. Negative pressure disturbances are treated here for the case of the surface reflected path.

Peak Pressure of Shock Wave (Similitude, Arons et al., 1949):

Peak pressure in psi is given by:

$$P_o = 2.16 \times 10^4 \, (W^{1/3}/R)^{1.13}$$

where W is net explosive weight (NEW) in pounds, and R is range in feet.

Time Constant for Shock Wave (Similitude, Arons et al., 1949):

The 1/e time in ms is given by:

$$t_0 = 0.052 W^{1/3} \, (W^{1/3}/R)^{-0.26}$$

where W is NEW in pounds and R is range in feet.

Positive Impulse for Shock Wave (Similitude, Arons et al., 1949):

Positive impulse is calculated directly from the time integral of the pressure over the positive phase.

Goertner (1982) Modified Positive Impulse

As in the CHURCHILL FEIS, this document utilizes the Goertner (1982) approach to determine the positive impulse. In this approach, either: (1) a surface reflected impulse, or (2) a lung/bubble resonance period is used to modify the positive impulse at various ranges and depths. For a pressure-release surface, the reflected pulse is the negative of the incident, with perhaps a reduction in amplitude and distortion of the waveform. The result of combining the surface reflected and direct paths is a reduction in positive impulse. Similarly, the lung/bubble resonance period cuts off the decaying peak pressure. The Goertner modified positive impulse is the integral of the pressure from the start of the arrival of the direct-path impulse until the start of the arrival of the surface-reflected pulse (or the period of the resonance). The minimum of the two integrals is calculated as a function of animal depth, and compared to the Goertner depth-dependent threshold. Since the maximum range over the possible animal depths is used in the analysis, the estimated impact ranges are conservative.

Energy Flux Density (Similitude, Arons et al., 1949):

EFD is calculated directly from the time integral of the squared pressure, normalized by impedance.

Energy Flux Density Spectrum (Similitude, Weston, 1960):

The EFD spectrum is the squared modulus of the Fourier transform of the exponential waveform. It can be written as:

$$E = \{2P_o^2\} / \{\rho c\ (1/t_o^2 + 4\pi^2 f^2)\}$$

where E is in ergs/cm^{2}Hz, P_o is the peak pressure in μPa, $\rho c = 1.539 * 10^5$ g/cm^2-s, t_o is time constant in seconds, and f is frequency in Hz.

Dependence of Formulas on the Type of Explosive

All of the formulas above assume TNT as the high-explosive material. For other explosives, the formulas remain the same, but an adjustment is made for the density of the explosive relative to TNT. For example, RDX has a density about 15% greater than TNT. For an 8-lb RDX charge, a 9.2-lb NEW would be used in the formulas.

2.3 Environmental Provinces and Sound Propagation

2.3.1 Overview

For an ideal, deep-water environment (flat pressure-release surface, constant sound speed, no absorption, no bottom interaction, source and receiver away from the surface) and a single explosion, impact ranges associated with the acoustic thresholds defined in Section 1.3 can be estimated using standard formulas for shock waves. For a single 8-lb NEW charge at a depth of 1 ft (0.3 m), the MMPA-Level B harassment range is determined from the 23-psi TTS threshold to be approximately 295 m (320 yards). Injury ranges are approximately 45 m (50 yards) for small animals.

Because training would occur year-round, the assumption of an ideal, deep-water environment would not always be appropriate. In fact, FIREX with IMPASS may be deployed in waters as shallow as 50 m (55 yards). To estimate impact areas for the variety of FIREX with IMPASS deployment sites, Navy standard acoustic models and databases were applied to environmental 'provinces' within which the ocean acoustic environments are expected to be similar. The environmental provincing follows naturally from the Navy databases, and yields from 45 to 80 provinces in each OPAREA for each season. Examples of a province chart and province properties are found at the end of this Section.

Based on the Navy standard CASS/GRAB model (OAML, 2002), modified to account for impulse response, shock-wave waveform, and nonlinear shock-wave effects, and on the Navy (OAML, 2002) standard environmental databases (sound speed, wind speed, bottom interaction, and bathymetry), impact ranges were estimated for each season and province. Note that the model is validated for use of the highly specialized bottom sediment databases and for range-varying environments. In addition, test calculations were made to account for bubble pulses.

Impact ranges and impact areas were estimated for many cases (1 OPAREA, 40 to 80 provinces per OPAREA, 4 seasons, and eight impact thresholds) -- too many to list here (approximately 1,000 cases for 1 shot alone). The results are thus summarized in Table J2-2 according to intervals of water depth (e.g., locations for which water depths are between 100 m (110 yards) and 1,000 m [1,100 yards]).

2.3.2 Propagation Modeling

The approach begins with a high-fidelity acoustic model that has all of the required properties for the 'linear' problem. Since the OPAREA of interest includes shallow-water regions, the selected model must treat range-dependent environments and be able to exploit Navy standard bottom-sediment interaction approaches (e.g., the Navy Standard: OAML, 2002). It must cover a wide frequency band (up to about 10 kHz), and correctly account for caustics, surface cutoff, ducting, low-frequency cutoff, and important diffraction effects. Because of the wide bandwidth for small shots, wave-theory models (such as modal theory or parabolic equation method or finite-element approaches) are usually not practical, so that modified ray theory models are favored. Examples include Navy standard models (CASS/GRAB or ASTRAL) and the model used for long-range, flat bottom estimates in CHURCHILL and SEAWOLF -

the REFMS model (Britt *et al.*, 1991). The CASS/GRAB model is well suited for small shots and is used in this assessment.

Consider first the linear case. The approach is to first calculate the impulse response of the channel. This is one of the standard applications for the CASS/GRAB model. Let $\delta(t)$ be the delta function, $s_o(t)$ be the pressure waveform at the source (at 1 m from the source), and $S(s_o(t), x; t)$ be the pressure time series of the field at location x. Then:

$S(\delta(t), x; t)$ is the impulse response at location x.

Now, $S(s, x; t)$ is linear in s, and it is trivially the case that $s_o(t) = s_o(t) \otimes \delta(t)$, where $\otimes$ denotes convolution. Hence,

$$S(s(t) , x; t) = S(s(t) \otimes \delta(t), x; t) = s (t) \otimes S(\delta(t), x; t).$$

Thus, given the impulse response, the field for any source waveform is available through simple convolution. This is a standard approach in sound wave modeling (e.g., Clay and Medwin, 1977).

The starting field (e.g., at 1 m), s(t), is prescribed as an idealized, exponentially decaying shock wave, followed by double-exponential bubble pulses, with negative pressures in between to ensure the impulse is zero (e.g., Weston, 1960).

The peak pressures of the bubble pulses are smaller than the peak pressure of the main pulse. The same is true for the positive impulse and the total energy. However, the bubble pulse contributions can change the shape of the energy spectrum. In the FIREX WITH IMPASS case, with small shot and shallow depth, the bubble pulse frequency is below 1 Hz, and the spectral modification does not affect which 1/3 octave band has greatest level. Thus, bubble pulse contributions are not included in these calculations. Note that for the approach used here, it is no more difficult to include the bubble pulses, but there is no reason to add this complication to the problem.

In regions of high pressure, non-linearities can be important -- particularly in the rate of decay of the peak pressure and in the increasing time constant for the pressure wave. Although total energy is minimally affected, the energy spectrum is sensitive to nonlinear effects. The usual approach to incorporating these effects in a ray model is to propagate the waveform for each ray path according to the similitude formulas. This is what is done, for example, in REFMS (Britt *et al.*, 1991).

The non-linear correction is made as follows. Let $S_n(x; t)$ be the idealized similitude waveform at location x, over time t. Then, for ranges at which the peak pressure is greater than 100 psi, the field is estimated as:

$$S(s(t) , x; t) = [\, | x |^{2} S_n(x; t)] \otimes S(\delta(t), x; t)$$

Since the model yields the full time series at each location, it can directly calculate the peak pressure, positive impulse, Goertner modified positive impulse, energy spectrum, and frequency-band values (e.g., 1/3 octave band) of the EFD. This model uses the same (similitude) approach to account for non-linearities in water-borne shock wave propagation as does the REFMS model.

Note on Propagation by Weak Shock Theory

Weak shock theory dates to the 19th century and is used in all types of shock wave propagation (in air, in water, etc.). Gaspin (1983) recommends that it be used beyond a range of:

$$R_o = 12.0 * W^{1/3}$$

where W = explosive weight in pounds, and R_o = 'limiting range' in feet. For an 8-lb NEW charge, the range is only 24 ft (7.3 m). The recommendation is to use the similitude formulas to range R_o, and the weak shock formula, thereafter.

The weak shock formulas are:

$$P = Po * \{[1 + 2 * (R_o/L_o) * Ln (R/ R_o)]^{½} - 1\} / \{[R/ L_o] * Ln (R/ R_o)\}$$

$$T = To * [1 + 2 * (R/ L_o) * Ln (R/ R_o)]^{½}$$

where: $L_o = (\rho c^3 T_o) / (P_o \beta)$, P_o = peak pressure at R_o, T_o= time constant at R_o , ρc = acoustic impedance for seawater, β= coefficient of non-linearity for water (3.5).

These formulas have been published many times, with a recent, relevant example in Richardson *et al.* (1995). What is sometimes not noted is the comparison of the weak shock formulas with the similitude formulas, although Rogers (1977) does address this quite well. In particular, note that the weak shock theory and the Arons *et al.* (1949) similitude formulas are within 20% of each other for most parameters of interest in this assessment.

2.3.3 Underwater Explosive Measurements for Validation

Because of the special geometry of FIREX with IMPASS (especially the shallow and uncertain depth of the explosions), there are very few measurements that can be used directly to estimate the sound field. Measurements for small shots and deeper depths are available for some of the FIREX with IMPASS sites, and they are useful for determining bottom interaction properties. Results for these data sets have in most cases been analyzed and incorporated into the Navy databases (OAML, 2002) (which are used for this assessment). In that sense, the risk estimates have exploited the available propagation data.

2.4 Estimated Impact Ranges and Areas for a Single Exploding Shell

For a single 8-lb NEW charge, impact ranges are relatively short, and there is little dependence on season, water depth, or bottom properties for the OPAREA covered. Model estimates are summarized in **Table J2-1**.

The impact ranges for TTS based on energy levels are the same for both frequency limits (10 Hz and 100 Hz) in all cases for small explosives because of the broadness of the frequency spectrum. The same is true for behavioral disturbance.

There is little variability due to environmental conditions for any of the impact ranges in **Table J2-1**. In fact, the only case for which there is some variability (the TTS range for energy threshold), shows that most of this variability occurs in shallow water (less than 100 m (328 ft)). This result is as expected. However, greater variability is found in the estimation of TTS impact areas for multiple explosives -- primarily because of energy accumulation and hence, greater ranges for multiple shots.

Table J2-1 Estimated Impact Ranges[1] for Cetaceans and Sea Turtles for Explosion of a Single 5-Inch Shell

Criterion and Threshold	Estimated Impact Range
MMPA-Level A Harassment: 50% tympanic membrane (TM) rupture. Threshold: Energy above 1.17 in-lb/in2 [205 dB re 1 μPa2-s]	15-25 m (16 -28 yds)
MMPA-Level A Harassment: Onset of slight lung injury. Threshold: Goertner modified positive impulse exceeds threshold indexed to 13 psi-ms	40-45 m (44-50 yds)
MMPA-Level B Harassment: TTS for baleen whales. Threshold: 1/3 octave-band energy flux density level above 10 Hz exceeds 182 dB re 1 μPa2-s	71-80 m (78-88 yds)
MMPA-Level B Harassment: TTS for toothed whales and sea turtles. Threshold: 1/3 octave-band energy flux density level above 100 Hz exceeds 182 dB re 1 μPa2-s	71-80 m (78-88 yds)
MMPA-Level B Harassment: TTS. Threshold: 23 psi peak pressure [225 dB re 1 μPa]	255-275 m (280-300 yds)
MMPA-Level B Harassment: Behavioral disturbance for baleen whales. Threshold: 1/3 octave-band energy flux density level above 10 Hz exceeds 177 dB re 1 μPa2-s (multiple explosions only)	140-150 m (155-165 yds)
MMPA-Level B Harassment: Behavioral disturbance for toothed whales Threshold: 1/3 octave-band energy flux density level above 100 Hz exceeds 177 dB re 1 μPa2-s (multiple explosions only)	140-150 m (155-165 yds)

[1] ***These impact ranges assume detonation occurs at 1 ft (0.3 m) below the water's surface.***

2.5 Impact Areas for Marine Mammals for a Full FIREX with IMPASS Event (39 Explosions)

Impact areas for a full FIREX WITH IMPASS event must account for the time and space distribution of 39 explosions, as well as the movement of animals over the several hours of the exercise. The reason is that impact areas depend on whether an animal is exposed to a single pressure wave or multiple waves over time.

As is discussed in detail below, the total impact area for the 39-shot event is calculated as the sum of small impact areas for 7 FIREX missions (each with 4-6 shells fired) and 1 pre-FIREX action (with 6 shells fired). For a single 5-shell mission, the total impact area is typically small (< 0.2 nm^2) and impact ranges also small (< 500 m (550 yards)). Because target locations are changed from mission to mission and because of the time lag between missions, it is highly unlikely that a cetacean would be within the small impact zone for more than one mission.

Section 2.5.1 outlines the approach to estimating the impact ranges and areas, and Section 2.5.2 gives an example in detail of the take estimate calculations for a typical case. Section 2.5.3 summarizes the resulting total impact areas for the FIREX WITH IMPASS OPAREA and representative depth strata.

2.5.1 Example of How the Calculations of Estimated Impact Areas Are Made

The nominal FIREX with IMPASS event can be broken down into two components: 1) a 6-round Pre-FIREX, and 2) seven FIREX missions, each with 4-6 rounds. The time between pre-FIREX and the first FIREX mission, as well as the time between the individual FIREX missions is sufficiently large as to allow these components to be examined independently (i.e., their small impact areas calculated). The total impact area for an event can be calculated by adding together the component areas for the Pre-FIREX and the 7 FIREX missions.

In order to determine the size of the area potentially impacted for each component of the mission, an estimate must be made of the time that a typical animal could be present in the impact area. This is necessary to correctly gauge the total energy exposure that an animal would receive if exposed to the sound of more than one explosion.

Additionally, inaccuracies in the location of the shell impact points need to be included in this analysis. The reason is that, for the peak pressure threshold for harassment, the harassment area depends on the relative location of the shell impact locations. The nominal targeting error (i.e., the radius within which all shells should nominally land) based on previous training exercises is 100 yards (91m) for the Pre-FIREX rounds and 50 yards (46 m) for an entire mission's fire. Therefore, the six Pre-FIREX rounds should land within 100 yards (91 m) of the targeting point, and all 4-6 mission rounds should land within 50 yards (46 m) of the targeting point for that mission.

For small explosives detonated near the sea surface, the impact range for MMPA-Level B harassment for a single explosive is often determined by the 23-psi peak-pressure threshold for TTS, even for the typical multiple shots encountered in a single mission.

TTS Harassment Calculation – Pre-FIREX Fire

For Pre-FIREX, four rounds (for Trend Analysis) are fired with a one-minute cycle time, followed by two rounds (for Verification) with a ten-second cycle rate. The target error is less than 100 yards (91 m).

For the peak pressure threshold for TTS, the impact area is no greater than the impact area of five widely-spaced shots (this assumes that the two verification rounds are nearly coincident in time and space) or:

$$\text{Area} = \pi * (300/2025)^2 * 5 = 0.345 \text{ nm}^2$$

where 300 yards is the impact range for 23-psi peak pressure threshold.

For the TTS energy threshold, the expected area is estimated to be no greater than:

$$\text{Area} = \pi * (215/2025)^2 = 0.035 \text{ nm}^2,$$

where 215 yards is the impact range for six shots.

TTS Harassment Calculation – Typical Mission

For the typical mission consisting of five rounds, the expected impact area is no greater than:

$$\text{Area} = \pi * ((300 + 50 + 68)/2025)^2 = 0.134 \text{ nm}^2$$

for the peak pressure threshold, and no greater than:

$$\text{Area} = \pi * (197/2025)^2 = 0.030 \text{ nm}^2,$$

for the energy threshold where 197 yards is the impact range for five shots. The peak pressure estimate assumes that the five rounds fall within 50 yards of the target, that the five rounds fall within 40 seconds, and that the average animal-swim distance for 40 seconds is about 68 yards (for a 3 knot or 1.7 yards/sec swim speed).

Following the same approach, expected impact areas are derived below.

Behavioral Disturbance – Pre-FIREX Fire

Estimated area based on energy threshold is:

$$\text{Area} = \pi * ((405)/2025)^2 = 0.126 \text{ nm}^2$$

where 405 yards is the impact range for six shots.

Behavioral Disturbance – Typical Mission

Estimated area based on energy threshold is:

$$\text{Area} = \pi * ((370)/2025)^2 = 0.105 \text{ nm}^2$$

where 370 yards is the impact range for five shots.

Injury Calculation – Pre-FIREX Fire

Estimated area based on positive impulse threshold is:

$$\text{Area} = \pi * (35/2025)^2 * 5 = 0.005 \text{ nm}^2$$

where 35 yards is the impact range for a single shot.

Estimated area based on energy threshold is:

$$\text{Area} = \pi * (69/2025)^2 = 0.004 \text{ nm}^2$$

where 69 yards is the impact range for six shots.

Injury Calculation – Typical Mission

Estimated area based on the positive impulse threshold is:

$$\text{Area} = \pi * (35/2025)^2 * 5 = 0.005 \text{ nm}^2$$

Estimated area based on the energy threshold is:

$$\text{Area} = \pi * ((63)/2025)^2 = 0.003 \text{ nm}^2$$

where 63 yards is the impact range for five shots.

Total Areas per Event

For **injury**, the total expected area per event is:

Total Area = Area (of one Pre-FIREX fire) + 2 * Area (one six-round mission) +
Area (one five-round mission) + 4 * Area (one four-round mission)
= 0.005 + 2 * (0.006) + 1 * (0.005) + 4 * (0.004) = 0.038 nm^2

For **TTS,** the total expected area is:

Total Area = Area (of one pre-calibration fire) + 2 * Area (one six-round mission) + Area (one five-round mission) + 4 * Area (one four-round mission) – Total Injury Area
= 0.345 + 2 * (0.145) + 1 * (0.134) + 4 * (0.123) – 0.038 = 1.223 nm^2.

For **behavioral disturbance**, the total expected area is:

Total Area = Area (of one pre-calibration fire) + 2 * Area (one six-round mission) + Area (one five-round mission) + 4 * Area (one four-round mission) – Total Injury Area – Total TTS Harassment Area
= 0.126 + 2*(0.126) + 1*(0.105) + 4*(0.083) – 0.038 – 1.223 = – 0.446 nm^2.

The negative total area derived for behavioral disturbance is the result of the factors in the analysis: (1) a peak pressure metric used to determine TTS (and injury) but not for behavioral disturbance, and (2) the peak pressure threshold being used (23 psi) is not entirely scaled for the eight-point source.

These total areas, when multiplied by the animal densities, provide the take estimates for that animal species for the nominal exercise case of 39 five-inch shells, as previously described.

Note that although these are presented as "total areas" of harassment in order to calculate takes, this "total area" would not be impacted at any one time. The potential impacts would occur within a series of small impact areas associated with the pre-calibration rounds and missions, spread out over a period of several hours.

2.5.2 Summary of Estimated Impact Areas for Marine Mammals for a Full FIREX with IMPASS Event (39 Explosions)

Impact areas were estimated for each of the 50-80 environmental provinces in each OPAREA. Because sound propagation and animal densities are sensitive to water depth, a useful summary of the estimates is by depth strata. Note that the depth strata for the acoustic modeling were based on approximate 'octaves.' That is, the strata had depth intervals of 35-70 m, 70-150 m, 150-300 m, etc. Each was assigned a 'mean' water depth, with resulting values of 50, 100, 200, 500, 1000, 2000, and 4000 m.

A summary of the resulting impact areas is given in **Table J2-2** for the VACAPES Range Complex and for selected depth strata.

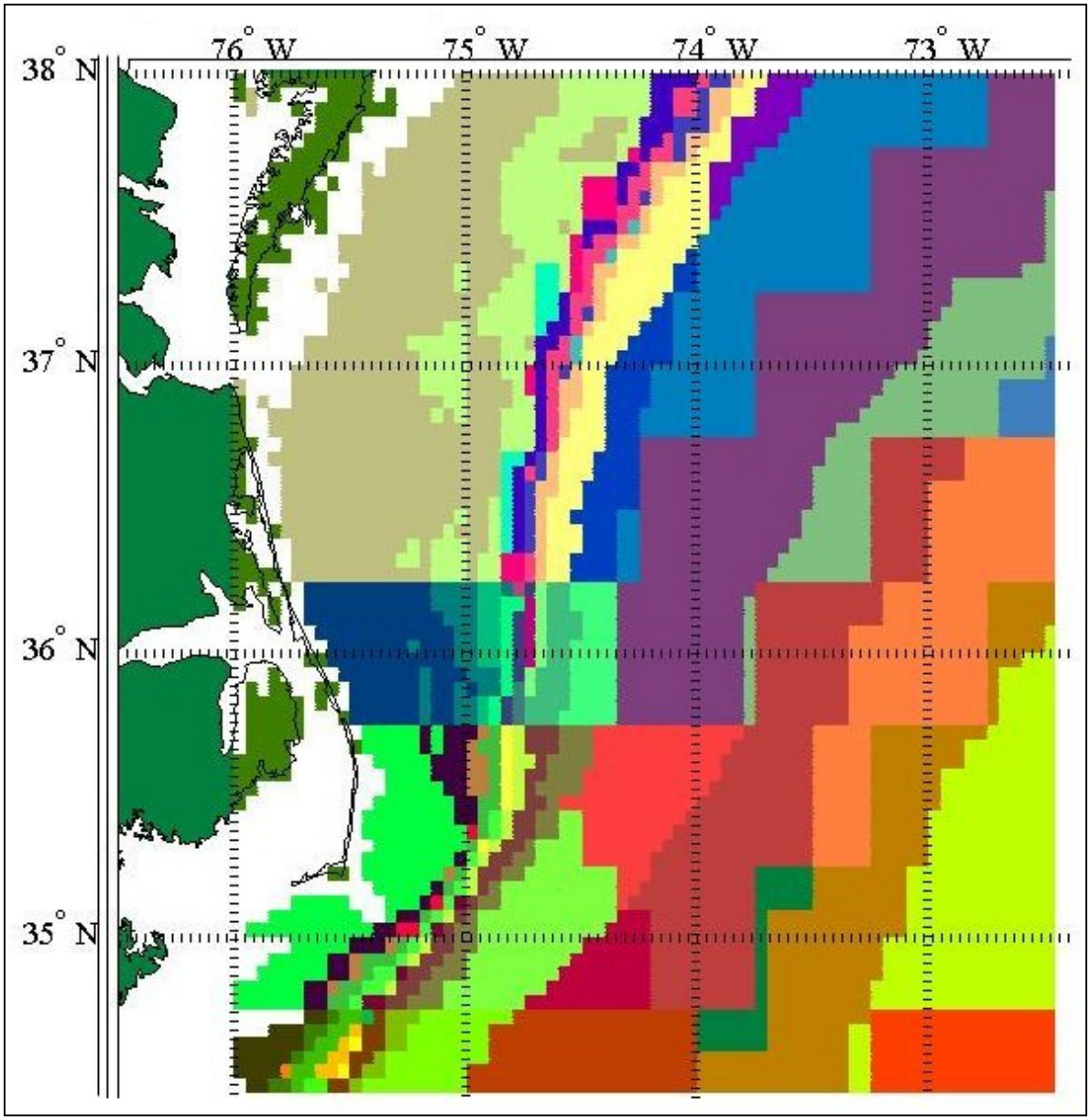
Estimates for a given depth stratum are weighted averages of impact areas for those provinces which are within the depth limits. The weighting is according to the areas of the provinces. This weighted averaging is consistent with the assumption that a training site is equally likely to occur anywhere within the depth limits.

Table J2-2 Estimated Impact Areas for a Single 39-Shell Event (nm^2)

OPAREA	Depth Stratum	Impact Area for Injury @ 205 dB re 1 μPa^2-sec or 13 psi	Impact Area for TTS @ 182 dB re 1 μPa^2-sec or 23 psi	Impact Area for Behavioral Disturbance @ 177 dB re 1 μPa^2-sec (multiple detonations only)
VACAPES	50 m – 100 m	0.048-0.048	1.09-1.17	0.49-1.66
VACAPES	100 m – 1000 m	0.048-0.048	1.09-1.11	0.00-0.00*
VACAPES	> 1000 m	0.048-0.048	1.09-1.11	0.00-0.00*

*In these areas, which occur in deeper water, the 23 psi criterion dominates over the 177 dB re 1 μPa^2-sec behavioral criterion and therefore was used in the analysis.

It is important to note here that there was a general lack of seasonal dependence for the impact area calculations. There was also little dependence on animal depth (assuming the conservative case that the animal is not close to the surface and do not benefit from the effects of surface 'cutoff'). In deep water, because the impact ranges are relatively short, the bottom and sound speed properties have little effect on sound propagation and the impact areas are typically about the same throughout.



Example: Geographic Chart of Acoustic-Environmental Provinces for the VACAPES OPAREA

Example: Province Parameters for Depth Regime, Sound Speed, and Sediment Properties for First 40 Provinces in VACAPES

VACAPES OPAREA				
Province Number	**Average Water Depth (m) for Depth Regime**	**OAML Bottom Class**	**OAML Sound Speed Index**	**OAML Sediment Thickness (2-way travel time, in seconds)**
0	20	0	142	0.2
1	50	0	142	0.2
2	100	96	142	0.2
3	200	96	142	0.2
4	500	94	142	1.82
5	1000	97	142	2.48
6	2000	97	142	3.47
7	2000	78	142	4.62
8	4000	78	142	4.32
9	4000	80	142	3.5
10	4000	152	142	3.07
11	4000	152	145	2.91
12	100	0	142	0.2
13	500	96	142	0.39
14	1000	96	142	0.79
15	4000	79	142	3.81
16	500	97	142	1.07
17	20	0	132	0.2
18	50	0	132	0.2
19	100	96	132	0.2
20	200	96	132	0.33
21	500	96	132	0.56
22	1000	97	132	2.25
23	2000	97	132	3.3
24	2000	78	132	3.95
25	4000	78	132	4.17
26	4000	79	132	3.89
27	50	96	132	0.2
28	500	97	132	1.35
29	100	0	132	0.2
30	2000	79	132	4.23
31	4000	80	132	3.56
32	200	97	132	1.01
33	20	0	114	0.2
34	50	0	114	0.23
35	50	96	114	0.2
36	100	96	114	0.55
37	200	96	114	0.82
38	500	96	114	0.49
39	1000	97	114	3.6

CHAPTER 3 ACOUSTIC ANALYSIS FOR UNDERWATER EXPLOSIONS ASSOCIATED WITH BOMBEX AND MISSILEX

The following material provides an explanation of the marine mammal acoustic effects model used to estimate the acoustic impact of explosive ordnance associated with BOMBEX and MISSILEX training on marine mammals and sea turtles. The best available data were used in combination with an underwater explosion model and exercise simulation to predict impacts. The method by which predicted effects were quantified is described. Under the No Action and Alternative 1, BOMBEX training could take place in two locations (Air-K and Air-3B). Under Alternative 2, BOMBEX training will only take place in one location (Air-K). MISSILEX training occurs in three locations (Air-E,F, I,J, W-72A(2) and Air-K) under all Alternatives. See Figures 1-1 and 1-2 for exercise locations.

3.1 MODEL DESCRIPTION

The modeling consists of five process components:

1. An exercise description including the type of weapons and acoustic sources used and their associated timelines and characteristics.
2. A physical oceanographic and geo-acoustic dataset for input to the acoustic propagation model for the planned exercise location and time of year.
3. An acoustic propagation model suitable for the source type to predict energy levels at ranges and depths from the source.
4. Marine animal density data for the test area.
5. A final calculation to multiply together the acoustic propagation results, the animal densities, and the number of operations.

3.1.1 Exercise Description

A timeline and sequence of weapon delivery was constructed from these records to form the basis of the test simulation. From this information, the order of weapon use, number of weapons fired, and time over which the weapons were fired is constructed.

3.1.2 Environmental Information for the Acoustic Propagation Model

Oceanographic data representative of the exercise locations were used to estimate propagation of the blast and acoustic energy using an analytical time-domain model for underwater explosions.

Environmental data parameters include bathymetry, sound speed profiles (SSP), and bottom type parameters including sediment characteristics, compressional and shear wave speed, density, and layer depth.

3.1.2.1 Bathymetry

The center latitude/longitude of the exercise boxes were used to determine the representative depth for each exercise location. The sites used for analysis of BOMBEX and MISSILEX were identified as VACAPES Air-K, VACAPES Air-3B , VACAPES Air E,F,I,J, and VACAPES W-72A(2).

3.1.2.2 Ocean Water Characteristics

Acoustic propagation at the exercise locations are mostly determined by the SSP due to deep water depths. For modeling, the SSP was partitioned into isovelocity water layers in order to calculate and predict propagation of blast and acoustic energy. Environmental databases used for this analysis are limited to those that were unclassified. The Naval Oceanographic Office online

Generalized Digital Environment Model, version 2.5 was used to obtain monthly SSPs, which were accessed at https://128.160.23.42/gdemv/gdemv.html. Twelve SSPs, the average for each month, were examined for the most conservative, which is defined as the profile that results in the best propagation conditions and largest zone of influence (ZOI) for the test. The SSP was then partitioned into isovelocity layers so that no layer had a change in sound speed greater than 3.28 ft/s (1 m/s) for the model input file.

3.1.2.3 Ocean Sediment Characteristics

Given a description of the bottom sediment, the sound speed ratio and density were acquired from the database of Hamilton (1980). Parameters used in the selected acoustic model to define ocean sediments are the sediment velocity ratio and wet density. Specifically, the sediment shear wave velocity is calculated from the sediment velocity ratio as a function of the compressional wave velocity, also called sediment sound speed.

3.1.3 Acoustic Propagation Model

Only explosive sources were utilized and the Reflection and Refraction Multi-Layered Ocean/Ocean Bottoms with Shear Wave Effects (REFMS) model (version 5.06) (Britt *et al.* 1991) was used for the acoustic predictions. REFMS is used to calculate peak maximum and minimum pressures, positive impulse, EFD total and 1/3 octave band spectra, and maximum EFD above 10Hz and above 100 Hz from underwater detonations. The REFMS model calculates the combined reflected and refracted shock wave environment for underwater explosions using a single, generalized model that is based upon Cagniard's linear wave propagation theory (Cagniard 1962; Britt *et al.* 1991), convolved with a nonlinear similitude source term for each individual source type. In order to predict propagation of the underwater explosions, some of the various explosive types are converted to TNT equivalents.

For the present determination of ZOIs for each mammal threshold, improvements were made to the REFMS tool to allow multiple depths and range points concurrently. Two separate case runs of REFMS were selected that concentrated points near the sea surface and detonation for impulse thresholds and a second distribution set that extended down to the sea floor and further away from the explosive for the peak pressure and EFD. The acoustic results of each were combined to yield a larger more comprehensive database for the mammal ZOI determinations. Thus, the discrete points of depth and range were;

Impulse Threshold

Depth (m): 0.5, 1.0, 2.0, 5.0, 15.0, 25.0, and 50.0

Range (nmi): 0.0026, 0.0087, 0.0148, 0.0207, 0.0415, 0.688, 0.1, 0.2, 0.3, 0.4, and 0.5

Peak Pressure and EFD Thresholds

Depth (m): 0.5, 1.0, 2.0, 5.0, 15.0, 50.0, 100.0, 150.0, and 200.0

Range (nmi): 0.0375, 0.05, 0.1, 0.2, 0.3, 0.4, 0.5, 1.0, 2.0, and 3.0

These two-dimensional (range and depth) distributions give 77 discrete points of REFMS results for evaluating the ZOIs of mammal thresholds based on peak positive impulse (psi-ms) and 90 points for ZOIs of thresholds in terms of the and peak pressure (psi) and EFD in 1/3-octave bands (dB) and total energy (dB). However, the numbers of points were reduced accordingly to accommodate the shallower depth (35m) of the VACAPES Air Kilo site.

3.1.4 Marine Animal Data

All density estimates that were used in the analysis are presented in the species descriptions located in Sections 3.7 and 3.8 of this EIS. Once the acoustic propagation model determines the impact areas or

ZOIs, then they are multiplied by the animal density estimates and the number of events to determine exposure estimates.

3.2 Estimated Impact Areas

Table J3-1 presents the BOMBEX modeling results of the impact areas for the VACAPES Range Complex. **Table J3-2** presents the MISSILEX modeling results of the impact ranges for the VACAPES Range Complex.

Table J3-1 Estimated ZOIs (km^2) for BOMBEX

Area	Ordnance	Estimated ZOI@ 177 dB re 1 μPa^2-s (multiple detonations only)				Estimated ZOI @ 182 dB re 1 μPa^2-s or 23 psi				Estimated ZOI @ 205 dB re 1 μPa^2-s or 13 psi				Estimated ZOI @ 30.5 psi			
		Win	Spr	Sum	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum	Fall
VACAPES																	
Air-K	MK-82	95.69	270.47	285.80	341.56	NA	NA	NA	NA	1.81	2.09	1.90	1.48	0.07	0.07	0.04	0.04
	MK-83	135.04	555.51	713.99	912.05	NA	NA	NA	NA	4.28	4.01	6.39	4.55	0.05	0.05	0.05	0.05
	MK-84	NA	NA	NA	NA	10.78	10.35	10.56	10.78	0.52	0.67	0.79	0.62	0.13	0.06	0.11	0.18
	MK-20	NA	NA	NA	NA	2.09	6.06	9.32	10.35	0.11	0.13	0.13	0.13	0.00	0.00	0.00	0.00
Air-3B	MK-82	54.55	129.00	327.15	204.84	NA	NA	NA	NA	1.99	1.99	2.28	2.18	<0.01	<0.01	<0.01	<0.01
	MK-83	68.97	200.17	456.67	360.00	NA	NA	NA	NA	4.84	4.98	5.74	5.74	<0.01	<0.01	<0.01	<0.01
	MK-84	NA	NA	NA	NA	11.65	11.65	12.34	11.88	1.40	0.84	0.62	0.57	<0.01	<0.01	<0.01	<0.01

Note: ZOIs for MK-82 and MK-83 bombs are modeled as multiple detonations (4 bombs dropped at same location). ZOIs for MK-84 and MK-20 bombs are modeled as single detonations.

Note: Events were either modeled for 177 dB re 1 μPa^2-sec due to multiple detonations (MK-82 and MK-83 BOMBEX) or modeled for 182 dB re 1 μPa^2-sec or 23 psi due to single detonations (MK-84 and MK-20 BOMBEX). Therefore, for MK-82 and MK-83 the NA refers to the criteria that were less dominant and therefore not used in the analysis. For MK-84 and MK-20 the NA refers to the fact that these events are not multiple detonations and therefore not modeled at 177 dB re 1 μPa^2-sec.

Table J3-2 Estimated ZOIs (km^2) for MISSILEX

Area	Ordnance	Estimated ZOI @ 182 dB re 1 μPa^2-s or 23 psi				Estimated ZOI @ 205 dB re 1 μPa^2-s or 13 psi				Estimated ZOI @ 30.5 psi			
		Win	Spr	Sum	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum	Fall
VACAPES													
Air-K	Hellfire	0.44	0.49	0.48	0.49	0.02	0.02	0.02	0.02	<0.01	<0.01	<0.01	<0.01
W-72A (2)	Hellfire	0.58	0.60	0.57	0.59	0.03	0.02	0.02	0.02	<0.01	<0.01	<0.01	<0.01
Air-E,F,I,J	Harm	0.73	0.73	0.52	0.67	0.05	0.05	0.05	0.05	<0.01	<0.01	<0.01	<0.01
Air-K	Maverick	1.99	2.80	10.56	1.64	0.09	0.07	0.07	0.09	0.04	0.02	0.04	0.04

CHAPTER 4 ACOUSTIC ANALYSIS FOR UNDERWATER EXPLOSIONS ASSOCIATED WITH MINEX

4.1 Introduction

This appendix provides explanatory text for a risk assessment of the MINEX site in the VACAPES Range Complex. The driving sources of shock energy and noise in the water are from small (5 or 20 pounds explosive weight) charges of C-4. The analysis is done in a per shot/season format, so that exposure estimates are easy to determine for any combination of sites and seasons.

Since the MINEX explosive events are isolated in time, and hence in the same category as the ship shock trials, temporary threshold shift (TTS) is the sole criterion for MMPA-Level B harassment.

4.2 Characterization of Source Properties

For the acoustic analysis, the exploding shell is characterized here as a point source, with a 5 lb or 20 lb charge of high-energy explosive.

4.2.1 Depths of Animals and Explosions

For this analysis an assumption of a 1 ft (0.3 m) depth is made, and is more conservative than an assumption of a shallower detonation depth. Animal depths are selected to ensure the greatest direct path for the harassment ranges, and to give the greatest impact range for the injury thresholds; they are thus conservative. The latter is consistent with the approach of CHURCHILL.

4.2.2 Similitude Formulas for Source Properties

See Section 2.2.2, all background information is the same as for the FIREX WITH IMPASS modeling.

4.3 Environmental Provinces and Sound Propagation

4.3.1 Overview

To determine impact areas for the MINEX deployment site, Navy standard acoustic models and databases were applied to environmental ‘provinces’ within which the ocean acoustic environments are expected to be similar. The environmental provincing follows naturally from the Navy databases.

4.3.2 Propagation Modeling

See Section 2.3.2, all background information is the same as for the FIREX WITH IMPASS modeling.

4.3.3 Underwater Explosive Measurements for Validation

Because of the special geometry of MINEX (especially the shallow and uncertain depth of the explosions), there are very few measurements that can be used directly to estimate the sound field. Measurements for small shots and deeper depths are available for some of the MINEX sites, and they are useful for determining bottom interaction properties. Results for these data sets have in most cases been analyzed and incorporated into the Navy databases (OAML 2002) (which are used for this assessment). In that sense, the risk estimates have exploited the available propagation data.

4.4 Estimated Impact Areas

As was the case, for FIREX with IMPASS, the modified CASS-GRAB shot-propagation model was used, together with existing environmental provinces for the MINEX site. Because the site is shallow (less than 50 m), propagation model runs were made for bathymetry in the range from 10 m to 40 m.

Also, as had been the case for FIREX with IMPASS, variations in estimated impact ranges varied as much within a single area as from one area to another. There was, however, little seasonal dependence.

As a result, the impact ranges are stated as mean value with a percentage variation. As a rule, in the case of ranges determined from energy metrics, the deeper the water the shorter the range.

Table J4-1 shows the results of the model estimation.

Table J4-1. Estimated Impact Areas

Threshold	Impact Area for 5-lb NEW	Impact Area for 20-lb NEW
Estimated Impact Area @ 13 psi-msec	0.03 sq km ± 10%	0.13 sq km ± 10%
Estimated Impact Area @ 182 dB re 1 μPa^2-sec	0.2 sq km ± 25%	0.8 sq km ± 25%

Injurious physiological impact areas are dominated by the onset slight lung injury criterion (13 psi-msec). TTS is the applicable criteria to determine non-injurious effects, and the impact areas are dominated by the energy threshold (182 dB re 1 μPa^2-sec). The results for the injurious physiological exposures resulting from the 13 psi criterion showed that there would be zero mortality exposures, so the modeling was not completed for the 30.5 psi mortality criteria.

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APPENDIX K

REGULATORY FRAMEWORK

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APPENDIX K
RESOURCE DESCRIPTIONS INCLUDING LAWS AND REGULATIONS CONSIDERED

This appendix provides a general description of each resource and addresses the Federal, State, and local environmental review programs that do, or may, apply to the No Action Alternative, Alternative 1, and Alternative 2. Project facilities and activities will be implemented in accordance with applicable Federal laws and regulations and with State and local laws, regulations, programs, plans, and policies as applicable.

This Environmental Impact Statement (EIS)/Overseas EIS (OEIS) has been prepared and provided for public review in accordance with the Council on Environmental Quality regulations implementing the National Environmental Policy Act (NEPA) (40 Code of Federal Regulations [CFR] Part 1500-1508) and Presidential Executive Order (EO) 12114, *Environmental Effects Abroad of Major Federal Actions*.

In 1969, Congress enacted the NEPA, which provides for the consideration of environmental issues in federal agency planning and decision making. Regulations for federal agency implementation of the act were established by the President's CEQ. NEPA requires that federal agencies prepare an EIS for proposed actions with the potential to significantly affect the quality of human and natural environments. The EIS must disclose significant environmental impacts and inform decision makers and the public of the reasonable alternatives to the proposed action. Impacts to ocean areas of the Jacksonville (JAX) Study Area that lie within 22.2 kilometer (km) (12 nautical miles [nm]) of land (U.S. territory) are subject to analysis under NEPA. This is based on Presidential Proclamation 5928, issued December 27, 1988, in which the United States extended its exercise of sovereignty and jurisdiction under international law to 22.2 km (12 nm) from land. The Proclamation expressly provides that it does not extend or otherwise alter existing federal law or any associated jurisdiction, rights, legal interests, or obligations.

EO 12114 directs federal agencies to provide for informed decision making for major federal actions outside the United States, including the global commons, the environment of a non-participating foreign nation, or impacts on protect global resources. An Overseas EIS (OEIS) is required when an action has the potential to significantly harm the environment of the global commons. "Global commons" are defined as "geographical areas that are outside of the jurisdiction of any nation, and include the oceans outside the territorial limits (outside 22.2 km [12 nm] from the coast) and Antarctica. Global commons do not include contiguous zones and fisheries zones of foreign nations" (32 CFR 187.3). The Navy has published procedures for implementing EO 12114 in 32 CFR 187, Environmental Effects Abroad of Major Department of Defense Action, as well as the October 2007 Office of the Chief of Naval Operations Instruction (OPNAVINST) 5090.1C.

Unlike NEPA, EO 12114 does not require a scoping process. However, the EIS and OEIS have been combined into one document, as permitted under NEPA and EO 12114, in order to reduce duplication. Therefore the scoping requirements found in NEPA were implemented with respect to action occurring seaward of U.S. territorial waters (referred to in this EIS/OEIS as "U.S. territory"), and discussions regarding scoping requirements will reference the combined JAX EIS/OEIS. See section 1.5 for additional information regarding the Scope and Content of this EIS/OEIS and Section 1.6 for a detailed discussion of the environmental review process (to include scoping actions taken for this EIS/OEIS).

K.1 Bathymetry and Soils

Section 3.1 of this EIS/OEIS was prepared in accordance with the National Environmental Policy Act (NEPA) and Executive Order (EO) 12114, *Environmental Effects Abroad of Major Federal Actions,* as described in Chapter 1. States' jurisdictional boundaries extend 3 nm offshore of the coast. Impacts of operations evaluated under NEPA are further distinguished by State regulatory authorities where applicable. In addition, EO 13089, *Coral Reef Protection*, was issued on June 11, 1998, "to preserve and protect the biodiversity, health, heritage, and social and economic value of U.S. coral reef ecosystems and the marine environment." Another regulation protecting the underwater environment is the Marine Protection, Research, and Sanctuaries Act, which was enacted in 1972 by Congress. This Act prohibits dumping material into the ocean that would unreasonably degrade or endanger human health or the marine environment. Where dredging and ocean dumping of the dredged materials occur, a permit must be issued by the U.S. Corp of Engineers (USACE), which is subject to U.S. Environmental Protection Agency's (USEPA) approval.

K.2 Hazardous Materials and Hazardous Waste

Resource Conservation and Recovery Act (RCRA): 42 USC § 6901 *et seq*. regulates management of solid waste and hazardous waste. The Military Munitions Rule clarifies when conventional and chemical military munitions become a hazardous waste under RCRA. RCRA provides that the United States Environmental Protection Agency (USEPA) may delegate authority to states to regulate hazardous waste under state law in lieu of RCRA. Regardless of USEPA-delegated hazardous waste authority, Navy facilities need to meet state hazardous waste substantive and procedural requirements under the Federal Facilities Compliance Act. These include the requirement to obtain state permits for hazardous waste management and disposal.

Military munitions are not considered hazardous waste under two conditions stated in the USEPA Military Munitions Rule and the Department of Defense (DoD) Interim Policy on Military Munitions (1997). Specifically, munitions are not considered hazardous waste when:

1) Used for their intended purpose, including training of military personnel and explosive emergency response specialists, research and development activities, and when recovered, collected, and destroyed during range clearance events.

2) Unused and being repaired, reused, recycled, reclaimed, disassembled, reconfigured, or subjected to other material recovery activities.

These two conditions cover virtually all the uses of missiles, munitions, and targets at the VACAPES Range Complex.

Statutory hazardous waste authorities for the four states within the VACAPES Range Complex are contained in the following agencies and regulations (DoN, 2006).

In **Maryland**, hazardous waste management is regulated by the Maryland Department of the Environment (MDE). Maryland's hazardous waste management rules include the federal RCRA rules and several more stringent state requirements. Maryland has a State Hazardous Substance Response Plan, which is consistent with the National Contingency Plan and Maryland Superfund statute. The Controlled Hazardous Substance Advisory Council advises and assists the MDE. Regulations for hazardous waste are in Code of Maryland Regulations (COMAR) 26.13. Maryland's hazardous waste management rules include the federal RCRA rules and several more stringent state requirements.

Virginia Department of Environmental Quality (DEQ) has the authority to administer and enforce the state's hazardous waste management rules. DEQ's Division of Waste Program Coordination oversees the state rules on hazardous waste generator; transporter; and treatment, storage, and disposal facility (TSDF) law and 9 Virginia Administrative Code (VAC) rules. Hazardous waste rules are included in the Virginia Waste Management Act, VAC 10.1-1400, and 9 VAC 11, 20-60. Three regulatory boards, composed of Virginia citizens appointed by the governor, are responsible for adopting Virginia's environmental regulations. One of these, the Waste Management Board, has statutory authority to promulgate regulations and approve certain permits.

As to releases of toxic substances, Virginia has an Emergency Response Council (VERC), which is a policy and rule-making body, while DEQ administers the Superfund Amendments and Reauthorization Act (SARA) Title III program, also known as the Emergency Planning and Community Right-to-Know Act (EPCRA) program. VERC appointed members to 111 Local Emergency Planning Committees who serve as contacts for emergency notification in the event of a release or spill. The Virginia SARA program is strictly a federal program.

In **North Carolina**, the Division of Waste Management – Hazardous Waste Section (a division of the Department of Environment and Natural Resources [DENR]) oversees the hazardous waste management rules, which include RCRA and state requirements. Several state rules, such as the hazardous waste generator classifications, are stricter than the federal rules. Hazardous waste generators, owners, and operators of TSDFs must pay an annual fee to DENR, based on the amount of waste generated or managed. North Carolina also has additional hazardous waste storage and generator reporting requirements. Hazardous waste laws and rules are in North Carolina General Statutes 130A-290 to 130A-309 and 15A North Carolina Administrative Code (NCAC) 13A.0101 to 15A NCAC 13A.0119. According to the 2002 North Carolina state Hazardous Waste Management Plan, North Carolina has an established Hazardous Waste Emergency Response Fund, but it is in need of a reliable funding source. When funds are depleted, the state will no longer be able to respond to emergency spill situations.

The **Delaware** Department of Natural Resources and Environmental Control (DNREC), Division of Air and Waste Management (DAWM), plans and responds to environmental incidents, regulates the handling, transfer, storage, and disposal of solid, infectious and hazardous waste, regulates above and underground storage tanks and boilers, oversees the remediation of sites contaminated by hazardous chemicals, and enforces Delaware's environmental laws and regulations. Hazardous waste laws and rules are found online at http://regulations.delaware.gov/AdminCode and include the following: Delaware's Administrative Code, Title 7 – DNREC, 1000 – Division of Air and Waste Management, 1300 – Waste Management Section, Regulations Governing Hazardous Waste – 1302, Part 122, The Hazardous Waste Permit Program; Part 124, Procedures for Decision Making; Part 260, Hazardous Waste Management System: General; Part 261, Identification and Listing of Hazardous Waste; Part 262, Standards Applicable to Generators of Hazardous Waste; Part 263, Standards Applicable to Transporters of Hazardous Waste; Part 264, Standards For Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities; Part 265, Interim Status Standards For Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities; Part 266, Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities; Part 268, Land Disposal Restrictions; and Part 273, Standards for Universal Waste Management.

Petroleum, Oils, and Lubricants Management

The Oil Pollution Act of 1990 preserves state authority to establish laws governing oil spill prevention, response, and periodic drills and exercises. DoD facilities, including Navy facilities, are subject to state and local facility prevention and response planning requirements. However, Navy Shipboard Spill Contingency Plans (SCP) are not subject to state regulations. Commands may, however, provide courtesy copies of SCPs to state regulators to promote strong, cooperative relationships with the local community.

Statutory petroleum, oils, and lubricants (POL) management authorities for the four states within the VACAPES Range Complex are contained in the following agencies and regulations (DoN, 2006).

In **Maryland**, the Secretary of the MDE has the authority and responsibility for approving the use of chemical countermeasures for controlling oil spills in or affecting Maryland waters. The Oil Control Program within the Waste Management Administration of the MDE regulates all oil-related activities, such as aboveground and underground oil storage facilities, oil-contaminated soil treatment facilities, and oil transportation. According to COMAR 26.10.01.03, anyone discharging or allowing the discharge of oil is to report the incident immediately to the Waste Management Administration. Maryland's Oil Operations Permits are run according to Environment Article - §4-405, Annotated Code of Maryland; COMAR 26.08.01 - .04; COMAR 26.08.08; COMAR 26.08.07; COMAR 26.10.01.07; COMAR 26.10.01.06; and COMAR 26.10.13.

The **Virginia** Secretary of Natural Resources (VASNR) has the authority and responsibility for providing approval for the use of chemical countermeasures for controlling oil spills in or affecting Virginia waters. The Water Control Board promulgates Virginia's regulations covering petroleum storage tanks. The regulations for "Facility and Above-Ground Storage Tank Regulation," are found at 9VAC25-91-10. According to General Statute 143-215.85, notice of a discharge of petroleum or any other substance into the environment from underground storage tanks (UST) must be reported to Virginia DEQ, Water Division, Office of Spill Response and Remediation. Information needed to report a discharge includes the nature of the spill, location/time of the discharge, and the measures being taken or are proposed to contain and remove the spill.

The **North Carolina** Oil Pollution and Hazardous Substances Control Act of 1978 (Article 21A. Part 1. General Provisions. § 143-215.75) created the Oil Pollution Control Program. North Carolina General Statute 143-215.94 allows cleanup costs to be imposed on those having control over the oil or other hazardous substances or causing or contributing to the discharge of oil or other hazardous substances. 15A 1 NCAC .0118 covers the standards for the management of used oil and 2 15A NCAC 0106 identifies hazardous waste.

Delaware Administrative Code, Title 7, Division 1000, Regulations 1302, Part 279 *Standards for the Management of Used Oil* indicates that used oil from normal shipboard operations is considered to be generated at the time it is transported ashore. The owner or operator of the vessel and the person(s) removing or accepting used oil from the vessel are co-generators of the used oil and are both responsible for managing the waste in compliance with Part 279 once the used oil is transported ashore. The co-generators may decide between them which party will fulfill the requirements. Delaware Administrative Code is found online at http://regulations.delaware.gov/AdminCode.

K.3 Water Resources

Federal Regulations

Water resource regulations focus on the right to use water and the protection of water quality. The principal federal laws on protection of water quality are the Clean Water Act (CWA) (33 USC §1251, *et seq*.), the Rivers and Harbors Act (33 USC §401), and the Safe Drinking Water Act (SDWA) (42 USC §300f, *et seq*.). The CWA addresses surface water quality and preservation of wetlands. The Rivers and Harbors Act controls the construction of structures and the discharge of fill into navigable waters of the United States. The SDWA addresses protection of drinking water supplies. The USEPA enforces both the CWA and the SDWA. Section 403 of the CWA provides for the protection of ocean waters (waters of the territorial seas, the contiguous zone, and the high seas beyond the contiguous zone) from point-source discharges. Under Section 403(a), USEPA or an authorized state may issue a permit for an ocean

discharge only if the discharge complies with CWA guidelines for protection of marine waters. Under the CWA, territorial sea jurisdiction is defined as 3 nm from the coastal baseline [33 USC §1362 (8)].

The National Oceanic and Atmospheric Administration (NOAA) is also responsible for ocean water quality. NOAA is a trustee agency for coastal and marine resources under CWA, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as Superfund, the Coastal Zone Management Act (CZMA), and the Oil and Pollution Act (OPA). NOAA has established programs to monitor coastal environmental quality, protect marine habitat, and restore natural resources.

The CWA was amended in 1996 to authorize the DoD and USEPA to jointly establish Uniform National Discharge Standards (UNDS) for incidental liquid discharges from Armed Forces vessels. USEPA published final rules for Phase 1 of the UNDS program. In those rules, USEPA and the Navy identified which discharges will require control standards and a marine pollution control device (MPCD). The rules also identify the mechanism by which states can petition USEPA and DoD to review whether or not a discharge should require control by an MPCD, or to review a federal performance standard for an MPCD. Finally, the rules establish the processes USEPA and the states must follow to establish no-discharge zones, where any release of a specified discharge is prohibited.

According to the OPNAVINST 5090.1B, Chapter 7, as required by EO 12088, *Federal Compliance with Pollution Control Standards*, and the CWA, Navy facilities will comply with all substantive and procedural requirements applicable to point and non-point sources of pollution.

The CWA §402(p) establishes a framework for regulating storm water discharges under the National Pollution Discharge Elimination System (NPDES) program. 40 CFR Parts 122-125 set forth the NPDES regulations. Discharges of pollutants into waters of the United States are prohibited unless in compliance with an NPDES permit. The NPDES regulations allow authorized states to administer the NPDES program.

The CWA requires each state to establish water quality standards for its surface waters based on designated uses. For "impaired" water bodies, each state is supposed to develop total maximum daily loads (TMDL), which are the amount of pollutants that can be assimilated by a body of water without exceeding the water quality standards (WQS). Based on the developed TMDLs, the state or USEPA can limit any discharge of pollutants to a level sufficient to ensure compliance with state WQSs.

The TMDL program requires that states:

- Establish WQSs for its waters.
- Monitor the conditions of its waters.
- List waterbodies that do not meet WQSs with technology-based controls alone (303(d) list).
- Set priority rankings for the waterbodies listed.
- Establish TMDLs that meet WQSs for each listed waterbody.
- Solicit public comment.
- Submit 303(d) list and TMDLs to USEPA for approval.
- Incorporate TMDLs into the State's Continuing Planning Process.

Statutory Regulations

To receive USEPA approval, each state's WQSs must include an anti-degradation statement and policy. The policy is intended to maintain existing uses and the level of water quality necessary to protect those uses. Under certain circumstances high quality waters may have their quality lowered, but their uses must still be protected and the public must be informed and involved in the decision to allow the quality to be lowered.

Statutory water quality authorities for the four states adjacent to the VACAPES Range Complex are contained in the following agencies and regulations.

Delaware

Regulations governing water resources in Delaware can be found in the Delaware Administrative Code, Title 7, Section 7000 – Division of Water Resources, which includes regulations governing the control of water pollution (7200), watershed assessment (7400), and wetlands and subaqueous lands (7500).

The Delaware Department of Natural Resources and Environmental Control (DNREC) is the agency responsible for protecting and managing the state's natural resources and protection of public health and safety and the Division of Water Resources is responsible for enforcing the state's drinking water regulations, standards of the Delaware Public Water Supply Law, and the SDWA. The DNREC Division of Water Resources and the Water Control Boards are also key players in Delaware's water resource policies.

The Federal CWA provides the statutory basis for state water quality standards programs. The regulatory requirements governing these programs (Water Quality Standards Regulation) are published in 40 CFR 131. States are responsible for reviewing, establishing, and revising water quality standards. Delaware's surface water quality standards system is published in F.A.C. 62-302 (and 62-302.530). The components of this system include: classifications, criteria, an anti-degradation policy, and special protection of certain waters (Waters of Exceptional or Recreational Significance).

Designated uses are the water uses specified in water quality standards for each water body. The CWA requires that the uses are to be achieved and protected, even if they are not currently being attained. A water body can have more than one designated use. Current designated uses in Delaware include the following nine categories (DNREC, 2004 – State of Delaware Surface Water Quality Standards):

- **Public Water Supply -** Any waters of the State designated as public water supply.
- **Industrial Water Supply -** Any water protected for use for industrial purposes, including non-contact cooling water.
- **Primary Contact Recreation (Swimming) -** Any water-based form of recreation, the practice of which has a high probability for total body immersion or ingestion of water (examples include but are not limited to swimming and water skiing).
- **Secondary Contact Recreation (Wading) -** A water-based form of recreation, the practice of which has a low probability for total body immersion or ingestion of water (examples include but are not limited to wading, boating, and fishing).
- **Fish, Aquatic Life and Wildlife -** All animal and plant life found in Delaware, either indigenous or migratory, regardless of life stage or economic importance.
- **Cold Water Fish -** Protection of fish species (such as from the family Salmonidae) and other flora and fauna indigenous to a cold water habitat.
- **Agricultural Water Supply -** The use of land and water in the production of food, fiber, and timber products.
- **Waters of Exceptional Recreational or Ecological Significance -** Waters important, unique, or sensitive from a recreational and/or ecological perspective, but that may or may not have excellent water quality. Such waters shall normally have regional significance with respect to recreational use (fishing, swimming, and boating), or have significant or widespread riverine, riparian, or wetland natural areas.
- **Harvestable Shellfish Waters -** Waters from which shellfish may be taken and consumed; such waters are approved for shellfish harvesting by the State Board of Health.

Water quality criteria are designed to ensure the achievement of the designated uses assigned to each water body or segment. The criteria are expressed as concentrations, parameter levels or as narrative statements. It is assumed if criteria are met, designated uses will be protected.

The CZMA creates a federal-state partnership to keep pace with the challenges of increasing economic and recreational activity along coastlines in the United States. The Delaware Coastal Programs, comprising the Coastal Management Program and the National Estuarine Research Reserve, help meet this challenge.

Delaware's Coastal Management Program was approved by NOAA in 1979. The Coastal Program's lead agency is the Division of Soil and Water Conservation, Department of Natural Resources and Environmental Control. As a networked program, it is administered through a number of agencies, including Divisions of Water Resources, Fish and Wildlife, Parks and Recreation, Air and Waste Management, and DNREC's Office of the Secretary (NOAA, 2007a).

Due to its small size, the whole State of Delaware is considered coastal; however, the coastal zone is divided into two tiers, the "coastal strip" and the rest of the state. The coastal strip, averaging 4 miles wide, receives special zoning protection from industrial development, while the second tier only falls under general program provisions. The Coastal Program manages the coastal zone and resolves conflicts related to coastal zone issues. The program's mission is to "Preserve, protect, develop and where possible restore and enhance the resources of Delaware's coastal zone." (NOAA, 2007a). The Delaware National Estuarine Research Reserve encompasses 4,930 acres. The Reserve, approved in 1993 and administered by DNREC as part of the Coastal Program, is divided into Blackbird Creek and the Saint Jones Reserve. Salt marsh and open water habitats dominate the area of Saint Jones, while freshwater wetlands, ponds, and forest lands dominate the Blackbird Creek area. The Reserve's staff organizes an array of education and outreach projects for the general public, school groups, private and nonprofit organizations, educators, and coastal decision makers (NOAA, 2007a).

Maryland

Regulations governing water quality in Maryland are found in the Code of Maryland Regulations (COMAR), Title 26, Department of the Environment Subtitle 8, Chapter 2 (26.08.02). These regulations include provisions addressing surface water quality protection, designated uses, surface water quality criteria, toxic substance water quality control for surface water, numerical criteria for toxic substances, water quality criteria specific to designated uses, anti-degradation policy, mixing zones, intermittent streams, surface water use designations, and stream segment definitions (COMAR, 2007).

Current designated uses in the State of Maryland include the following eight categories:

- **Use I:** Water Contact Recreation, and Protection of Nontidal Warmwater Aquatic Life
- **Use I-P:** Water Contact Recreation, Protection of Aquatic Life, and Public Water Supply
- **Use II:** Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting
  - Shellfish Harvesting Subcategory
  - Seasonal Migratory Fish Spawning and Nursery Subcategory (Chesapeake Bay only)
  - Seasonal Shallow-Water Submerged Aquatic Vegetation Subcategory (Chesapeake Bay only)
  - Open-Water Fish and Shellfish Subcategory (Chesapeake Bay only)
  - Seasonal Deep-Water Fish and Shellfish Subcategory (Chesapeake Bay only)
  - Seasonal Deep-Channel Refuge Use (Chesapeake Bay only)
- **Use II-P:** Tidal Fresh Water Estuary – includes applicable Use II and Public Water Supply
- **Use III:** Nontidal Cold Water
- **Use III-P:** Nontidal Cold Water and Public Water Supply
- **Use IV:** Recreational Trout Waters
- **Use IV-P:** Recreational Trout Waters and Public Water Supply

Maryland Department of the Environment (MDE) is responsible for protecting and restoring the quality of Maryland's air, water, and land resources, while fostering smart growth, economic development, healthy and safe communities, and quality environmental education for the benefit of the environment, public health, and future generations. The Water Management Administration (WMA) in the MDE is responsible for assuring the state's waters are safe for drinking, recreation, and wildlife. The Environmental Permits Service Center, part of the MDE, provides assistance to those seeking permits (DoN, 2006a).

Maryland has a robust storm water management program. The regulations governing Maryland's storm water management program may be found in COMAR 26.17.02. The Water Quality Infrastructure Program (WQIP) manages federal capital funds consisting of USEPA construction grants, special federal appropriations grants, and State revolving loan funds for water quality and drinking water projects. The Program manages State grant programs of $18-20 million annually, including the following categories: Special Water Quality/Health, Small Creeks and Estuaries Restoration, Storm water Pollution Control, Biological Nutrient Removal, and Water Supply Financial Assistance. The State matches funds for federal grants.

Maryland's Coastal Program was established through Executive Order and approved by NOAA in 1978. The Coastal Program is a networked program composed of several state planning and regulatory programs, as well as the Chesapeake and Coastal Bays Critical Areas Protection Program. The Department of Natural Resources is the lead agency. Maryland's coastal boundary follows the inland boundary of the counties (and Baltimore City) bordering the Atlantic Ocean, Chesapeake Bay, and the Potomac River (as far as the municipal limits of Washington, D.C.) (NOAA, 2007b).

The Coastal Program addresses a variety of coastal issues including provision of public access, nonpoint source pollution reduction, coastal hazards mitigation, habitat and living resources protection, and growth management. The Coastal Program also supports local governments through development of Watershed Restoration Action Strategies, which help focus federal, state, local, and private resources on the areas most in need of restoration (NOAA, 2007b).

The Chesapeake Bay National Estuarine Research Reserve covers 4,820 acres and is part of the largest estuary in the United States and one of the most productive bodies of water in the world. The Reserve encompasses a diversity of ecosystem habitats, including salt marsh, freshwater marsh, and a tidal and riverine system (NOAA, 2007b).

Virginia

Information on Virginia State Water Quality can be found in Virginia Administrative Code (VAC) Title 9 (Environment), Agency 25 (State Water Control Board), Chapter 260 (Water Quality Standards), or 9 VAC 25-260. 9 VAC 25, Chapter 220 includes regulations pertaining to surface water management areas, and 9 VAC 25, Chapter 40 includes regulations for nutrient-enriched waters and dischargers within the Chesapeake Bay watershed (VAC, 2007).

The Virginia Department of Environmental Quality (VA DEQ) administers the Federal CWA and enforces state laws to improve the quality of Virginia's streams, rivers, bays, and groundwater for aquatic life, human health, and other water uses. The Virginia Department of Health's Office of Drinking Water enforces the state's drinking water regulations, standards of the Virginia Public Water Supply Law, and the Federal SDWA. The VA DEQ Water Division and the Virginia Water Control Board also are key players in Virginia's water resource policies.

In the State of Virginia, all State waters, including wetlands, are designated for the following uses (Virginia State Water Control Board, 2006):

- **Recreational uses** – *e.g*., swimming and boating;
- **The propagation and growth of a balanced, indigenous population of aquatic life, including game fish, which might reasonably be expected to inhabit them** –
  - **Migratory Fish Spawning and Nursery Designated Use** – waters in the Chesapeake Bay and its tidal tributaries that protect the survival, growth, and propagation of the early life stages of a balanced, indigenous population of fish species inhabiting spawning and nursery grounds (see boundaries in USEPA, 2004, *Technical Support Document for Identification of Chesapeake Bay Designated Uses and Attainability 2004 Addendum.* Chesapeake Bay Program Office, Annapolis, Maryland). This designated use extends horizontally from the shoreline of the body of water to the adjacent shoreline, and extends down through the water column to the bottom water sediment interface.
  - **Shallow-Water Submerged Aquatic Vegetation Designated Use –** waters in the Chesapeake Bay and its tidal tributaries that support the survival, growth and propagation of submerged aquatic vegetation (rooted, underwater bay grasses).
  - **Open-Water Aquatic Life Designated Use: waters in the Chesapeake Bay and it's tidal tributaries that protect the survival, growth and propagation of a balanced, indigenous population of aquatic life inhabiting open-water habitats –** this designated use applies year-round but the vertical boundaries change seasonally (see boundaries in USEPA, 2004, *Technical Support Document for Identification of Chesapeake Bay Designated Uses and Attainability 2004 Addendum.* Chesapeake Bay Program Office, Annapolis, Maryland). This designated use includes the migratory fish spawning and nursery and shallow-water submerged aquatic vegetation uses.
  - **Deep-Water Aquatic Life Designated Use: waters in the Chesapeake Bay and its tidal tributaries that protect the survival and growth of a balanced, indigenous population of aquatic life inhabiting deep-water habitats –** this designated use extends to specific tidally influenced waters (see boundaries in USEPA, 2004, *Technical Support Document for Identification of Chesapeake Bay Designated Uses and Attainability 2004 Addendum.* Chesapeake Bay Program Office, Annapolis, Maryland). This use applies June 1 through September 30.
  - **Deep-Channel Seasonal Refuge Designated Use –** waters in the Chesapeake Bay and its tidal tributaries that protect the survival of a balanced, indigenous population of benthic fauna inhabiting deep-channel habitats. This designated use extends to the tidally influenced waters at specific depths (see boundaries in USEPA, 2004, *Technical Support Document for Identification of Chesapeake Bay Designated Uses and Attainability 2004 Addendum.* Chesapeake Bay Program Office, Annapolis, Maryland). This use applies June 1 through September 30.
- Wildlife; and
- The production of edible and marketable natural resources, *e.g.,* fish and shellfish

In 1997 the Virginia legislature passed the Water Quality Improvement Act and the Water Quality Monitoring, Information, and Restoration Act (WQMIRA). These two laws mandated the Commonwealth to assess and report on the impacts of nonpoint sources and the implementation and effectiveness of state nonpoint source programs leading to improvements in water quality. In particular, the WQMIRA established state monitoring and reporting requirements.

The Virginia Coastal Zone Management Program was approved by NOAA in 1986 and is composed of a network of agencies with authority in the state's coastal zone. The VA DEQ serves as the lead agency. Virginia's coastal zone includes the state's 29 coastal counties and encompasses salt marshes, wetlands, beaches, transition and inter-tidal areas, and islands (NOAA, 2007c).

The Coastal Program's goals include protecting coastal resources, air and water quality, preventing the loss of coastal habitat and loss of life and property from coastal hazards, providing for sustainable wild fisheries and aquaculture, promoting renewable energy, and improving public access.

North Carolina

According to North Carolina General Statute (NCGS) 130A Article 10, the Public Water Supply Section of the North Carolina Department of Environment and Natural Resources (DENR) is responsible for the state's safe drinking water. The DENR also administers two major storm water permitting programs. The North Carolina Division of Water Quality (DWQ) is the agency responsible for statewide regulatory programs in ground water and surface water protection.

Current designated uses in the State of North Carolina include the following categories (NC DENR/DWQ, 2007a):

Freshwater shall be assigned to one of the following classification:

- **Class C** – freshwater protected for secondary recreation, fishing, and aquatic life, including propagation and survival, and wildlife. All freshwater shall be classified to protect these uses at a minimum.
- **Class B** – freshwater protected for primary recreation that includes swimming on a frequent or organized basis and all Class C uses.
- **Class WS-I** – waters protected as water supplies that are essentially in natural and undeveloped watersheds. Point source discharges of treated wastewater are permitted pursuant to Rules .0104 and .0211 of this section. Local programs to control nonpoint sources and storm water discharges of pollution are required. Suitable for all Class C uses.
- **Class WS-II** – waters protected as water supplies that are generally in predominantly undeveloped watersheds. Point source discharges of treated wastewater are permitted pursuant to Rules .0104 and .0211 of this section. Local programs to control nonpoint sources and storm water discharges of pollution shall be required. Suitable for all Class C uses.
- **Class WS-III** – waters protected as water supplies that are generally in low to moderately developed watersheds. Point source discharges of treated wastewater are permitted pursuant to Rules .0104 and .0211 of this section. Local programs to control nonpoint sources and storm water discharges of pollution shall be required. Suitable for all Class C uses.
- **Class WS-IV** – waters protected as water supplies that are generally in moderately to highly developed watersheds. Point source discharges of treated wastewater are permitted pursuant to Rules .0104 and .0211 of this section. Local programs to control nonpoint sources and storm water discharges of pollution shall be required; suitable for all Class C uses.
- **Class WS-V** – waters protected as water supplies that are generally upstream of and draining to Class WSIV waters. No categorical restrictions on watershed development or treated wastewater discharges shall be required. However, the Commission or its designee may apply appropriate management requirements as deemed necessary for the protection of downstream receiving waters (15A NCAC 2B .0203); suitable for all Class C uses.
- **Class WL** – waters that meet the definition of wetlands found in 15A NCAC 2B .0202 except those designated as Class SWL.

Tidal Salt Waters shall be assigned to one of the following:

- **Class SC** – saltwaters protected for secondary recreation, fishing, and aquatic life, including propagation and survival, and wildlife. All saltwaters shall be classified to protect these uses at a minimum.
- C**lass SB** – saltwaters protected for primary recreation that includes swimming on a frequent or organized basis and all Class SC uses.
- **Class SA** – suitable for commercial shellfishing and all other tidal saltwater uses.

- **Class SWL** – waters that meet the definition of coastal wetlands as defined by 15A NCAC 2H .0205, and which are landward of the mean high water line, and wetlands contiguous to estuarine waters as defined by 15A NCAC 2H .0206.

The following are supplemental classifications:

- **Trout waters (Tr)** – freshwaters protected for natural trout propagation and survival of stocked trout.
- **Swamp waters (Sw)** – waters that have low velocities and other natural characteristics different from adjacent streams.
- **Nutrient Sensitive Waters (NSW)** – waters subject to growths of microscopic or macroscopic vegetation requiring limitations on nutrient inputs.
- **Outstanding Resource Waters (ORW)** – unique and special waters of exceptional state or national recreational or ecological significance that require special protection to maintain existing uses.
- **High Quality Waters (HQW)** – waters that are rated as excellent based on biological and physical/chemical characteristics through Division monitoring or special studies, native and special native trout waters (and their tributaries) designated by the Wildlife Resources Commission, primary nursery areas (PNA) designated by the Marine Fisheries Commission and other functional nursery areas designated by the Marine Fisheries Commission, all water supply watersheds either classified as WS-I or WS-II or those for which a formal petition for reclassification as WS-I or WS-II was received from the appropriate local government and accepted by the Division of Water Quality and all Class SA waters.
- **Future Water Supply (FWS)** – waters requested by a local government and adopted by the Commission as a future source for drinking, culinary, or food-processing purposes. The requirements for FWS may also be applied to waters formerly used for drinking water supply use, and currently classified for water supply use, at the request of local government(s) desiring protection of the watershed for future water supply use.
- **Unique wetlands (UWL)** – wetlands of exceptional state or national ecological significance that require special protection to maintain existing uses. These wetlands may include wetlands documented to the satisfaction of the Commission as habitat essential for the conservation of state or federally listed threatened or endangered species.

DENR's 1998 Compliance and Enforcement Policy for water quality strengthens enforcement and heightens compliance with state and federal water regulations. The policy calls for increased penalties for significant violators, delegated enforcement authority to regional officers, and a new penalty protocol for discharges from sewer collection systems. Pollution prevention (P2) is the preferred approach for achieving environmental protection, and the state has developed recognition and incentive programs that encourage facilities to go "beyond compliance."

The Coastal Resources Commission (CRC) was created when the General Assembly adopted the Coastal Area Management Act (CAMA) in 1974. The CRC establishes policies for the North Carolina Coastal Management Program and adopts implementing rules for both CAMA and the North Carolina Dredge and Fill Act. The commission designates areas of environmental concern, adopts rules and policies for coastal development within those areas, and certifies local land-use plans.

The North Carolina Coastal Management Program was approved by NOAA in 1981. The lead agency is the Division of Coastal Management within the DENR that implements and supervises all the various Coastal Zone Management programs in the state. North Carolina's coastal zone includes 20 coastal counties that in whole or in part are adjacent to, adjoining, intersected, or bounded by the Atlantic Ocean or any coastal sound (NOAA, 2007d).

Some of the greatest challenges facing North Carolina's coastal zone are impacts from population growth and coastal development, including loss of sensitive coastal habitats and increased risks to life and

property from coastal hazards. The Coastal Program is designed to address these issues, along with others, such as public access to beaches and other shore fronts, conservation and restoration of wetlands, and management of beach erosion (NOAA, 2007d).

The North Carolina National Estuarine Research Reserve includes Corolla (Currituck Banks), Beaufort (Rachel Carson), and Wilmington (Masonboro Island and Zeke's Island). The estuarine system is the fourth largest in the nation and encompasses about two million acres (NOAA, 2007d).

K.4 Air Quality

Federal Air Quality Requirements

The USEPA is the agency responsible for enforcing the federal Clean Air Act (CAA) of 1970 and its 1977 and 1990 amendments (42 USC §7401, *et seq*.). The purpose of the CAA is to establish NAAQS, to classify areas as to their attainment status relative to the NAAQS, to develop schedules and strategies to meet the NAAQS, and to regulate emissions of criteria pollutants and air toxics to protect public health and welfare. Under the CAA, individual states are allowed to adopt ambient air quality standards and other regulations, provided they are at least as stringent as federal standards. The Clean Air Act Amendments (CAAA) (1990) established new deadlines for achievement of the NAAQS, dependent upon the severity of the nonattainment.

The USEPA requires each state to prepare a State Implementation Plan (SIP) that describes how that state will achieve compliance with the NAAQS. A SIP is a compilation of goals, strategies, schedules, and enforcement actions that will lead the state into compliance with all federal air quality standards. The predominant air quality regulations promulgated under the CAA potentially applicable to the proposed action include:

- National Ambient Air Quality Standards; and
- General Conformity Rule.

Implementation of the CAA is carried out through rules promulgated by the states through their respective agencies. For the proposed action, this includes, Delaware (Delaware Department of Natural Resources and Environmental Control [DNREC]); Maryland (Maryland Department of the Environment [MDE]); Virginia (Virginia Department of Environmental Quality [VDEQ]); and North Carolina (North Carolina Department of Environment and Natural Resources [NC DENR]).

NAAQS

The CAA requires the USEPA to set NAAQS (40 CFR Part 50) for pollutants considered harmful to public health and the environment (Table K-1). The CAA established two types of national air quality standards (primary and secondary). Primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

TABLE K-1

National Ambient Air Quality Standards

Pollutant	Primary Standards	Averaging Times	Secondary Standards
Carbon Monoxide	9 ppm (10 μg/m^3)	8-hour[1]	None
	35 ppm (40 μg/m^3)	1-hour[1]	None
Lead	1.5 μg/m^3	Quarterly Average	Same as Primary
Nitrogen Dioxide	0.053 ppm (100 μg/m^3)	Annual (Arithmetic Mean)	Same as Primary
Particulate Matter (PM_{10})	Revoked[2]	Annual[2] (Arithmetic Mean)	Same as Primary
	150 μg/m^3	24-hour[3]	Same as Primary
Particulate Matter ($PM_{2.5}$)	15.0 μg/m^3	Annual[4] (Arithmetic Mean)	Same as Primary
	35 μg/m^3	24-hour[5]	Same as Primary
Ozone	0.08 ppm	8-hour[6]	Same as Primary
	0.12 ppm	1-hour[7] (Applies only in limited areas)	Same as Primary
Sulfur Oxides	0.03 ppm	Annual (Arithmetic Mean)	None
	0.14 ppm	24-hour[1]	None
		3-hour[1]	0.5 ppm (1300 μg/m^3)

Source: USEPA, 2007a, Last updated March 2nd, 2007.

Notes:

1. Not to be exceeded more than once per year.
2. Due to lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM_{10} standard (effective December 17, 2006).
3. Not to be exceeded more than once per year on average over 3 years.
4. To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0μg/m^3.
5. To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35μg/m^3 (effective December 17, 2006).
6. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
7. (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤1, as determined by Appendix H. (b) As of June 15, 2005, USEPA revoked the 1-hour ozone standard in all areas, except the fourteen 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

General Conformity Rule

Section 176 I (1) of the CAA, commonly known as the General Conformity Rule (Conformity), requires federal agencies to assure that their actions conform to applicable implementation plans for achieving and maintaining the NAAQS for criteria pollutants. To ensure Conformity, a federal action must not contribute to new violations of ambient air quality standards, increase the frequency or severity of existing violations, or delay timely state and/or regional attainment of standards.

The USEPA rule implementing the conformity requirements, "Determining Conformity of General Federal Actions to State or Federal Implementation Plans," was published on 30 November 1993 at 58 FR 63214 and codified at 40 CFR Parts 51 and 93. Part 51, Subpart W, contains the General Conformity Rule

provisions that must be incorporated into SIPs, including the requirement that States revise the SIPs to include the conformity requirements. Once a SIP has been revised and approved by USEPA, the conformity requirements become federally enforceable and federal agencies are subject to the conformity requirements as they appear in the SIP. In cases where a Federal Implementation Plan (FIP) is in effect, federal actions must conform to the requirements of the FIP. Each federal agency taking an action subject to the General Conformity Rule must make its own conformity determination (40 CFR Part 93.154).

A Conformity Review must be completed for every Navy action that generates air emissions in non-attainment or maintenance (formerly non-attainment) areas. The action proponent is responsible for the documentation. The Conformity Review can be satisfied by (1) a determination that the action is not subject to the General Conformity Rule, (2) a Record of Non-Applicability, or (3) a Conformity Determination.

The action proponent may make a determination that the proposed action is not subject to the General Conformity Rule. Actions not subject to the rule are actions that occur in attainment areas, and that do not generate emissions in non-attainment areas; or actions where the criteria pollutant (or its precursors) that is emitted is one for which the area is in attainment. If National Environmental Policy Act (NEPA) documentation is prepared for the action, the determination shall be described in that documentation; otherwise, no documentation is required. This Environmental Impact Statement (EIS)/Overseas EIS (OEIS) includes the determination that all actions occurring in the attainment areas (i.e., coastal counties of Maryland, Virginia and North Carolina) are not subject to the General Conformity Rule. Actions occurring adjacent to coastal Delaware counties are separately addressed in a Record of Non-Applicability.

State Air Quality Requirements

Delaware

The Delaware Department of Natural Resources and Environmental Control's Division of Air and Waste Management (DAWM) oversees and enforces Delaware's air pollution and control regulations. The DAWM, Air Quality Management Section is responsible for: i) monitoring and regulating all emissions to the air; ii) issuing "permits to construct" and "permits to operate" to air contaminant sources; iii) maintaining emission inventories from business and industry; iv) developing the State Implementation Plan as required by the CAA; v) adopting new regulations and enforce existing regulations and permits; and vi) inspecting asbestos removal sites (DNREC, 2007). Delaware's air program is shaped by its SIP found at 40 CFR Part 51 and Parts 52.420-52.424, Part 52.426, Part 52.430, Part 52.432, Part 52.433, Part 52.440, Part 52.441, Part 52.460, and Part 52.465.

Maryland

The Maryland Department of the Environment's (MDE) Air and Radiation Management Administration oversees and enforces Maryland's air pollution control regulations. Maryland's air program is shaped by its SIP found at 40 CFR Part 51 and 40 CFR Parts 52.1070 through 52.1118. To ensure the air is safe to breathe, the MDE carries out mandates from the federal CAA and administers air pollution monitoring, planning, and control programs to improve and maintain air quality. MDE also administers a radiation control program in conformance with federal law. The programs are geared to protect the health and welfare of both the citizens and the environment of Maryland (MDE, 2007a).

Virginia

The VDEQ, Division of Air Quality administers and enforces the state's air pollution regulations. Virginia's SIP details strategies for implementation, maintenance, and enforcement of the NAAQS. The NAAQS established by the Clean Air Act and implemented by USEPA in the Code of Federal

Regulations at 40 CFR Part 50 and incorporated into the Virginia regulations at 9 Virginia Administrative Code (VAC) 5 Chapter 30. Virginia's SIP was submitted to USEPA in early 1972. More than 100 revisions have been made to the Virginia SIP since its original submittal. The plan consists mostly of regulations, as well as permits, emissions inventories, attainment demonstrations, and other related documentation (VDEQ, 2007).

Aircraft are exempt from the DEQ regulations that govern emissions standards for mobile sources (9 VAC 5-40-5680).

North Carolina

The North Carolina Division of Air Quality is responsible for protecting and improving North Carolina's ambient air quality. North Carolina's air quality issues are governed by its SIP found in 40 CFR Part 51 and 40 CFR Parts 52.1770 through 52.1783. The NC DENR adopted the USEPA's NAAQS as the statewide ambient air quality standards. When the USEPA amended the standard for particulate matter, changing the regulated pollutant from total suspended particulates (TSP) to PM_{10} (PM_{10}: diameter $\leq$10 micrometers) that is inhalable, the NC DENR adopted the PM_{10} standard, but continued to use both PM_{10} and TSP as monitoring indicators for the level of particulate matter. Therefore, the North Carolina ambient air quality standards include all of the NAAQS, plus a standard for TSP.

K.5 Noise Environment

The Navy meets its noise management obligations at air-to-ground training ranges (*i.e.*, on-land targets) through the Range Air Installations Compatible Use Zone (RAICUZ) program found in OPNAV Instruction 3550.1A (DoN, 2008). RAICUZ Program implementation includes developing current and future Range Compatibility Zones (RCZ) and current and prospective noise analysis for the range, partnering with appropriate federal, state, and local government agencies (working with these agencies for compatible land use near and around the ranges), considering operational alternatives as necessary, implementing a complaint response program in the surrounding communities, and developing strategies to protect the long term viability of the range while maintaining a high degree of public safety (DoN, 2008). According to Appendix C of OPNAVINST 3550.1A, the only air-to-ground ranges within the VACAPES Range Complex, wherein the RAICUZ Program requirements must be implemented are R-5313 Stumpy Point Range and R-5314 Navy Dare County Range (DoN, 2008). However, because no air-to-ground training ranges are considered under this EIS/OEIS, the RAICUZ program is inapplicable here. All training spaces considered within this EIS/OEIS are over water and distant from any noise receptors.

The Department of Defense (DoD) has a similar program for air stations, called the Air Installation Compatibility Use Zone (AICUZ) program (DoN, 2002b). The foundation of the AICUZ program is an active local command effort to work with local, state, regional, other federal agencies, and community leaders to encourage compatible development of land adjacent to military airfields. The Navy is particularly susceptible to such encroachment with many of its installations located in high growth urban areas. The AICUZ process involves four basic steps:

1. Develop, and periodically update, a study for each air installation to quantify aircraft noise zones and identify accident potential zones; develop a noise reduction strategy for impacted lands, both on and off the installation; prepare a compatible land use plan for the installation and surrounding areas; and develop a strategy to promote compatible development on land within these areas.

2. Develop a prospective long-term (5 to 10 years) AICUZ analysis to illustrate impact on known future missions and how it will be implemented by the AICUZ program.

3. Implement the AICUZ plan for the installation including coordination with federal, state and local officials to maintain public awareness of AICUZ.

4. Identify and program property rights acquisition and sound suppression projects when appropriate in critical areas, where action to achieve compatibility within AICUZ program guidelines through local land use controls is either impossible or has been attempted and proven unsuccessful.

Although not within the boundaries of the VACAPES Range Complex, NAS Oceana is mentioned here due to its proximity to the Complex, and because the aircraft stationed there are the primary users of the range complex. The AICUZ program for NAS Oceana and NALF Fentress was first established by the Navy in 1978. This AICUZ was considered representative of operations at these facilities for over 20 years. In 1998, the Navy initiated a study to update the AICUZ based on operational changes that occurred with the realignment of the majority of the Hornet squadrons from NAS Cecil Field, FL to NAS Oceana in 1999.

Due to the possibility of mission changes at NAS Oceana and Chambers Field Naval Station, Norfolk, the formal approval of a new AICUZ was put on hold until the completion of the siting process for the MH-60 R/S helicopters and the Superhornet aircraft. However, the cities of Chesapeake and Virginia Beach adopted the noise contours as part of their comprehensive plans and zoning ordinances (DoN, 2003). Primary flight operations that occur at NAS Oceana are departures, straight-in full stop arrivals, overhead-break arrivals, carrier-break arrivals, touch-and go, Field Carrier Landing Practice (FCLP), and Ground Controlled Approaches (GCA). These operations form the basis for the noise contours and Accident Potential Zones (APZ).

An AICUZ Study was also performed for NS Norfolk (Chambers Field). The latest AICUZ was the adopted AICUZ map from 1979. This study is reflected in the Joint Land Use Study (JLUS) for Hampton Roads. The baseline noise contours for this area are depicted in Section 3.4.2.2.

K.6 Marine Communities

A community is an assemblage of plants and/or animal populations sharing a common environment and interacting with each other and with the physical environment. This section specifically addresses the following marine communities occurring within the VACAPES Range Complex: plankton and macroalgae, benthic communities, seagrasses/submerged aquatic vegetation, and artificial habitats. Marine mammals are addressed in Section 3.6, sea turtles are addressed in Section 3.7, fish and essential fish habitat are addressed in Section 3.8, and seabirds and migratory birds are addressed in Section 3.9 of this EIS/OEIS. Marine species listed under the Endangered Species Act (ESA) are addressed in Sections 3.6 through 3.9, as applicable. No National Marine Sanctuaries are located within the VACAPES Range Complex boundaries; therefore, they are not addressed in this EIS/OEIS.

The various federal laws and regulations that afford protection and management of marine communities are primarily aimed at specific community components such as ESA-listed species and designated critical habitat; marine mammals; federally managed fish species and essential fish habitat (EFH); and migratory birds. Regulatory frameworks for these marine community components are presented in Sections 3.6 through 3.9.

K.7 Marine Mammals

The Marine Mammal Protection Act (MMPA) of 1972 established, with limited exceptions, a moratorium on the "taking" of marine mammals in waters or on lands under U.S. jurisdiction. The act further regulates "takes" of marine mammals in the global commons (i.e., the high seas) by vessels or persons under U.S. jurisdiction. The term "take," as defined in Section 3 (16 USC 1362) of the MMPA, means "to

harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal." "Harassment" was further defined in the 1994 amendments to the MMPA, which provided two levels of "harassment," Level A (potential injury) and Level B (potential disturbance).

The National Defense Authorization Act (NDAA) of Fiscal Year (FY) 2004 (Public Law [PL] 108-136) amended the definition of harassment as applied to military readiness activities or scientific research activities conducted by or on behalf of the federal government, consistent with Section 104I(3) [16 USC 1374 I(3)]. The FY 2004 NDAA adopted the definition of "military readiness activity" as set forth in the FY 2003 NDAA (PL 107-314). Military training activities within the VACAPES Range Complex constitute military readiness activities as that term is defined in PL 107-314 because training activities constitute "training and operations of the Armed Forces that relate to combat" and constitute "adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use." For military readiness activities, the relevant definition of harassment is any act that:

- Injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild ("Level A harassment").
- Disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering to a point where such behavioral patterns are abandoned or significantly altered ("Level B harassment") [16 USC 1362 (18)(B)(i)(ii)].

Section 101(a)(5) of the MMPA directs the Secretary of the Department of Commerce to allow, upon request, the incidental (but not intentional) taking of marine mammals by U.S. citizens who engage in a specified activity (exclusive of commercial fishing), if certain findings are made and regulations are issued. Permission will be granted by the Secretary for the incidental take of marine mammals if the taking will have a negligible impact on the species or stock and will not have an unmitigable adverse impact on the availability of such species or stock for taking for subsistence uses.

Several species of marine mammals could potentially occur in the VACAPES Range Complex. Accordingly, the Navy initiated the MMPA compliance process by submitting a Letter of Authorization package to the NMFS on April 7, 2008.

Endangered Species Act

The Endangered Species Act (ESA) of 1973 established protection over and conservation of threatened and endangered species and the ecosystems upon which they depend. An "endangered" species is a species that is in danger of extinction throughout all or a significant portion of its range, while a "threatened" species is one that is likely to become endangered within the foreseeable future throughout all or in a significant portion of its range. The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) jointly administer the ESA and are also responsible for the listing of species (i.e., the labeling of a species as either threatened or endangered). The USFWS has primary management responsibility for management of terrestrial and freshwater species, while the NMFS has primary responsibility for marine species and anadromous fish species (species that migrate from saltwater to freshwater to spawn). The ESA allows the designation of geographic areas as critical habitat for threatened or endangered species.

The ESA requires federal agencies to conserve listed species and consult with the USFWS and/or NMFS to ensure that proposed actions that may affect listed species or critical habitat are consistent with the requirements of the ESA. The ESA specifically requires agencies not to "take" or "jeopardize the continued existence of" any endangered or threatened species, or to destroy or adversely modify habitat critical to any endangered or threatened species. Under Section 9 of the ESA, "take" means to harass,

harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect. Harm is further defined by FWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by FWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. [50 CFR §17.3] Under Section 7 of the ESA, "jeopardize the continued existence of" means to engage in any action that would be expected to reduce appreciably the likelihood of the survival and recovery of a listed species by reducing its reproduction, numbers, or distribution (50 CFR §402.02).

Six species of whales that are listed as endangered under the ESA could potentially occur in the VACAPES EIS/OEIS Study Area. Accordingly, the Navy initiated the ESA Section 7 consultation process with NMFS on April 7, 2008 and has prepared a Biological Evaluation (BE) to support the consultation process. The Navy initiated informal consultation on 12 May 2008 with USFWS for species under their jurisdiction. Critical habitat for listed species has not been designated under the ESA in the VACAPES Range Complex EIS/OEIS Study Area. Copies of correspondence with NMFS and USFWS are provided in Appendix A and C of this EIS/OEIS.

K.8 Sea Turtles

Endangered Species Act

As discussed in Section 3.6.1.1, the Endangered Species Act (ESA) established protection over and conservation of threatened and endangered species. All five species of sea turtles that potentially occur in the VACAPES Range Complex are listed as threatened or endangered. Therefore, the ESA requirements discussed in Section 3.6.1.1 are applicable to the analysis of sea turtles.

The Navy initiated the ESA Section 7 consultation process with the NMFS on April 7, 2008 and prepared a Biological Evaluation (BE) to support the consultation process. Critical habitat for listed species has not been designated under the ESA in the VACAPES Range Complex study area. Copies of correspondence with the NMFS are provided in Appendix C of this EIS/OEIS.

K.9 Fish and Essential Fish Habitat

Magnuson-Stevens Fishery Conservation and Management Act

The Fishery Conservation and Management Act of 1976, later changed to the Magnuson Fishery Conservation and Management Act in 1980, established a 200 nm fishery conservation zone in U.S. waters and a regional network of Fishery Management Councils. The Fishery Management Councils are composed of federal and state officials, including the U.S. Fish and Wildlife Service (USFWS), which oversee fishing activities within the fishery management zone. In 1996, the Magnuson Fishery Conservation and Management Act was reauthorized and amended as the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), known more popularly as the Sustainable Fisheries Act. The MSFCMA mandated numerous changes to the existing legislation designed to prevent overfishing, rebuild depleted fish stocks, minimize bycatch, enhance research, improve monitoring, and protect fish habitat.

One of the most significant mandates in the MSFCMA is the essential fish habitat (EFH) provision, which provides the means to conserve fish habitat. The EFH mandate requires that the regional Fishery Management Councils, through federal Fishery Management Plans (FMP), describe and identify EFH for each federally managed species, minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitats. Congress defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or

growth to maturity" (16 USC 1802[10]). The term "fish" is defined in the MSFCMA as "finfish, mollusks, crustaceans, and all other forms of marine animals and plant life other than marine mammals and birds." The regulations for implementing EFH clarify that "waters" include all aquatic areas and their biological, chemical, and physical properties, while "substrate" includes the associated biological communities that make these areas suitable fish habitats (CFR 50:600.10). Habitats used at any time during a species' life cycle (*i.e.,* during at least one of its life stages) must be accounted for when describing and identifying EFH. In addition to EFH designations, areas called habitat areas of particular concern (HAPC), which are a subset of designated EFH that is especially important ecologically to a species/life stage and/or is vulnerable to degradation, are also to be designated to provide additional focus for conservation efforts (50 CFR 600.805-600.815). Categorization as HAPC does not confer additional protection or restriction to designated areas.

Authority to implement the MSFCMA is given to the Secretary of Commerce through the National Marine Fisheries Service (NMFS). The MSFCMA requires that EFH be identified and described for each federally managed species. The NMFS and regional Fishery Management Councils determine the species distributions by life stage and characterize associated habitats, including HAPC. The MSFCMA requires federal agencies to consult with the NMFS on activities that may adversely affect EFH, or when the NMFS independently learns of a federal activity that may adversely affect EFH. The MSFCMA defines an adverse effect as "any impact which reduces quality and/or quantity of EFH [and] may include direct (*e.g.,* contamination or physical disruption), indirect (*e.g.,* loss of prey or reduction in species' fecundity), site-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions" (50 CFR 600.810).

As discussed in Section 3.9.2, Affected Environment, EFH has been designated in the VACAPES Range Complex. The Navy has determined that the preferred alternative would have no adverse effect to EFH. Therefore, EFH consultation with NMFS is not required. Impacts to EFH are addressed in Section 3.9 of this EIS/OEIS.

Sustainable Fisheries Act (SFA)

One of the most significant mandates in the SFA is the EFH provision, which provides the means to conserve fish habitat. The SFA requires that regional Fishery Management Councils (FMC) identify EFH for federally managed species (i.e., species covered under fishery management plans (FMP)). The SFA requires federal agencies to consult with the NMFS on activities that may adversely affect EFH, or when the NMFS independently learns of a federal activity that may adversely affect EFH. An adverse effect is defined as "any impact which reduces quality and/or quantity of EFH [and] may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species' fecundity), site-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions" (50 CFR 600.810).

Endangered Species Act

As discussed in Section 3.6.1.1, the Endangered Species Act (ESA) established protection over and conservation of threatened and endangered species. Portions of the VACAPES Range Complex EIS study area are within the historic ranges of the shortnose sturgeon and smalltooth sawfish, which are federally listed as endangered. Therefore, the ESA requirements discussed in Section 3.6.1.1 are applicable to the analysis for the shortnose sturgeon and smalltooth sawfish.

The Navy initiated the ESA Section 7 consultation process with NMFS on April 7, 2008 and prepared a Biological Evaluation (BE) to support the consultation process. Critical habitat for listed species has not been designated under the ESA in the VACAPES Range Complex Study Area. Copies of correspondence with the NMFS are provided in Appendix C of this EIS/OEIS.

K.10 Sea Birds and Migratory Birds

As previously discussed, the proposed action would not affect land areas. Therefore, this section focuses on seabirds and landbirds that could migrate through open water areas of the VACAPES Range Complex seasonally. Seabirds are birds whose normal habitat and food source is the sea, whether they utilize coastal waters (the nearshore), offshore waters (the continental shelf), or pelagic waters (the open sea) (Harrison, 1983). Migratory birds are any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their annual life cycle. The seabirds addressed in this EIS/OEIS are migratory birds.

The Migratory Bird Treaty Act (MBTA) of 1918 is the primary legislation in the United States established to conserve migratory birds. It implements the United States' commitment to four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. The MBTA prohibits the taking, killing, or possessing of migratory birds unless permitted by regulation. The species of birds protected by the MBTA appears in Title 50, Section 10.13, of the Code of Federal Regulations (50 CFR 10.13). On December 2, 2003, the President signed the 2003 National Defense Authorization Act. The Act provides that the Secretary of the Interior shall exercise his/her authority under the MBTA to prescribe regulations to exempt the Armed Forces from the incidental take prohibitions of the MBTA during military readiness activities authorized by the Secretary of Defense.

Congress defined military readiness activities as all training and operations of the Armed Forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. Congress further provided that military readiness activities do not include: (A) the routine operation of installation operating support functions, such as administrative offices, military exchanges, commissaries, water treatment facilities, storage facilities, schools, housing, motor pools, laundries, morale, welfare, and recreation activities, shops and mess halls; (B) the operation of industrial activities; or (C) the construction or demolition of facilities used for a purpose described in (A) or (B). The training operations that would occur in the VACAPES Range Complex under the proposed action are military readiness activities.

The final rule authorizing the Department of Defense to take migratory birds during military readiness activities was published in the Federal Register on February 28, 2007. The regulation can be found at 50 CFR Part 21. The regulation provides that the Armed Forces must confer and cooperate with the U.S. Fish and Wildlife Service (USFWS) on the development and implementation of conservation measures to minimize or mitigate adverse effects of a military readiness activity if it determines that such activity may have a significant adverse effect on a population of a migratory bird species.

The requirement to confer with the USFWS is triggered by a determination that the military readiness activity in question will have a significant adverse effect on a population of migratory bird species. An activity has a significant adverse effect if, over a reasonable period of time, it diminishes the capacity of a population of a migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem. A population is defined as ".a group of distinct, coexisting, same species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some point of the year), and adequately described so that the population can be effectively monitored to discern changes in its status." Assessment of impacts should take into account yearly variations and migratory movements of the impacted species.

As discussed in Section 3.6.1.1, the Endangered Species Act (ESA) established protection over and conservation of threatened and endangered species, including bird species that are federally listed as threatened or endangered. Two federally listed seabird species (Bermuda petrel, *Pterodroma cahow* and roseate tern, *Sterna dougallii*) potentially occur within the VACAPES Range Complex. Therefore, the

ESA requirements discussed in Section 3.6.1.1 are applicable to the analysis of the Bermuda petrel and roseate tern.

K.12 Land Use

Congress ceded title to the submerged lands to the states through the Submerged Lands Act of 1953 (SLA) (43 U.S.C. §§1301-1315 [2002]). However, the U.S. retained its navigational servitude and asserted paramount rights to conduct any activity on the submerged lands that promotes commerce, navigation, national defense, or international affairs. Naval training activities may need to be coordinated with the appropriate state agencies in order to avoid state or private uses that might conflict with the United States' paramount right to conduct national defense or navigational activities over state submerged lands.

K.13 Cultural Resources

Numerous laws and regulations mandate that possible effects on important cultural resources be considered during the planning and execution of federal undertakings. These laws define the compliance process and federal agency responsibilities, as well as prescribe the relationship among other involved agencies such as the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation officer (SHPO).

These mandates include provisions of the National Environmental Policy Act (NEPA) and Sections 106 and 110 of the National Historic Preservation Act (NHPA) and their implementing regulations at 40 Code of Federal Regulations (CFR) 1500 and 36 CFR 800, respectively. Section 110 of the NHPA requires federal agencies to inventory resources present in the Area of Potential Effect (APE). Section 106 requires the agency to evaluate these resources for eligibility for listing on the National Register of Historic Places (NRHP). The federal agency must also take into account the effects of their actions on properties listed or eligible for listing on the NRHP, and provide the ACHP an opportunity to comment on the project. The ACHP regulations at 36 CFR 800 specify a process of consultation to help meet this requirement.

Other relevant laws include the 1906 Antiquities Act (16 USC 431); the Historic Sites Act of 1935; Submerged Lands Act of 1953; the Archaeological Resource Protection Act of 1979 (16 USC 470aa-470-mm), which prohibits removal of items of archaeological interest from federal lands without a permit; the Abandoned Shipwreck Act of 1987; and the Abandoned Shipwreck Act Guidelines (NPS, 2007) (55 FR 50116, 55 FR 51528, and 56 FR 7875). The Abandoned Shipwreck Act extended the jurisdiction of abandoned shipwrecks in U.S. waters, considering them U.S. property, and transferred management authority to the states. However, lost U.S. Naval vessels and downed aircraft remain the property of the United States regardless of where they were lost or the passage of time. These resources are administered by the U.S. Naval Historical Center. Commissioned Confederate vessels are the property of the United States and are administered by the General Services Administration.

In 2004, the Sunken Military Craft Act (passed as Title XIV of the FY 2005 National Defense Authorization Act) preserved the "sovereign status of sunken U.S. military vessels and aircraft by codifying both their protected sovereign status and permanent U.S. ownership regardless of the passage of time" or where they are located, in recognition of the probable historic status of the craft and the fact that they often contain the remains of U.S. military personnel. The Sunken Military Craft Act explicitly states that the protection of the law "shall not be extinguished by the passage of time, regardless of when the sunken military craft sank regardless of age" (Trocolli, *et al*., 2005).

Government-to-government consultation with federally recognized American Indian tribes is required by Executive Order 13007, May 24, 1996. Military regulatory mandates include DoD Directive 47 10.I,

Chief of Naval Operations Instruction 5090.IA, and OPNAVINST 5090.1B, which describes protection of historic and cultural resources as an important part of the Navy's mission.

An Integrated Cultural Resources Management Plan (ICRMP) is an internal compliance and management tool used by the Navy to integrate the installation's cultural resources program with ongoing mission activities. No ICRMP has been completed for the at-sea portion of the VACAPES Range Complex, and no comprehensive underwater surveys of cultural resources have been conducted.

Under the NHPA, the APE is defined as the VACAPES OPAREA. Because all the APE/study area is in the open ocean and offshore areas, the only identified cultural resources present are historic shipwrecks or unidentified obstructions. Note that, depending on location, vessel affiliation, and whether the wreck meets the criteria of abandonment, shipwrecks in coastal waters may fall under the jurisdiction of the individual state, one or more federal agencies, or may belong to other nations. The APE includes any locales where underwater trenching, demolition, placement of systems, infrastructure, or equipment might affect submerged ruins, sites, features, or wrecks.

K.14 Transportation

Transportation information is assessed to ensure federal agencies focus their attention on human health and environmental conditions in minority and low-income communities and to ensure that disproportionately high and adverse human health or environmental effects on these communities are identified and addressed per EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* (1994) and EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (1997).

K.15 Demographics

Demographic information is assessed to ensure federal agencies focus their attention on human health and environmental conditions in minority and low-income communities and to ensure that disproportionately high and adverse human health or environmental effects on these communities are identified and addressed per EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* (1994) and EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (1997).

K.16 Regional Economy

The purpose of this section is to provide an economic backdrop to the discussion of the No Action Alternative, Alternative 1, and Alternative 2 in the VACAPES Range Complex. The regional economy is important to the analysis of the Alternatives due to the requirements imposed by Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* (1994) and EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (1997) that requires federal agencies to focus their attention and address effects on human health or environmental effects on these communities.

K.17 Recreation

Recreation information is assessed to ensure federal agencies focus their attention on human health and environmental conditions in minority and low-income communities and to ensure that disproportionately high and adverse human health or environmental effects on these communities are identified and addressed per EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* (1994) and EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (1997).

K.18 Environmental Justice

The purpose of this section is to provide an evaluation of the potential for disproportionate impacts to minorities, low-income populations, or children in the region of influence as a result of implementation of the No Action Alternative, Alternative 1, or Alternative 2. The communities of minority, low-income, and children are important to the analysis of the alternatives due to the requirements imposed by EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* (1994) and EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (1997) which requires federal agencies to focus their attention and address effects on human health or environmental effects on these communities.

K.19 Public Health and Safety

All range safety precautions and regulations contained in COMLANTFLTINST 3120.26, Atlantic Fleet Operating Areas and Warning Areas, apply in the OPAREA. In addition, FACSFAC VACAPES imposes additional safety requirements, which may be waived by the FACSFAC VACAPES Commanding Officer as the situation dictates.

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APPENDIX L

RECORD OF NON-APPLICABILITY

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NAVY RECORD OF NON-APPLICABILITY FOR CLEAN AIR ACT CONFORMITY FOR NAVY TRAINING AND TESTING IN THE VACAPES RANGE COMPLEX

The Proposed Action falls under the Record of Non-Applicability (RONA) category and is documented with this RONA.

Action Proponent: United States Fleet Forces

Location: Virginia Capes (VACAPES) Range Complex

Proposed Action Name: Navy Training and Testing within the VACAPES Range Complex

The Clean Air Act (CAA), 42 U.S.C. 7476[c] as amended in 1990 requires federal actions in nonattainment areas or maintenance areas to conform to an applicable State Implementation Plan (SIP). The SIP is designed to achieve or maintain an attainment designation of air pollutants as defined by the National Ambient Air Quality Standards (NAAQS). The criteria and procedures to be used to demonstrate conformity are explained in 40 CFR, Parts 51 and 93, "Determining Conformity of General Federal Actions to State or Federal Implementation Plans" (also known as the "General Conformity Rule"). Section 176(c) of the CAA as amended requires conformity analyses in non-attainment areas or maintenance areas.

Counties in Maryland, North Carolina, and Virginia's Eastern Shore bordering the Proposed Action Study Area are designated in "attainment," and thus the General Conformity Rule is not applicable to these areas. However, the northern tip of the Proposed Action Study Area borders Sussex County, Delaware, which is located in the Southern Delaware Intrastate Air Quality Control Region (40 CFR §80.178). This county is currently designated a "moderate" "non-attainment" area for 8- hour ozone.

Proposed Action & Emissions Summary:
The Proposed Action involves Navy training and testing in the VACAPES Range Complex. Navy training in the complex involves the use of aircraft, ships and submarines. Training and testing occur throughout the Range Complex. Certain areas of the Range Complex area used by certain platforms and certain areas receive a greater concentration of usage. The greatest concentration of operations evaluated under the Proposed Action include helicopter training events centered around the Hampton Roads, Virginia area and F/A-18 E/F training events off the coast of Virginia and North Carolina.

Navy testing and training in the area adjoining Sussex County, DE include aircraft flights associated test track flights conducted by Naval Air Systems Command. Air emissions associated with this flight training includes Nitrogen oxides (NO_X) and Volatile Organic Compounds (VOCs), which are ozone precursors. All aircraft flights in the special use airspace (W-386 areas Air-A and Air-B) adjoining Sussex County, DE are conducted at altitudes greater than 6,000 feet above mean sea level. According to U.S. EPA guidelines, emissions released into the atmosphere above the inversion base for pollutant containment, commonly referred to as the ``mixing height,'' (generally 3,000 ft. above ground level) do not have an effect on pollution concentrations at ground level. Furthermore, Navy training and testing within (W-386 areas Air-A and Air-B) are not expected to increase under the Proposed Action, though they will increase slightly in other areas within the Range Complex.

Affected Air Basin: Southern Delaware Intrastate Air Quality Control Region

Date RONA Prepared: April 21, 2008

RONA Prepared by: Naval Facilities Engineering Command, Atlantic

Proposed Action Exemption:

Provisions in the General Conformity Rule (Section 51.853(c) (1)) allow for exemptions from performing a conformity determination if total emissions of individual non-attainment or maintenance area pollutants resulting from the action fall below specific threshold values (i.e., *de minimis* levels) or would result in no emission increase. As discussed above, the change in the levels of NO_X and VOCs caused by this action would involve either emissions below *de minimis* levels, no emissions increase, or are conducted above the mixing height and would thus have no effect on pollutant concentrations at ground level. Therefore, the action is exempt from requirements under the General Conformity Rule.

To the best of my knowledge, the information provided is correct and accurate and I concur in the finding that the proposed Navy training and testing in the VACAPES Range Complex will conform to the Delaware State Implementation Plan.

RONA Approval:

Signature: _____ Date: _____
Name/Rank: _____

NAVY RECORD OF NON-APPLICABILITY FOR CLEAN AIR ACT CONFORMITY FOR NAVY TRAINING AND TESTING IN THE VACAPES RANGE COMPLEX

The Proposed Action falls under the Record of Non-Applicability (RONA) category and is documented with this RONA.

Action Proponent: United States Fleet Forces
Location: Virginia Capes (VACAPES) Range Complex
Proposed Action Name: Navy Training and Testing within the VACAPES Range Complex

The Clean Air Act (CAA), 42 U.S.C. 7476[c] as amended in 1990 requires federal actions in nonattainment areas or maintenance areas to conform to an applicable State Implementation Plan (SIP). The SIP is designed to achieve or maintain an attainment designation of air pollutants as defined by the National Ambient Air Quality Standards (NAAQS). The criteria and procedures to be used to demonstrate conformity are explained in 40 CFR, Parts 51 and 93, "Determining Conformity of General Federal Actions to State or Federal Implementation Plans" (also known as the "General Conformity Rule"). Section 176(c) of the CAA as amended requires conformity analyses in non-attainment areas or maintenance areas.

Counties in Maryland, North Carolina, and Virginia's Eastern Shore bordering the Proposed Action Study Area are designated in "attainment," and thus the General Conformity Rule is not applicable to these areas. However, the Proposed Action Study Area also includes the Hampton Roads Air Quality Control Region, which is an attainment area with a maintenance plan for the 8-hour ozone standard.

Proposed Action & Emissions Summary:
The Proposed Action involves Navy training and testing in the VACAPES Range Complex. Navy training in the complex involves the use of aircraft, ships and submarines. Training and testing occur throughout the Range Complex. Certain areas of the Range Complex area used by certain platforms and certain areas receive a greater concentration of usage. The greatest concentration of operations evaluated under the Proposed Action include helicopter training events centered around the Hampton Roads, Virginia area and F/A-18 E/F training events off the coast of Virginia and North Carolina.

Proposed Navy helicopter training will occur within the Hampton Roads Air Quality Control Region of Virginia. Air emissions associated with this training includes Nitrogen oxides (NO_X) and Volatile Organic Compounds (VOCs), which are ozone precursors. Helicopter emissions were evaluated in an Environmental Assessment (EA) for the Homebasing of the MH-60R/S on the East Coast of the United States (DoN, 2002). The EA evaluated a proposed increase of 63 helicopter aircraft at Naval Station Norfolk through 2015. These are the same helicopters evaluated for the proposed training in this EIS/OEIS.

The results of the air emissions analysis in the MH-60 R/S EA are shown in the table below. As shown in the table air emission changes to both NO_x and VOC totals are below the *de minimis* thresholds of 100 tons per year (tpy) for impacts requiring evaluation under the General Conformity Rule.

AIR EMISSIONS ESTIMATES FOR MH-60S HOMEBASING AT NAVAL STATION NORFOLK [a/]

Net Change to Air Emissions (in tons/year) at Naval Station Norfolk: 2002 to 2015					
Source	**VOC [b/]**	**NO_x**	**CO**	**SO_2**	**PM_{10}**
Helicopter operations	-7.98	34.72	29.07	2.26	20.61
Helicopter maintenance run-ups	-0.34	5.00	5.49	0.31	2.66
Total net change	-8.32	39.72	34.56	2.57	23.27

a/ Source: DoN 2002.

b/ VOC = Volatile organic compound; NO_x = nitrogen oxides; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = Particulate matter (diameter of 10 microns or less).

Affected Air Basin: Hampton Roads Air Quality Control Region

Date RONA Prepared: April 21, 2008

RONA Prepared by: Naval Facilities Engineering Command, Atlantic

Proposed Action Exemption:

Provisions in the General Conformity Rule (Section 51.853(c) (1)) allow for exemptions from performing a conformity determination if total emissions of individual non-attainment or maintenance area pollutants resulting from the action fall below specific threshold values (i.e., *de minimis* levels) or would result in no emission increase. As discussed above, the change in the levels of NO_X and VOCs caused by this action would involve emissions below *de minimis* levels, and would thus have no effect on pollutant concentrations at ground level. Therefore, the action is exempt from requirements under the General Conformity Rule.

To the best of my knowledge, the information provided is correct and accurate and I concur in the finding that the proposed Navy training and testing in the VACAPES Range Complex will conform to the Virginia State Implementation Plan.

RONA Approval:

Signature: _____ Date: _____
Name/Rank: _____

NAVY RECORD OF NON-APPLICABILITY FOR CLEAN AIR ACT CONFORMITY
for
NAVY TRAINING and TESTING in the VACAPES RANGE COMPLEX

The Proposed Action falls under the Record of Non-Applicability (RONA) category and is documented with this RONA.

Action Proponent: United States Fleet Forces
Location: Virginia Capes (VACAPES) Range Complex
Proposed Action Name: Navy Training and Testing within the VACAPES Range Complex

The Clean Air Act (CAA), 42 U.S.C. 7476[c] as amended in 1990 requires federal actions in nonattainment areas or maintenance areas to conform to an applicable State Implementation Plan (SIP). The SIP is designed to achieve or maintain an attainment designation of air pollutants as defined by the National Ambient Air Quality Standards (NAAQS). The criteria and procedures to be used to demonstrate conformity are explained in 40 CFR, Parts 51 and 93, "Determining Conformity of General Federal Actions to State or Federal Implementation Plans" (also known as the "General Conformity Rule"). Section 176(c) of the CAA as amended requires conformity analyses in non-attainment areas or maintenance areas.

Counties in Maryland, North Carolina, and Virginia's Eastern Shore bordering the Proposed Action Study Area are designated in "attainment," and thus the General Conformity Rule is not applicable to these areas. However, the Proposed Action Study Area also includes the Hampton Roads Air Quality Control Region, which is an attainment area with a maintenance plan for the 8-hour ozone standard.

Proposed Action & Emissions Summary:
The Proposed Action involves Navy training and testing in the VACAPES Range Complex. Navy training in the complex involves the use of aircraft, ships and submarines. Training and testing occur throughout the Range Complex. Certain areas of the Range Complex area used by certain platforms and certain areas receive a greater concentration of usage. The greatest concentration of operations evaluated under the Proposed Action include helicopter training events centered around the Hampton Roads, Virginia area and F/A-18 E/F training events off the coast of Virginia and North Carolina.

Proposed Navy helicopter training will occur within the Hampton Roads Air Quality Control Region of Virginia. Air emissions associated with this training includes Nitrogen oxides (NO_X) and Volatile Organic Compounds (VOCs), which are ozone precursors. Helicopter emissions were evaluated in an Environmental Assessment (EA) for the Homebasing of the MH-60R/S on the East Coast of the United States (DoN, 2002). The EA evaluated a proposed increase of 63 helicopter aircraft at Naval Station Norfolk through 2015. These are the same helicopters evaluated for the proposed training in this EIS/OEIS.

The results of the air emissions analysis in the MH-60 R/S EA are shown in the table below. As shown in the table air emission changes to both NO_x and VOC totals are below the *de minimis* thresholds of 100 tons per year (tpy) for impacts requiring evaluation under the General Conformity Rule.

AIR EMISSIONS ESTIMATES FOR MH-60S HOMEBASING AT NAVAL STATION NORFOLK [a/]

Net Change to Air Emissions (in tons/year) at Naval Station Norfolk: 2002 to 2015					
Source	**VOC [b/]**	**NO_x**	**CO**	**SO_2**	**PM_{10}**
Helicopter operations	-7.98	34.72	29.07	2.26	20.61
Helicopter maintenance run-ups	-0.34	5.00	5.49	0.31	2.66
Total net change	-8.32	39.72	34.56	2.57	23.27

a/ Source: DoN 2002.

b/ VOC = Volatile organic compound; NO_x = nitrogen oxides; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = Particulate matter (diameter of 10 microns or less).

Affected Air Basin: Hampton Roads Air Quality Control Region

Date RONA Prepared: April 21, 2008

RONA Prepared by: Naval Facilities Engineering Command, Atlantic

Proposed Action Exemption:

Provisions in the General Conformity Rule (Section 51.853(c) (1)) allow for exemptions from performing a conformity determination if total emissions of individual non-attainment or maintenance area pollutants resulting from the action fall below specific threshold values (i.e., *de minimis* levels) or would result in no emission increase. As discussed above, the change in the levels of NO_X and VOCs caused by this action would involve emissions below *de minimis* levels, and would thus have no effect on pollutant concentrations at ground level. Therefore, the action is exempt from requirements under the General Conformity Rule.

To the best of my knowledge, the information provided is correct and accurate and I concur in the finding that the proposed Navy training and testing in the VACAPES Range Complex will conform to the Virginia State Implementation Plan.

RONA Approval:

Signature: _____ Date: _____
Name/Rank: _____