

APPENDIX A

Agency Coordination

Donofrio, Kristen L. NAO

From: David O'Brien - NOAA Federal [david.l.o'brien@noaa.gov]
Sent: Thursday, January 03, 2013 10:25 AM
To: Donofrio, Kristen L. NAO
Cc: Christine Vaccaro; Lockwood, Keith B NAO
Subject: NOAA MOC-A dredging, Elizabeth River

Hello Kristen,

I hope you had a wonderful Christmas and Happy New Year.

I have reviewed the coordination materials you sent along with the bathymetry data I requested for the the proposed dredging at the NOAA Marine Operations Center-Atlantic (MOC-A) located along the Elizabeth River in the City of Norfolk, Virginia. The project includes dredging the approach and berthing areas to -25 ft. MLLW using either a mechanical clamshell bucket or hydraulic cutterhead dredge. The approximately 135,000 cu. yds. of dredged material will be transported to Craney Island Dredge Material Management Area (CIDMMA) by hydraulic pipeline if a hydraulic cutterhead is used or by barge/scow if mechanically dredged. As you know, the Elizabeth River is designated as a confirmed anadromous fish use area by the Virginia Department of Game and Inland Fisheries (DGIF) and may include adult or sub-adult Atlantic sturgeon, federally listed as endangered.

NOAA Fisheries Service concurs with your determination that the proposed dredging will not substantially adversely affect essential fish habitat (EFH) and is of the opinion that given the scope of the project and width of the Elizabeth River at the project site, a time of year restriction to help protect anadromous fish is not warranted.

Please note that this EFH determination does not relieve you of your responsibilities for consultation regarding potential impacts to threatened and endangered species under the purview of NOAA Fisheries Service. Therefore, please contact Ms. Christine Vaccaro, NOAA Protected Resources Division (978-281-9167) to discuss your consultation obligations under Section 7 of the Endangered Species Act (ESA) regarding potential impacts to the federally listed Atlantic sturgeon.

Thank you for the opportunity to comment on this project. Please feel free to contact me if you have any questions.

Regards,

Dave

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UNITED STATES DEPARTMENT OF COMMERCE
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NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
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DEC 28 2012

Elizabeth Waring
Department of the Army
Norfolk District Corps of Engineers
Fort Norfolk 803 Front Street
Norfolk, VA 23510-1096

Re: Dredging of NOAA-MOC-A in the Elizabeth River

Dear Ms. Waring,

Your letter dated October 12, 2012, was in regard to the Army Corps of Engineers, Norfolk District's, proposal for dredging at the NOAA Marine Operations Center-Atlantic (MOC-A) project near Smith Creek in the Elizabeth River in Norfolk Harbor, Norfolk, Virginia. In response to our request, we also received additional information from you on November 1, 2012. In your letter, you requested our concurrence with your determination that the project is not likely to adversely affect any species listed as threatened or endangered under the Endangered Species Act (ESA) of 1973, as amended. Based on the information provided in your letter and the best available information, we have conducted a consultation in accordance with section 7 of the ESA. We concur with your determination. Our supporting analysis is provided below.

Proposed Action

The NOAA MOC-A is located in Norfolk Harbor in Norfolk, Virginia, at the junction of the Elizabeth River and Smith Creek. This portion of the waterway is highly industrialized and heavily used by vessels.

The action consists of dredging the approach and berthing areas to -25 feet deep at mean lower low water (MLLW). Hydraulic cutterhead or mechanical clamshell bucket dredges will be used to remove approximately 135,000 cubic yards of material from 9.4 acres of subtidal substrate. The dredged material will then be transported to the Craney Island Dredged Material Management Area (CIDMMA) by hydraulic pipeline if cutterhead dredges are used or by barge/scow, if mechanical means are used.

NMFS listed species in Action Area

The action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR § 402.02). For this project, the action area includes the dredge footprint as well as the underwater area where effects of dredging (e.g., increase in suspended sediment) will occur, as well as the vessel course for dredged material disposal. Based on an analysis of hydraulic dredging activities (ACOE, 1983), increased sediment levels are likely to be present for approximately 1,000 feet downstream of a



dredge area. Additionally, based upon analysis of mechanical dredging activities (Burton, 1993; ACOE, 2007), suspended sediment plumes are expected to be fully dissipated at a distance of 2,034 to 4,921 feet from the dredge site. Assuming mechanical dredges will be used, then barges will also be moving dredged sediment to the disposal area, which is located downstream from Norfolk Harbor, Virginia, in the Elizabeth River, and thus the movement of this material and the vessel course are also included in the action and the action area.

Sea Turtles

Four species of ESA-listed threatened or endangered sea turtles under our jurisdiction may be found seasonally in the coastal waters of Virginia: federally threatened Northwest Atlantic Ocean distinct population segment (DPS) of loggerhead (*Caretta caretta*), and the federally endangered Kemp's ridley (*Lepidochelys kempi*), green (*Chelonia mydas*) and leatherback (*Dermochelys coriacea*) sea turtles, although the latter species tends to frequent offshore habitats (not within bay systems/estuarine habitat) and is unlikely to occur in the action area (i.e., depths up to approximately 25 feet). In general, listed sea turtles are seasonally distributed in coastal U.S. Atlantic waters, migrating to and from habitats extending from Florida to New England, with overwintering concentrations in southern waters. Sea turtles are expected to be in the Chesapeake Bay during warmer months. This typically equates to April through November in Virginia waters (Morreale, 1999; Morreale, 2003; Morreale and Standora, 2005; Shoop and Kenney, 1992).

The sea turtles in the Chesapeake Bay area are typically small juveniles with the most abundant species being the loggerhead followed by the Kemp's ridley sea turtle. Several studies have examined the seasonal distribution of sea turtles in the mid-Atlantic, including Maryland and Virginia. Sea turtles begin appearing in nearshore habitats of the mid-Atlantic as water temperatures rise to greater than 11°C during the spring and then remain in the region throughout the summer and fall (Morreale and Standora 2005). As temperatures decline in the fall (usually beginning the first week of November), sea turtles tend to leave their coastal habitats and join a larger contingent of turtles migrating southward to overwinter in southern waters. Consequently, by the end of November, listed sea turtles have left the waters of the Chesapeake Bay (Shoop and Kenney, 1992; Musick and Limpus, 1997; Morreale and Standora, 2005). Sea turtles are not known to move into the Elizabeth River to forage due to 1) rapid reductions in salinity in these rivers with increasing distance from the confluence with the Chesapeake Bay, and 2) the consequent reduction in suitable sea turtle prey in these less saline habitats. Prey reductions are also evident because of the busy, industrialized and highly disturbed nature of the port of Norfolk, Virginia. As such, sea turtles are not expected to be present in the action area, including the dredging footprint, as well as at the dredged disposal area, or any areas that occur within 4,921 feet, and no effects to these species will occur as a result of the action. Sea turtles will not be considered further in this consultation.

Atlantic sturgeon

We published two final rules listing five distinct population segments (DPSs) of Atlantic sturgeon in 2012. Atlantic sturgeon originating from the New York Bight, Chesapeake Bay, South Atlantic and Carolina DPSs were listed as endangered, while the Gulf of Maine DPS was

listed as threatened (77 FR 5880; 77 FR 5914, February 6, 2012). The marine range of all five DPSs extends along the Atlantic coast from Canada to Cape Canaveral, Florida.

Atlantic sturgeon spawn in their natal river, with spawning migrations generally occurring during February-March in southern systems, April-May in Mid-Atlantic systems, and May-July in Canadian systems (Murawski and Pacheco, 1977; Smith, 1985; Bain, 1997; Smith and Clugston, 1997; Caron *et al.*, 2002). Juveniles remain in the river/estuary until approximately age 2 and at lengths of 30-36 inches before emigrating to open ocean as subadults (Holland and Yelverton, 1973; Dovel and Berggren, 1983; Dadswell, 2006; ASSRT, 2007). After emigration from the natal river/estuary, subadults and adult Atlantic sturgeon travel within the marine environment, typically in waters between 16 to 164 feet in depth, using coastal bays, sounds, and oceanic waters (Vladykov and Greeley, 1963; Murawski and Pacheco, 1977; Dovel and Berggren, 1983; Smith, 1985; Collins and Smith, 1997; Welsh *et al.*, 2002; Savoy and Pacileo, 2003; Stein *et al.*, 2004; Laney *et al.*, 2007; Dunton *et al.* 2010; Erickson *et al.* 2011). However, the distribution of Atlantic sturgeon is strongly associated with prey availability, and as a result, Atlantic sturgeon may occur in small tributaries of larger rivers if suitable forage (e.g., benthic invertebrates such as mollusks and crustaceans) and appropriate habitat conditions are present.

Based on the best available information, Atlantic sturgeon originating from any of the five DPSs could occur in the James River or potentially move into the Elizabeth River to search for foraging habitat. Environmental cues appear to play a strong role in use of the James River (presumably Chesapeake Bay DPS) (Hager *et al.*, 2011). Adult sturgeon enter the river in spring when water temperatures are around 17° C, and occur from river mile 18 to river mile 67 before departing from the river in June when water temperatures are around 24° C (Hager *et al.*, 2011). A tracking array on the James River was configured to obtain migration and movement data. The array consists of receivers that detect individually tagged fish as they pass through the array. Tracking data for spring 2010 demonstrated an aggregation of sturgeon in freshwater areas at river mile 48, suggesting the possibility of suitable spawning habitat in this area (Hager *et al.*, 2011). Individuals have not been tracked or tagged in the Elizabeth River at this time. If individuals were to occur in the Elizabeth River, they would likely be sub-adult or adult sturgeon based on the location of the river near the mouth of the James River, and may move into the river to search for suitable foraging areas.

Adult sturgeon appear to be absent from the James River for most of the summer until late August when tagged fish are once again detected in the river (Hager *et al.*, 2011, Balazik, 2012). During the late summer-early fall residency (August-October), fish ascend the river rapidly and congregate in upriver sites between rkm 48 and the fall line near Richmond, VA; possibly in response to physiologically stressful conditions (e.g., low dissolved oxygen and elevated water temperature) in the lower James River and Chesapeake Bay or for a fall spawning event (Hager *et al.*, 2011; Balazik, 2012). As temperature declines in late September or early October, adults disperse through downriver sites and begin to move out of the river (Hager *et al.*, 2011). By November, adults occupy only lower river sites (Hager *et al.*, 2011). By December, adults are undetected on the tracking array and, thus, are presumed to be out of the river (Hager *et al.*, 2011).

Effects of the Action

Dredging, Entrainment, and Material Placement

As noted above, dredging will be carried out with a hydraulic cutterhead dredge or with a mechanical dredge. Atlantic sturgeon are not susceptible to entrainment in mechanical, clam shell dredges due to the shape and methods in which the dredge is used, or to entrainment in cutterhead dredges, presumably because of the slow intake velocity of the cutterhead dredge. The only life stages of Atlantic sturgeon that could be present in the action area and subject to effects of the action are sub-adult and adult Atlantic sturgeon based on the location of the Elizabeth River in relation to the James River and the Chesapeake Bay. Juveniles and early life stages in the James River would be located near the spawning and rearing grounds well upstream of the action area. The presence of Atlantic sturgeon adults or sub-adults in the industrialized stretch of the Elizabeth River is not likely because this riverine habitat is inconsistent with their preferred foraging habitat where mollusks and crustaceans are plentiful. The action area is within an area where productive subtidal habitat is not common due to consistent dredging, industry, and water quality impacts. Since the Atlantic sturgeon are not expected in the action area, and they are not subject to entrainment in the types of dredges proposed for usage on this project, all direct effects to Atlantic sturgeon as a result of dredging will be discountable. Additionally, because Atlantic sturgeon are not expected to be in the vicinity of the action area, direct effects that result from dredged material placement at the oyster restoration sites are also not expected. All effects will be discountable.

Water Quality Effects

Dredging operations cause sediment to be suspended in the water column. This results in a sediment plume in the water, typically radiating from the dredge site and decreasing in concentration as sediment falls out of the water column as distance increases from the dredge site. The nature, degree, and extent of sediment suspension around a dredging operation are controlled by many factors including: the particle size distribution, solids concentration, and composition of the dredged material; the dredge type and size, discharge/cutter configuration, discharge rate, and solids concentration of the slurry; operational procedures used; and the characteristics of the hydraulic regime in the vicinity of the operation, including water composition, temperature and hydrodynamic forces (i.e., waves, currents, etc.) causing vertical and horizontal mixing (ACOE, 1983). The proposed dredging will cause a temporary increase in the amount of sedimentation in the action area; however, suspended sediment is expected to settle out of the water column within a few hours and any increase in turbidity will be short term. If hydraulic means are used to remove sediment then sediments will be dissipated at a distance of 1,000 feet (ACOE, 1983). For mechanical dredging activities suspended sediment plumes are expected to be fully dissipated at a distance of 2,034 to 4,921 feet from the dredge site (Burton, 1993; ACOE, 2007).

Early life stages are generally more susceptible to increased suspended sediments than subadult and adult Atlantic sturgeon, and early life stages are not present in or near the action area, where direct or indirect effects could play a role. Studies of the effects of turbid waters on fish suggest

that concentrations of suspended solids can reach thousands of milligrams per liter before an acute toxic reaction is expected (Burton, 1993). The studies reviewed by Burton demonstrated lethal effects to fish at concentrations of 580.0 mg/L to 700,000.0 mg/L depending on species. Studies with striped bass adults showed that pre-spawners did not avoid concentrations of 954.0 to 1,920.0 mg/L to reach spawning sites (Summerfelt and Moiser, 1976 and Combs, 1979 in Burton, 1993). While there have been no directed studies on the effects of total suspended solids (TSS) on Atlantic sturgeon, shortnose sturgeon sub-adults and adults are often documented in turbid water and Dadswell (1984) reports that sturgeon are more active under lowered light conditions, such as those in turbid waters. Additionally, Atlantic sturgeon tend to frequent the salt fronts of rivers where turbidity is higher than other portions of the waterbody. As such, Atlantic sturgeon are assumed to be as least as tolerant to suspended sediment as shortnose sturgeon and other estuarine fish such as striped bass. Since early life stages are not present in or near the action area, older Atlantic sturgeon that may venture into the Elizabeth River in an attempt to forage are tolerant of turbid conditions. In addition, turbidity curtains will be used during the timeframe when a larger number of Atlantic sturgeon may be moving up the James River, and turbidity, in general, will be confined to a maximum area of 4,921 feet within the Elizabeth River and will not likely not reach the James River, where sturgeon are more likely to be present. As such, all effects to Atlantic sturgeon will be insignificant and discountable.

Effects on Prey

There is likely to be some disturbance or removal of benthic resources in the action area; however, as stated previously, these resources are not expected to provide suitable forage for Atlantic sturgeon due to the industrialized nature of the area and low quality river bottom in the vicinity of the dredging, pile driving and disposal sites. Mollusks and crustaceans in suitable amounts are not expected to colonize the stretch of river associated with the action area, where constant vessel disturbance, shoreline hardening (sheet-piling), and poor water quality exist. Any effects of dredging and disposal to foraging Atlantic sturgeon will be insignificant and discountable because: (1) the area to be affected by dredging and disposal is small, and the effects of the action will not extend into the James River (beyond a maximum of 4,921 feet from the action area) where Atlantic sturgeon are known to occur; and (2) suitable forage habitat for Atlantic sturgeon is not known to be present in or downstream of the action area within the Elizabeth River, so if sturgeon do venture into the river searching for foraging in the action area, they will not likely remain to feed.

Vessel Interactions

While the exact number of Atlantic sturgeon killed as a result of being struck by boat hulls or propellers is unknown, it is a concern in some areas. The factors relevant to determining the risk to Atlantic sturgeon from vessel strikes are currently unknown, but they may be related to size and speed of the vessels, navigational clearance (i.e., depth of water and draft of the vessel) in the area where the vessel is operating, and the behavior of Atlantic sturgeon in the area (e.g., foraging, migrating, etc.). We do not believe that an increase in vessel traffic associated with the action would increase the risk of interactions between Atlantic sturgeon and vessels, because 1) the probability of Atlantic sturgeon being present in this industrialized stretch of the river is low, and 2) the increase in vessel traffic, including barges that would transport dredged material) will be minimal compared to the vessel traffic that already uses this stretch of the river.


As explained above, there is limited information on vessel strikes and many variables that likely affect the potential for vessel strikes in a given area. The proposed action will only involve the addition of slow moving dredging and disposal vessels within the action area, where sturgeon are not known to frequent regularly. If sturgeon are present, they will be able to move out of the way of the slow moving vessels associated with the project. Therefore, effects to Atlantic sturgeon from the increase in vessel traffic will be insignificant and discountable.

Conclusions

Based on the analysis that any effects to ESA-listed species will be insignificant or discountable, we are able to concur with your determination that the proposed action is not likely to adversely affect any listed species under NMFS jurisdiction. Therefore, no further consultation pursuant to section 7 of the ESA is required.

Reinitiation of consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in the consultation; (b) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the consultation; or (c) if a new species is listed or critical habitat designated that may be affected by the identified action. No take is anticipated or exempted. If there is any incidental take of a listed species, reinitiation would be required. Should you have any questions about this correspondence, please contact Chris Vaccaro at (978) 281-9167 or by e-mail (Christine.Vaccaro@noaa.gov).

Sincerely,


John K. Bullard
Regional Administrator

PCTS: NER-2012-9234

File Code: H:\Section 7 Team\Section 7\Non-Fisheries\ACOE\Informal\2012\Norfolk District\NOAA MOC-A

Ec: O'Brien, NMFS/HCD
Vaccaro, NMFS/NER
Donfrio, ACOE/Norfolk

References

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RECORD OF COORDINATION

Project Name: NOAA MOC-A Dredging Project
Lead Agency: Corps of Engineers-Norfolk District
City/County: City of Norfolk, Virginia

Agency Contact: Kristen Donofrio

DHR File Number: 2012-4152
Date Received: October 16, 2012

- Project will have No Effect on historic properties. Should unidentified historic properties be discovered during implementation of the project, please notify DHR immediately.
- Project will have No Adverse Effect on the following historic property: **Battle of the Ironclads (DHR ID# 114-5471)**. Should unidentified historic properties be discovered during implementation of the project, please notify DHR immediately.
- Additional information is required in order to complete our review of the project:
 - USGS quad sheet(s) with the project boundaries and Area of Potential Effect clearly marked.
 - More detailed description of project plans, including specific information regarding anticipated ground disturbance and potential visual impacts.
 - Data Sharing System (DSS) maps depicting the location of the APE and previously identified cultural resources.
 - DHR requests an identification (Phase I) cultural resource survey of the project APE. The research design and technical report should be in keeping with DHR's *Survey Guidelines* (rev. 2011).
- See attached comments.

Brad McDonald, Archaeologist
Office of Review and Compliance

October 23, 2012
Date

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APPENDIX B

Coastal Consistency Determination and Clean Air Act General Conformity Rule

**Coastal Zone Management Act (CZMA) Consistency Determination
for the National Oceanic and Atmospheric Administration Marine Operations Center-
Atlantic (NOAA MOC-A) Approach and Berthing Areas Dredging Project at the
NOAA MOC-A Facility located in Norfolk, Virginia**

This document provides the Commonwealth of Virginia with the U.S. Army Corps of Engineers, Norfolk District's (USACE) Coastal Consistency Determination (CCD) under CZMA section 307(c)(1) and 15 CFR Part 930, sub-part C, for the dredging project at the NOAA MOC-A Facility located in Norfolk, Virginia. The information in this CCD is provided pursuant to 15 CFR Section 930.39.

Proposed Federal Agency Activity

The proposed federal action is the maintenance and new work dredging of the approach and berthing area of the National Oceanic and Atmospheric Administration Marine Operations-Atlantic (NOAA MOC-A) in Norfolk, Virginia. The project site, approximately 9.4 acres, will be hydraulically or mechanically dredged to provide a maintained depth of -25ft mean lower low water (MLLW). Dredged material will be placed in the Craney Island Dredged Material Management Area (CIDMMA). Material will be transported to CIDMMA by hydraulic pipeline if hydraulically dredged or by barge/scow if mechanically dredged. Approximately 135,000 cubic yards (CY) of material will be removed from the approach and berthing areas.

Background

The NOAA MOC-A provides centralized management and logistical support to nine NOAA ships on the East Coast and the Gulf of Mexico and serves as a temporary homeport for NOAA ships, servicing vessels transitioning to and from service. Outfitting and post-delivery availability periods for new vessels, and disposal preparations for deactivated vessels are accomplished at the MOC-A facility due to the concentration of marine engineering, electronics engineering, and administrative, logistical, and operational support personnel at the facility. The site is NOAA-owned and operated, supporting 61 shoreside personnel and 190 shipboard personnel. The facility also supports 26 personnel from the Atlantic Hydrographic Branch in the Hydrographic Surveys Division of NOAA's National Ocean Service.

Previous maintenance dredging occurred in the 1960s and was conducted to a maximum depth of -20ft MLLW. The additional -5ft to be removed in the upcoming cycle is new work to allow adequate draft and keel clearance. The maintained depth of -25ft MLLW is needed for NOAA MOC-A to be fully able to support regional missions and operations.

Enforceable Policies

The Virginia Coastal Resources Management Program (VCP) contains the below enforceable policies (A-I). More information can be found in the Final Environmental Assessment for this project.

A. Fisheries Management

This program stresses the conservation and enhancement of finfish and shellfish resources and the promotion of commercial and recreational fisheries to maximize food production and recreational opportunities.

There are no commercial or recreational fisheries located in the project site; therefore, no impacts are anticipated.

B. Subaqueous Lands Management

This management program for subaqueous lands establishes conditions for granting or denying permits to use state-owned bottomlands based on considerations of potential effects on marine and fisheries resources, wetlands, adjacent or nearby properties, anticipated public and private benefits, and water quality standards established by the Department of Environmental Quality, Water Division.

Impacts to water quality will be minor and temporary, consisting of localized increases in turbidity due to dredging. There is no Submerged Aquatic Vegetation within the project area or placement site therefore, no impacts are anticipated. Commercial or recreational boaters and the NOAA MOC-A vessels will benefit from this project due to better access Smith Creek and the NOAA MOC-A facility.

C. Wetlands Management

The purpose of the wetlands management program is to preserve tidal and non-tidal wetlands, prevent their despoliation, and accommodate economic development in a manner consistent with wetlands preservation.

There are no wetlands located in the dredging area or placement site; therefore, no impacts are anticipated.

D. Dunes Management

Dune protection is carried out pursuant to the Coastal Primary Sand Dune Protection Act and is intended to prevent destruction or alteration of primary dunes.

There are no sand dunes located in the project area; therefore, no impacts are anticipated.

E. Non-point Source Pollution Control

Virginia's Erosion and Sediment Control Law requires soil-disturbing projects to be designed to reduce soil erosion and to decrease inputs of chemical nutrients and sediments to the Chesapeake Bay, its tributaries, and other rivers and waters of the Commonwealth.

The dredging of NOAA MOC-A's approach and berthing area and placement of dredged material will not involve any land-based soil disturbing activities; therefore, adherence to the Erosion and Sediment Control Law is not applicable.

F. Point Source Pollution Control

Point source pollution control is accomplished through the implementation of the National Pollutant Discharge Elimination System permit program established pursuant to Section 402 of the Federal Clean Water Act and administered in Virginia as the Virginia Pollutant Discharge Elimination System permit program.

A Virginia Pollutant Discharge Elimination System (VPDES) permit is not required for this project since dredging projects, which are regulated under Section 404 of the Clean Water Act, are exempt from VPDES regulations.

G. Shoreline Sanitation

The purpose of this program is to regulate the installation of septic tanks, set standards concerning soil types suitable for septic tanks, and specify minimum distances that tanks must be placed away from streams, rivers, and other waters of the Commonwealth.

This project does not involve septic tanks; therefore, adherence to this program is not applicable.

H. Air Pollution Control

The program implements the Federal Clean Air Act to provide a legally enforceable State Implementation Plan for the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS).

The Clean Air Act prohibits Federal entities from taking actions which do not conform to the State implementation plan (SIP) for attainment and maintenance of the national ambient air quality standards (NAAQS).

Air emissions due to the dredging of NOAA MOC-A's approach and berthing area will be minor and temporary and will not violate provisions of the Virginia's State Implementation Plan. A Record of Non-applicability has been prepared in conjunction with the EA.

I. Coastal Lands Management

Coastal Lands Management is a state-local cooperative program administered by the DCR's Division of Stormwater Management – Local Implementation (previously the Division of Chesapeake Bay Local Assistance) and 88 localities in Tidewater, Virginia established pursuant to the Chesapeake Bay Preservation Act; Virginia Code §§ 10.1-2100 through 10.1-2114 and Chesapeake Bay Preservation Area Designation and Management Regulations; Virginia Administrative code 9 VAC10-20-10 et seq.

While NOAA has determined that the CZMA does not grant states regulatory authority over activities on federal lands, federal activities affecting Virginia's coastal resources must be consistent with the Bay Act and the Regulations as one of the enforceable programs of Virginia's Coastal Zone Management Program.

This project does not involve any land development and therefore is not subject to the Chesapeake Bay Preservation Act.

Advisory Policies for Geographic Area of Particular Concern

a. Coastal Natural Resource Areas

Coastal Natural Resource Areas are areas that have been designated as vital to estuarine and marine ecosystems and/or are of great importance to areas immediately inland of the shoreline. These areas include the following resources: wetlands, aquatic spawning, nursing, and feeding grounds, coastal primary sand dunes, barrier islands, significant wildlife habitat areas, public recreation areas, sand gravel resources, and underwater historic sites.

The project area may contain spawning, nursing, and/or feeding grounds for finfish and shellfish. Habitat for finfish and shellfish will not be harmed and may be improved as a result of this project. An Essential Fish Habitat (EFH) Assessment is being coordinated with NOAA Fisheries and is attached to the EA.

b. Coastal Natural Hazard Areas

This policy covers areas vulnerable to continuing and severe erosion and areas susceptible to potential damage from wind, tidal, and storm related events including flooding. New buildings and other structures should be designed and sited to minimize the potential for property damage due to storms or shoreline erosion. The areas of concern are highly erodible areas and coastal high hazard areas, including flood plains.

The project area contains no coastal natural hazard areas; therefore, adherence to this program is not applicable.

c. Waterfront Development Areas

These areas are vital to the Commonwealth because of the limited number of areas suitable for waterfront activities. The areas of concern are commercial ports, commercial fishing piers, and community waterfronts.

While this project does not include onshore development, it does support waterfront access activities by providing a deeper berthing and approach area to the NOAA MOC-A facility.

Advisory Policies for Shorefront Access Planning and Protection

a. Virginia Public Beaches

These public shoreline areas will be maintained to allow public access to recreational resources.

This project does not involve any shoreline activity; therefore, this project will not affect public access to beaches.

b. Virginia Outdoors Plan (VOP)

The VOP, which is published by Virginia's Department of Conservation and Recreation (DCR), identifies recreational facilities in the Commonwealth that provide recreational access. Prior to initiating any project, consideration should be given to the proximity of the project site to recreational resources identified in the VOP.

This project is consistent with the Virginia Outdoor Plan for Region 23, Hampton Roads, whose main recreational activities revolve around water access and boating. This project will provide deepwater access to the NOAA MOC-A facility for NOAA vessels.

c. Parks, Natural Areas, and Wildlife Management Areas

The recreational values of these areas should be protected and maintained.

The project area contains no Parks, Natural Areas, or Wildlife Management Areas.

d. Waterfront Recreational Land Acquisition

It is the policy of the Commonwealth to protect areas, properties, lands, or any estate or interest therein, of scenic beauty, recreational utility, historical interest, or unusual features which may be acquired, preserved, and maintained for the citizens of the Commonwealth.

This project does not limit the ability of the Commonwealth in any way to acquire, preserve, or maintain waterfront recreational lands.

e. Waterfront Recreational Facilities

Boat ramps, public landings, and bridges shall be designed, constructed, and maintained to provide points of water access when and where practicable.

This project does not involve the design, construction, or maintenance of any boat ramps, public landings, or bridges; however, the dredging of the NOAA MOC-A approach and berthing area will help to maintain access to waterways through these waterfront recreational facilities.

f. Waterfront Historic Properties

The Commonwealth has a long history of settlement and development, and much of that history has involved both shorelines and near-shore areas. The protection and preservation of historic shorefront properties is primarily the responsibility of the Virginia Department of Historic Resources.

This project will not affect historic properties or their viewshed. The National Historic Preservation Act - Section 106 consultation with the Department of Historic Resources (VDHR) has been completed. VDHR concurred with the 'no effect' conclusion.

Determination

Based upon the following information, data, and analysis, the U.S. Army Corps of Engineers, Norfolk District finds that the maintenance and new work dredging of the approach and berthing areas at NOAA MOC-A in Norfolk, Virginia is consistent to the maximum extent practicable with the enforceable policies of the Virginia Coastal Resources Management Program.

Pursuant to 15 CFR Section 930.41, the Virginia Coastal Resources Management Program 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 section 930.41(b). Virginia's concurrence will be presumed if its response is not received by the U.S. Army Corps of Engineers on the 60th day from receipt of this determination.

1/22/13
Date

Elizabeth G. Waring
Elizabeth G. Waring
Chief, Operations Branch

**Clean Air Act – General Conformity Rule
Record of Non-Applicability
for the National Oceanic and Atmospheric Administration
Marine Operations Center-Atlantic (NOAA MOC-A) Approach and Berthing Areas
Dredging Project at the
NOAA MOC-A Facility located in Norfolk, Virginia**

The Clean Air Act as amended requires Federal actions to conform to an approved state implementation plan (SIP) designed to achieve or maintain an attainment designation for air pollutants as defined by the National Ambient Air Quality Standard (NAAQS). The General Conformity Rule (40 CFR Parts 51 and 93) implements these requirements for actions occurring in air quality nonattainment areas.

The NOAA MOC-A project site is located in the Air Quality Control Region (AQCR) known as Hampton Roads Intrastate ACQR in Virginia (42 CFR 481.93). This region is in attainment for all the NAAQSSs.

The proposed maintenance and new work dredging for the NOAA MOC-A facility in Norfolk, Virginia will provide a maintained depth of -25ft mean lower low water (MLLW) in the approach and berthing area. The project site, approximately 9.4 acres, will be hydraulically or mechanically dredged, and the dredged material will be placed in the Craney Island Dredged Material Management Area (CIDMMA). Material will be transported to CIDMMA by hydraulic pipeline if hydraulically dredged or by barge/scow if mechanically dredged. Approximately 135,000 cubic yards of material will be removed from the approach and berthing areas (see Environmental Assessment Section 2 Project Description).

Previous maintenance dredging occurred in the 1960s and was conducted to a maximum depth of -20ft MLLW. The additional -5ft to be removed in the upcoming cycle is new work to allow adequate draft and keel clearance. The maintained depth of -25ft MLLW is needed for NOAA MOC-A to be fully able to support regional missions and operations.

The Environmental Protection Agency (EPA) has ruled that some Federal actions are exempt from the conformity requirement, as these actions have been determined to result in no emission increase or an increase that is clearly *de minimis*.

To the best of my knowledge the information provided is correct and accurate and I concur in the finding that the proposed action meets the exemptions stated above and thus will conform to the SIP.

1/22/13
Date

Elizabeth G. Waring
Elizabeth G. Waring
Chief, Operations Branch

APPENDIX C

Clean Water Act 404(b)1

Final Evaluation of 404(b)(1) Guidelines

Contained in Vol. 45 No. 249 of the
Federal Register dated 24 December 1980

National Oceanic and Atmospheric Administration Marine Operations-Atlantic
(NOAA MOC-A) Approach and Berthing Areas Dredging Project
January 2013

1. Technical Evaluation Factors

a. Physical and Chemical Characteristics of the Aquatic Ecosystem (230.20-230.25)(Subpart C)

	N/A	Not Significant	Significant
(1) Substrate impacts	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(2) Suspended particulates/turbidity impacts	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(3) Water Quality Control	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(4) Alteration of current patterns and water circulation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(5) Alteration of normal water fluctuations/hydroperiod	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(6) Alteration of salinity gradients	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Dredging operations will increase turbidity at the dredging location, but this will be a minor, short-term impact that will dissipate once dredging has ceased.

b. Biological Characteristics of the Aquatic Ecosystem (230.30-230.32) (Subpart D)

	N/A	Not Significant	Significant
(1) Effect on threatened/endangered species and their habitat	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(2) Effect on the aquatic food web	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(3) Effect on other wildlife (mammals, birds, reptiles, and amphibians)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Based on a search of Virginia's endangered species database and coordination with the U.S. Fish and Wildlife Service and National Marine Fisheries Service, the project will not affect any federally or state listed threatened or endangered species.

c. Special Aquatic Site (230.40-230.45) (Subpart E)

	N/A	Not Significant	Significant
(1) Sanctuaries and refuges	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) Wetlands	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(3) Mud flats	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(4) Vegetated shallows	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(5) Coral reefs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(6) Riffle and pool complexes

Dredging operations and the proposed discharge of dredged material will not affect any special aquatic sites.

d. Human Use Characteristics (230.50-230.54) (Subpart F)

	N/A	Not Significant	Significant
(1) Effects on municipal and private water supplies	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) Recreational and Commercial fisheries impacts	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(3) Effects on water-related recreation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(4) Aesthetic impacts	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(5) Effects on parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Evaluation of Dredged or Fill Material (230.60) (Subpart G)

a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. **(Check only those appropriate)**

- (1) Physical characteristics
- (2) Hydrography in relation to known or anticipated sources of contaminants
- (3) Results from previous testing of the material in the vicinity of the project
- (4) Known, significant, sources of persistent pesticides from land runoff or percolation
- (5) Spill records for petroleum products or designated (Section 311 of CWA) hazardous substances
- (6) Other public records of significant introduction of contaminants from industries, municipalities or other sources
- (7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge
- (8) Other sources (specify)

List appropriate references and a brief of supportive evidence.

Sediment and water samples will be collected and tested for potential contaminations; however, the Corps has no reason to suspect contamination levels (if present) will be unacceptable for placement at CIDMMA.

b. An evaluation of the appropriate information in 2a above indicated that there is reason to believe the proposed dredged or fill material is not a carrier of contaminants, of that levels of contaminants are substantively similar at extraction and disposal sites and not likely to exceed constraints. The material meets the testing exclusion criteria.

YES NO

3. Disposal Site Delineation (Section 230.11(f))

a. The following factors, as appropriate, have been considered in evaluating the disposal site.

- (1) Depth of water at disposal site
- (2) Current velocity, direction, and variability at disposal site
- (3) Degree of turbulence
- (4) Water volume stratification
- (5) Discharge vessel speed and direction
- (6) Rate of discharge
- (7) Dredged material characteristics (constituents, amount, and type of material, settling velocities)
- (8) Number of discharges per unit of time
- (9) Other factors affecting rates and patterns of mixing (specify)

List appropriate references.

- b. An evaluation of the appropriate factors in 4a above indicates that the disposal site and/or size of mixing zone are acceptable.

YES NO

4. Actions to Minimize Adverse Effects (Section 230.70-230.77)(Subpart H)

All appropriate and practicable steps have been taken, through application of recommendation of Section 230.70-230.77 to ensure minimal adverse effects of the proposed discharge. List actions taken.

YES NO

5. Factual Determination (Section 230.11)

A review of appropriate information as identified in items 2-5 above indicates that there is minimal potential for short or long-term environmental effects of the proposed discharge as related to:

- a. Physical substrate at the disposal site (review sections 2a, 3, 4, & 5)
- b. Water circulation, fluctuation & salinity (review sections 2a 3, 4, & 5)
- c. Suspended particulates/turbidity (review sections 2a, 3, 4, & 5)
- d. Contaminant availability (review sections 2a, 3, & 4)
- e. Aquatic ecosystem structure and function (review sections 2b, c; 3, & 5)
- f. Disposal site (review sections 2, 4, & 5)
- g. Cumulative impact on the aquatic ecosystem
- h. Secondary impacts on the aquatic ecosystem

6. Review of Compliance (230.10(a)-(d) (Subpart B)

A review of the permit application indicates that:

- a. The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic purpose (if no, see section 2 and information gathered for EA alternative);

YES NO

- b. The activity does not appear to 1) violate applicable state water quality standards or effluent standards prohibited under Section 307 of the CWA; 2) jeopardize the existence of Federally designated marine sanctuary (if no, see section 2b and check responses from resource and water quality certifying agencies;

YES NO

- c. The activity will not cause or contribute to significant degradation of waters of the U.S. including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values (if no, see section 2);

YES NO

- d. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (if no, see section 5);

YES NO

The proposed discharge of dredged material is the least environmentally damaging, practicable alternative and meets the Federal Standard.

7. Findings

- a. The proposed disposal site for discharge of dredged or fill material complies with the Section 404 (b)(1) guidelines
- b. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines with the inclusion of the following conditions:
- c. The proposed disposal site for discharge of dredged or fill material does not comply with the Section 404(b)(1) guidelines for the following reason(s):

- (1) There is a less damaging practicable alternative
- (2) The proposed discharge will result in significant degradation of the aquatic ecosystem
- (3) The proposed discharge does not include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem

1/22/13
DATE

Elizabeth G. Waring
Elizabeth G. Waring
Chief, Operations Branch

APPENDIX D

Threatened and Endangered Species Lists

Natural Heritage Resources by County

Your Search Criteria:

Norfolk (City)

Taxonomic Group:

Search run: 10-12-2012

Click highlighted scientific names below to go to NatureServe report. [Search Menu](#)

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Last Year Observed
Norfolk (City)						
BIRDS						
Falco peregrinus	Peregrine Falcon	G4	S1B,S2N		LT	1998
Nyctanassa violacea	Yellow-crowned Night-heron	G5	S2S3B,S3N			1995
Rynchops niger	Black Skimmer	G5	S2B,S1N			2010
Sternula antillarum	Least Tern	G4	S2B			1989
VASCULAR PLANTS						
Cuscuta indecora	Pretty Dodder	G5	S2?			1984
Iva imbricata	Sea-coast Marsh-elder	G5?	S1S2			1898
Quercus hemisphaerica	Darlington's Oak	G5	S1			2003
Solidago tortifolia	A Goldenrod	G4G5	S1			1968
Tillandsia usneoides	Spanish Moss	G5	S2			1969

Note: On-line queries provide basic information from DCR's databases at the time of the request. They are NOT to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.

Need Additional Information? For more detailed information on locations of Natural Heritage Resources submit an [information request](#).

Want to Contribute? If you have information on locations of natural heritage resources, please fill out and submit a [rare species sighting form](#)

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Return to the [Database Search page](#)



U.S. Fish and Wildlife Service

Natural Resources of Concern

This resource list is to be used for planning purposes only — it is not an official species list.

Endangered Species Act species list information for your project is available online and listed below for the following FWS Field Offices:

VIRGINIA ECOLOGICAL SERVICES FIELD OFFICE
6669 SHORT LANE
GLOUCESTER, VA 23061
(804) 693-6694
<http://www.fws.gov/northeast/virginiafield/>

Project Name:

NOAA MOC-A

Project Counties:

Norfolk, VA

Project Type:

Dredge / Excavation

Endangered Species Act Species List

There are a total of 1 species in your species list

Species that may be affected by your project:

Birds			
Piping Plover (<i>Charadrius melodus</i>) Population: except Great Lakes watershed	Threatened	species info	Virginia Ecological Services Field Office



U.S. Fish and Wildlife Service

Natural Resources of Concern

FWS National Wildlife Refuges

There are no refuges found within the vicinity of your project.

FWS Migratory Birds

Not yet available through IPaC.

FWS Delineated Wetlands

Not yet available through IPaC.

- [Commonwealth of Virginia](#)
- [Governor](#)
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- [Virginia Department of Game and Inland Fisheries](#)
- [Fish and Wildlife Information Service](#)
- [Home](#)
- »
- [Species Information](#)
- »
- VaFWIS Report BOVA

445 Species Booklets for Fish, Amphibians, Reptiles, Birds, Mammals, Mollusks, Other Aquatic Invertebrates, Terrestrial Invertebrates, Marine Mammals in (710) Norfolk City

[Help](#)

A Species Booklet Pop-up Window is opened when you click on any common name.
Table is currently ordered by Status importance * - Click another column header to sort by that column.

Species Code	Status *	WAP **	Common Name	Scientific Name
010032	FE	II	Sturgeon, Atlantic	<i>Acipenser oxyrinchus</i>
030073	FESE		Turtle, hawksbill sea	<i>Eretmochelys imbricata</i>
030074	FESE		Turtle, Kemp's ridley sea	<i>Lepidochelys kempii</i>
030075	FESE		Turtle, leatherback sea	<i>Dermochelys coriacea</i>
030071	FTST	I	Turtle, loggerhead sea	<i>Caretta caretta</i>
040120	FTST	I	Plover, piping	<i>Charadrius melodus</i>
030072	FTST		Turtle, green sea	<i>Chelonia mydas</i>
040096	ST	I	Falcon, peregrine	<i>Falco peregrinus</i>
040129	ST	I	Sandpiper, upland	<i>Bartramia longicauda</i>
040293	ST	I	Shrike, loggerhead	<i>Lanius ludovicianus</i>
040093	FSST	II	Eagle, bald	<i>Haliaeetus leucocephalus</i>
040292	ST		Shrike, migrant loggerhead	<i>Lanius ludovicianus migrans</i>
040144	FC	IV	Knot, red	<i>Calidris canutus rufus</i>
030067	CC	II	Terrapin, northern diamond-backed	<i>Malaclemys terrapin terrapin</i>
030063	CC	III	Turtle, spotted	<i>Clemmys guttata</i>
040110		I	Rail, black	<i>Laterallus jamaicensis</i>

040225		I	Sapsucker, yellow-bellied	<i>Sphyrapicus varius</i>
040319		I	Warbler, black-throated green	<i>Dendroica virens</i>
040038		II	Bittern, American	<i>Botaurus lentiginosus</i>
040052		II	Duck, American black	<i>Anas rubripes</i>
040029		II	Heron, little blue	<i>Egretta caerulea caerulea</i>
040105		II	Rail, king	<i>Rallus elegans</i>
040381		II	Sparrow, saltmarsh sharp-tailed	<i>Ammodramus caudacutus</i>
040186		II	Tern, least	<i>Sterna antillarum</i>
040187		II	Tern, royal	<i>Sterna maxima maximus</i>
040320		II	Warbler, cerulean	<i>Dendroica cerulea</i>
040266		II	Wren, winter	<i>Troglodytes troglodytes</i>
030068		III	Turtle, eastern box	<i>Terrapene carolina carolina</i>
040094		III	Harrier, northern	<i>Circus cyaneus</i>
040034		III	Heron, tricolored	<i>Egretta tricolor</i>
040040		III	Ibis, glossy	<i>Plegadis falcinellus</i>
040035		III	Night-heron, black-crowned	<i>Nycticorax nycticorax hoactii</i>
040036		III	Night-heron, yellow-crowned	<i>Nyctanassa violacea violacea</i>
040204		III	Owl, barn	<i>Tyto alba pratincola</i>
040062		III	Redhead	<i>Aythya americana</i>
040418		III	Sparrow, Nelson's sharp-tailed	<i>Ammodramus nelsoni</i>
040181		III	Tern, common	<i>Sterna hirundo</i>
040270		III	Wren, sedge	<i>Cistothorus platensis</i>
010131		IV	Eel, American	<i>Anguilla rostrata</i>
020010		IV	Frog, little grass	<i>Pseudacris ocularis</i>
020069		IV	Salamander, eastern mud	<i>Pseudotriton montanus montanus</i>
020034		IV	Salamander, many-lined	<i>Stereochilus marginatus</i>
020058		IV	Siren, greater	<i>Siren lacertina</i>
030009		IV	Lizard, eastern slender glass	<i>Ophisaurus attenuatus longicaudus</i>
030025		IV	Mudsnake, eastern	<i>Farancia abacura abacura</i>
030045		IV	Ribbonsnake, common	<i>Thamnophis sauritus sauritus</i>
030017		IV	Scarletsnake, northern	<i>Cemophora coccinea copei</i>
030058		IV	Slider, yellow-bellied	<i>Trachemys scripta scripta</i>
030046		IV	Snake, common rainbow	<i>Farancia erytrogramma erytrogramma</i>
030024		IV	Snake, eastern hog-nosed	<i>Heterodon platirhinos</i>
040100		IV	Bobwhite, northern	<i>Colinus virginianus</i>
040272		IV	Catbird, gray	<i>Dumetella carolinensis</i>
040337		IV	Chat, yellow-breasted	<i>Icteria virens virens</i>
040214		IV	Chuck-will's-widow	<i>Caprimulgus carolinensis</i>
040264		IV	Creeper, brown	<i>Certhia americana</i>

		IV	Cuckoo, yellow-billed	<i>Coccyzus americanus</i>
040142		IV	Dowitcher, short-billed	<i>Limnodromus griseus</i>
040126		IV	Godwit, marbled	<i>Limosa fedoa</i>
040005		IV	Grebe, horned	<i>Podiceps auritus</i>
040028		IV	Heron, green	<i>Butorides virescens</i>
040229		IV	Kingbird, eastern	<i>Tyrannus tyrannus</i>
040344		IV	Meadowlark, eastern	<i>Sturnella magna</i>
040263		IV	Nuthatch, brown-headed	<i>Sitta pusilla</i>
040330		IV	Ovenbird	<i>Seiurus aurocapilla</i>
040312		IV	Parula, northern	<i>Parula americana</i>
040243		IV	Pewee, eastern wood	<i>Contopus virens</i>
040106		IV	Rail, clapper	<i>Rallus longirostris crepitans</i>
040107		IV	Rail, Virginia	<i>Rallus limicola</i>
040153		IV	Sandpiper, purple	<i>Calidris maritima</i>
040065		IV	Scaup, greater	<i>Aythya marila</i>
040391		IV	Sparrow, field	<i>Spizella pusilla</i>
040378		IV	Sparrow, grasshopper	<i>Ammodramus savannarum pratensis</i>
040382		IV	Sparrow, seaside	<i>Ammodramus maritimus</i>
040248		IV	Swallow, northern rough-winged	<i>Stelgidopteryx serripennis</i>
040217		IV	Swift, chimney	<i>Chaetura pelagica</i>
040355		IV	Tanager, scarlet	<i>Piranga olivacea</i>
040180		IV	Tern, Forster's	<i>Sterna forsteri</i>
040273		IV	Thrasher, brown	<i>Toxostoma rufum</i>
040277		IV	Thrush, wood	<i>Hylocichla mustelina</i>
040375		IV	Towhee, eastern	<i>Pipilo erythrophthalmus</i>
040297		IV	Vireo, yellow-throated	<i>Vireo flavifrons</i>
040302		IV	Warbler, black-and-white	<i>Mniotilta varia</i>
040307		IV	Warbler, blue-winged	<i>Vermivora pinus</i>
040340		IV	Warbler, Canada	<i>Wilsonia canadensis</i>
040333		IV	Warbler, Kentucky	<i>Oporornis formosus</i>
040328		IV	Warbler, prairie	<i>Dendroica discolor</i>
040303		IV	Warbler, prothonotary	<i>Protonotaria citrea</i>
040305		IV	Warbler, worm-eating	<i>Helmitheros vermivorus</i>
040313		IV	Warbler, yellow	<i>Dendroica petechia</i>
040332		IV	Waterthrush, Louisiana	<i>Seiurus motacilla</i>
040215		IV	Whip-poor-will	<i>Caprimulgus vociferus</i>
040140		IV	Woodcock, American	<i>Scolopax minor</i>
040269		IV	Wren, marsh	<i>Cistothorus palustris</i>
050086		IV	Lemming, southern bog	<i>Synaptomys cooperi helaletes</i>

		IV	Mouse, cotton	<i>Peromyscus gossypinus gossypinus</i>
050107		IV	Rabbit, marsh	<i>Sylvilagus palustris palustris</i>
100004		IV	Butterfly, King's hairstreak	<i>Satyrium kingi</i>
010188			Bass, largemouth	<i>Micropterus salmoides</i>
010183			Bluegill	<i>Lepomis macrochirus</i>
010123			Bullhead, brown	<i>Ameiurus nebulosus</i>
010122			Bullhead, yellow	<i>Ameiurus natalis</i>
010062			Carp, common	<i>Cyprinus carpio</i>
010125			Catfish, channel	<i>Ictalurus punctatus</i>
010120			Catfish, white	<i>Ameiurus catus</i>
010190			Crappie, black	<i>Pomoxis nigromaculatus</i>
010366			Dace, rosyside	<i>Clinostomus funduloides</i>
010002			Lamprey, sea	<i>Petromyzon marinus</i>
010408			Minnow, eastern silvery	<i>Hybognathus regius</i>
010148			Mosquitofish, eastern	<i>Gambusia holbrooki</i>
010166			Perch, white	<i>Morone americana</i>
010206			Perch, yellow	<i>Perca flavescens</i>
010056			Pickerel, chain	<i>Esox niger</i>
010182			Pumpkinseed	<i>Lepomis gibbosus</i>
010041			Shad, gizzard	<i>Dorosoma cepedianum</i>
010068			Shiner, golden	<i>Notemigonus crysoleucas</i>
010185			Sunfish, redear	<i>Lepomis microlophus</i>
010216			Walleye	<i>Sander vitreus vitreus</i>
010177			Warmouth	<i>Lepomis gulosus</i>
020001			Amphiuma, two-toed	<i>Amphiuma means</i>
020004			Bullfrog, American	<i>Lithobates catesbeianus</i>
020003			Frog, Brimley's chorus	<i>Pseudacris brimleyi</i>
020015			Frog, coastal plain cricket	<i>Acris gryllus gryllus</i>
020008			Frog, northern green	<i>Lithobates clamitans melanota</i>
020016			Frog, southern leopard	<i>Lithobates sphenoccephalus utricularius</i>
020065			Newt, red-spotted	<i>Notophthalmus viridescens viridescens</i>
020071			Peeper, spring	<i>Pseudacris crucifer</i>
020084			Salamander, Atlantic Coast Slimy	<i>Plethodon chlorobryonis</i>
020043			Salamander, eastern red-backed	<i>Plethodon cinereus</i>
020029			Salamander, four-toed	<i>Hemidactylum scutatum</i>
020035			Salamander, marbled	<i>Ambystoma opacum</i>
020038			Salamander, northern dusky	<i>Desmognathus fuscus</i>
020048			Salamander, southern dusky	<i>Desmognathus auriculatus</i>
020050			Salamander, southern two-lined	<i>Eurycea cirrigera</i>

			Salamander, three-lined	<i>Eurycea guttolineata</i>
020060			Toad, eastern narrow-mouthed	<i>Gastrophryne carolinensis</i>
020062			Toad, Fowler's	<i>Anaxyrus fowleri</i>
020064			Toad, southern	<i>Anaxyrus terrestris</i>
020006			Treefrog, Cope's gray	<i>Hyla chrysoscelis</i>
020009			Treefrog, green	<i>Hyla cinerea</i>
020014			Treefrog, pine woods	<i>Hyla femoralis</i>
020017			Treefrog, squirrel	<i>Hyla squirella</i>
030041			Brownsnake, northern	<i>Storeria dekayi dekayi</i>
030057			Cooter, northern red-bellied	<i>Pseudemys rubriventris</i>
030016			Copperhead, northern	<i>Agkistrodon contortrix mokasen</i>
030015			Cottonmouth, eastern	<i>Agkistrodon piscivorus piscivorus</i>
030049			Earthsake, eastern smooth	<i>Virginia valeriae valeriae</i>
030047			Earthsake, rough	<i>Virginia striatula</i>
030044			Gartersnake, eastern	<i>Thamnophis sirtalis sirtalis</i>
030038			Greensnake, northern rough	<i>Opheodrys aestivus aestivus</i>
030026			Kingsnake, eastern	<i>Lampropeltis getula getula</i>
030002			Lizard, eastern fence	<i>Sceloporus undulatus</i>
030029			Milksnake, eastern	<i>Lampropeltis triangulum triangulum</i>
030018			Racer, northern black	<i>Coluber constrictor constrictor</i>
030008			Racerunner, eastern six-lined	<i>Aspidoscelis sexlineata sexlineata</i>
030023			Ratsnake, eastern	<i>Pantherophis alleghaniensis</i>
030006			Skink, broad-headed	<i>Plestiodon laticeps</i>
030004			Skink, common five-lined	<i>Plestiodon fasciatus</i>
030007			Skink, little brown	<i>Scincella lateralis</i>
030005			Skink, southeastern five-lined	<i>Plestiodon inexpectatus</i>
030042			Snake, northern red-bellied	<i>Storeria occipitomaculata occipitomaculata</i>
030020			Snake, northern ring-necked	<i>Diadophis punctatus edwardsii</i>
030021			Snake, southern ring-necked	<i>Diadophis punctatus punctatus</i>
030052			Turtle, eastern musk	<i>Sternotherus odoratus</i>
030060			Turtle, eastern painted	<i>Chrysemys picta picta</i>
030050			Turtle, snapping	<i>Chelydra serpentina</i>
030076			Turtle, striped mud	<i>Kinosternon baurii</i>
030037			Watersnake, brown	<i>Nerodia taxispilota</i>
030034			Watersnake, northern	<i>Nerodia sipedon sipedon</i>
030036			Watersnake, plain-bellied	<i>Nerodia erythrogaster</i>
030019			Wormsnake, eastern	<i>Carphophis amoenus amoenus</i>
040116			Avocet, American	<i>Recurvirostra americana</i>

040346		Blackbird, red-winged	<i>Agelaius phoeniceus</i>
040282		Bluebird, eastern	<i>Sialia sialis</i>
040068		Bufflehead	<i>Bucephala albeola</i>
040361		Bunting, indigo	<i>Passerina cyanea</i>
040362		Bunting, Lazuli	<i>Passerina amoena</i>
040064		Canvasback	<i>Aythya valisineria</i>
040357		Cardinal, northern	<i>Cardinalis cardinalis</i>
040258		Chickadee, Carolina	<i>Poecile carolinensis</i>
040113		Coot, American	<i>Fulica americana</i>
040024		Cormorant, double-crested	<i>Phalacrocorax auritus</i>
040023		Cormorant, great	<i>Phalacrocorax carbo</i>
040353		Cowbird, brown-headed	<i>Molothrus ater</i>
040373		Crossbill, white-winged	<i>Loxia leucoptera</i>
040255		Crow, American	<i>Corvus brachyrhynchos</i>
040256		Crow, fish	<i>Corvus ossifragus</i>
040364		Dickcissel	<i>Spiza americana</i>
040198		Dove, mourning	<i>Zenaida macroura carolinensis</i>
040143		Dowitcher, long-billed	<i>Limnodromus scolopaceus</i>
040070		Duck, Harlequin	<i>Histrionicus histrionicus</i>
040069		Duck, long-tailed	<i>Clangula hyemalis</i>
040076		Duck, ruddy	<i>Oxyura jamaicensis</i>
040061		Duck, wood	<i>Aix sponsa</i>
040030		Egret, cattle	<i>Bubulcus ibis</i>
040032		Egret, great	<i>Ardea alba egretta</i>
040031		Egret, reddish	<i>Egretta rufescens rufescens</i>
040033		Egret, snowy	<i>Egretta thula</i>
040071		Eider, common	<i>Somateria mollissima</i>
040367		Finch, house	<i>Carpodacus mexicanus</i>
040366		Finch, purple	<i>Carpodacus purpureus</i>
040221		Flicker, northern	<i>Colaptes auratus</i>
040239		Flycatcher, Acadian	<i>Empidonax virescens</i>
040234		Flycatcher, great crested	<i>Myiarchus crinitus</i>
040053		Gadwall	<i>Anas strepera</i>
040284		Gnatcatcher, blue-gray	<i>Polioptila caerulea</i>
040067		Goldeneye, common	<i>Bucephala clangula americana</i>
040371		Goldfinch, American	<i>Carduelis tristis</i>
040045		Goose, Canada	<i>Branta canadensis</i>
040049		Goose, lesser snow	<i>Chen caerulescens caerulescens</i>
040410		Goose, snow	<i>Chen caerulescens</i>

		Grackle, boat-tailed	<i>Quiscalus major</i>
040352		Grackle, common	<i>Quiscalus quiscula</i>
040008		Grebe, pied-billed	<i>Podilymbus podiceps</i>
040004		Grebe, red-necked	<i>Podiceps grisegena</i>
040359		Grosbeak, black-headed	<i>Pheucticus melanocephalus</i>
040360		Grosbeak, blue	<i>Guiraca caerulea caerulea</i>
040365		Grosbeak, evening	<i>Coccothraustes vespertinus</i>
040165		Gull, great black-backed	<i>Larus marinus</i>
040167		Gull, herring	<i>Larus argentatus</i>
040173		Gull, laughing	<i>Larus atricilla</i>
040170		Gull, ring-billed	<i>Larus delawarensis</i>
040086		Hawk, Cooper's	<i>Accipiter cooperii</i>
040088		Hawk, red-shouldered	<i>Buteo lineatus lineatus</i>
040087		Hawk, red-tailed	<i>Buteo jamaicensis</i>
040090		Hawk, rough-legged	<i>Buteo lagopus johannis</i>
040085		Hawk, sharp-shinned	<i>Accipiter striatus velox</i>
040027		Heron, great blue	<i>Ardea herodias herodias</i>
040218		Hummingbird, ruby-throated	<i>Archilochus colubris</i>
040041		Ibis, white	<i>Eudocimus albus</i>
040252		Jay, blue	<i>Cyanocitta cristata</i>
040387		Junco, dark-eyed	<i>Junco hyemalis</i>
040098		Kestrel, American	<i>Falco sparverius sparverius</i>
040119		Killdeer	<i>Charadrius vociferus</i>
040220		Kingfisher, belted	<i>Ceryle alcyon</i>
040285		Kinglet, golden-crowned	<i>Regulus satrapa</i>
040286		Kinglet, ruby-crowned	<i>Regulus calendula</i>
040245		Lark, horned	<i>Eremophila alpestris</i>
040001		Loon, common	<i>Gavia immer</i>
040003		Loon, red-throated	<i>Gavia stellata</i>
040051		Mallard	<i>Anas platyrhynchos</i>
040251		Martin, purple	<i>Progne subis</i>
040078		Merganser, common	<i>Mergus merganser americanus</i>
040079		Merganser, red-breasted	<i>Mergus serrator serrator</i>
040271		Mockingbird, northern	<i>Mimus polyglottos</i>
040112		Moorhen, common	<i>Gallinula chloropus cachinnans</i>
040216		Nighthawk, common	<i>Chordeiles minor</i>
040262		Nuthatch, red-breasted	<i>Sitta canadensis</i>
040261		Nuthatch, white-breasted	<i>Sitta carolinensis</i>
040348		Oriole, Baltimore	<i>Icterus galbula</i>

		Oriole, orchard	<i>Icterus spurius</i>
040095		Osprey	<i>Pandion haliaetus carolinensis</i>
040209		Owl, barred	<i>Strix varia</i>
040206		Owl, great horned	<i>Bubo virginianus</i>
040211		Owl, short-eared	<i>Asio flammeus</i>
040020		Pelican, brown	<i>Pelecanus occidentalis carolinensis</i>
040236		Phoebe, eastern	<i>Sayornis phoebe</i>
040197		Pigeon, rock	<i>Columba livia</i>
040054		Pintail, northern	<i>Anas acuta acuta</i>
040287		Pipit, American	<i>Anthus rubescens</i>
040341		Redstart, American	<i>Setophaga ruticilla</i>
040275		Robin, American	<i>Turdus migratorius</i>
040145		Sanderling	<i>Calidris alba</i>
040149		Sandpiper, least	<i>Calidris minutilla</i>
040134		Sandpiper, spotted	<i>Actitis macularia</i>
040147		Sandpiper, western	<i>Calidris mauri</i>
040066		Scaup, lesser	<i>Aythya affinis</i>
040075		Scoter, black	<i>Melanitta nigra americana</i>
040074		Scoter, surf	<i>Melanitta perspicillata</i>
040205		Screech-owl, eastern	<i>Megascops asio</i>
040060		Shoveler, northern	<i>Anas clypeata</i>
040370		Siskin, pine	<i>Carduelis pinus</i>
040141		Snipe, Wilson's	<i>Gallinago delicata</i>
040108		Sora	<i>Porzana carolina</i>
040386		Sparrow, black-throated	<i>Amphispiza bilineata</i>
040389		Sparrow, chipping	<i>Spizella passerina</i>
040395		Sparrow, fox	<i>Passerella iliaca</i>
040342		Sparrow, house	<i>Passer domesticus</i>
040377		Sparrow, savannah	<i>Passerculus sandwichensis</i>
040398		Sparrow, song	<i>Melospiza melodia</i>
040397		Sparrow, swamp	<i>Melospiza georgiana</i>
040383		Sparrow, vesper	<i>Poocetes gramineus</i>
040393		Sparrow, white-crowned	<i>Zonotrichia leucophrys</i>
040394		Sparrow, white-throated	<i>Zonotrichia albicollis</i>
040294		Starling, European	<i>Sturnus vulgaris</i>
040249		Swallow, barn	<i>Hirundo rustica</i>
040044		Swan, tundra	<i>Cygnus columbianus columbianus</i>
040356		Tanager, summer	<i>Piranga rubra</i>
040354		Tanager, western	<i>Piranga ludoviciana</i>

		Teal, blue-winged	<i>Anas discors orphna</i>
040056		Teal, green-winged	<i>Anas crecca carolinensis</i>
040189		Tern, Caspian	<i>Sterna caspia</i>
040188		Tern, sandwich	<i>Sterna sandvicensis acuflavidus</i>
040278		Thrush, hermit	<i>Catharus guttatus</i>
040260		Titmouse, tufted	<i>Baeolophus bicolor</i>
040135		Turnstone, ruddy	<i>Arenaria interpres morinella</i>
040281		Veery	<i>Catharus fuscescens</i>
040298		Vireo, blue-headed	<i>Vireo solitarius</i>
040299		Vireo, red-eyed	<i>Vireo olivaceus</i>
040295		Vireo, white-eyed	<i>Vireo griseus</i>
040081		Vulture, black	<i>Coragyps atratus</i>
040080		Vulture, turkey	<i>Cathartes aura</i>
040324		Warbler, bay-breasted	<i>Dendroica castanea</i>
040316		Warbler, black-throated blue	<i>Dendroica caerulescens</i>
040325		Warbler, blackpoll	<i>Dendroica striata</i>
040323		Warbler, chestnut-sided	<i>Dendroica pensylvanica</i>
040338		Warbler, hooded	<i>Wilsonia citrina</i>
040314		Warbler, magnolia	<i>Dendroica magnolia</i>
040311		Warbler, Nashville	<i>Vermivora ruficapilla</i>
040329		Warbler, palm	<i>Dendroica palmarum</i>
040326		Warbler, pine	<i>Dendroica pinus</i>
040317		Warbler, yellow-rumped	<i>Dendroica coronata cornata</i>
040331		Waterthrush, northern	<i>Seiurus noveboracensis</i>
040290		Waxwing, cedar	<i>Bombycilla cedrorum</i>
040059		Wigeon, American	<i>Anas americana</i>
040058		Wigeon, Eurasian	<i>Anas penelope</i>
040133		Willet	<i>Catoptrophorus semipalmatus semipalmatus</i>
040227		Woodpecker, downy	<i>Picoides pubescens medianus</i>
040226		Woodpecker, hairy	<i>Picoides villosus</i>
040222		Woodpecker, pileated	<i>Dryocopus pileatus</i>
040223		Woodpecker, red-bellied	<i>Melanerpes carolinus</i>
040224		Woodpecker, red-headed	<i>Melanerpes erythrocephalus</i>
040268		Wren, Carolina	<i>Thryothorus ludovicianus</i>
040265		Wren, house	<i>Troglodytes aedon</i>
040336		Yellowthroat, common	<i>Geothlypis trichas</i>
050028		Bat, big brown	<i>Eptesicus fuscus fuscus</i>
050029		Bat, eastern red	<i>Lasiurus borealis borealis</i>

050033		Bat, evening	<i>Nycticeius humeralis humeralis</i>
050030		Bat, hoary	<i>Lasiurus cinereus cinereus</i>
050109		Bat, northern yellow	<i>Lasiurus intermedius floridanus</i>
050025		Bat, silver-haired	<i>Lasionycteris noctivagans</i>
050069		Beaver, American	<i>Castor canadensis</i>
050055		Chipmunk, Fisher's eastern	<i>Tamias striatus fisheri</i>
050103		Cottontail, eastern	<i>Sylvilagus floridanus mallurus</i>
050125		Coyote	<i>Canis latrans</i>
050108		Deer, white-tailed	<i>Odocoileus virginianus</i>
050050		Fox, common gray	<i>Urocyon cinereoargenteus cinereoargenteus</i>
050049		Fox, red	<i>Vulpes vulpes fulva</i>
050042		Mink, common	<i>Mustela vison mink</i>
050017		Mole, eastern	<i>Scalopus aquaticus aquaticus</i>
050074		Mouse, common white-footed	<i>Peromyscus leucopus leucopus</i>
050098		Mouse, house	<i>Mus musculus musculus</i>
050076		Mouse, Lewis' golden	<i>Ochrotomys nuttalli nuttalli</i>
050099		Mouse, meadow jumping	<i>Zapus hudsonius americanus</i>
050093		Muskrat, large-toothed	<i>Ondatra zibethicus macrodon</i>
050022		Myotis, northern	<i>Myotis septentrionalis septentrionalis</i>
050053		Nutria	<i>Myocastor coypus</i>
050001		Opossum, Virginia	<i>Didelphis virginiana virginiana</i>
050045		Otter, northern river	<i>Lontra canadensis lataxina</i>
050027		Pipistrelle, eastern	<i>Pipistrellus subflavus subflavus</i>
050038		Raccoon	<i>Procyon lotor lotor</i>
050094		Rat, black	<i>Rattus rattus rattus</i>
050079		Rat, hispid cotton	<i>Sigmodon hispidus virginianus</i>
050078		Rat, marsh rice	<i>Oryzomys palustris palustris</i>
050095		Rat, Norway	<i>Rattus norvegicus norvegicus</i>
050015		Shrew, least	<i>Cryptotis parva parva</i>
050010		Shrew, pygmy	<i>Sorex hoyi winnemana</i>
050007		Shrew, southeastern	<i>Sorex longirostris longirostris</i>
050011		Shrew, southern short-tailed	<i>Blarina carolinensis carolinensis</i>
050047		Skunk, striped	<i>Mephitis mephitis nigra</i>
050057		Squirrel, eastern gray	<i>Sciurus carolinensis carolinensis</i>
050065		Squirrel, southern flying	<i>Glaucomys volans volans</i>
050083		Vole, dark meadow	<i>Microtus pennsylvanicus nigrans</i>
050091		Vole, pine	<i>Microtus pinetorum scalopsoides</i>
050041		Weasel, long-tailed	<i>Mustela frenata noveboracensis</i>

060025			Mussel, eastern elliptio	<i>Elliptio complanata</i>
070126			Crayfish, Digger	<i>Fallicambarus fodiens</i>
070094			Crayfish, no common name	<i>Cambarus acuminatus</i>
070120			Crayfish, White River	<i>Procambarus acutus</i>
100043			Armyworm	<i>Pseudaletia unipuncta</i>
100041			Borer, European corn	<i>Ostrinia nubilatis</i>
100181			Butterfly, Aaron's skipper	<i>Poanes aaroni</i>
100262			Butterfly, American lady	<i>Vanessa virginianensis</i>
100232			Butterfly, banded hairstreak	<i>Satyrrium calanus</i>
100092			Butterfly, black swallowtail	<i>Papilio polyxenes asterius</i>
100196			Butterfly, Brazilian skipper	<i>Calpodetes ethlius</i>
100179			Butterfly, broad-winged skipper	<i>Poanes viator</i>
100137			Butterfly, brown elfin	<i>Callophrys augustinus</i>
100205			Butterfly, cabbage white	<i>Pieris rapae</i>
100189			Butterfly, Carolina road-skipper	<i>Amblyscirtes carolina</i>
100159			Butterfly, clouded skipper	<i>Lerema accius</i>
100094			Butterfly, clouded sulphur	<i>Colias philodice</i>
100213			Butterfly, cloudless sulphur	<i>Phoebis sennae eubule</i>
100265			Butterfly, common buckeye	<i>Junonia coenia</i>
100156			Butterfly, common checkered-skipper	<i>Pyrgus communis</i>
100157			Butterfly, common sootywing	<i>Pholisora catullus</i>
100277			Butterfly, common wood-nymph	<i>Cercyonis pegala</i>
100144			Butterfly, confused cloudywing	<i>Thorybes confusus</i>
100168			Butterfly, crossline skipper	<i>Polites origenes</i>
100177			Butterfly, Delaware skipper	<i>Anatrytone logan</i>
100184			Butterfly, Dion skipper	<i>Euphyes dion</i>
100185			Butterfly, Dun skipper	<i>Euphyes vestris</i>
100258			Butterfly, eastern comma	<i>Polygonia comma</i>
100238			Butterfly, eastern tailed-blue	<i>Everes comyntas</i>
100093			Butterfly, eastern tiger swallowtail	<i>Papilio glaucus</i>
100162			Butterfly, fiery skipper	<i>Hylephila phyleus</i>
100276			Butterfly, gemmed satyr	<i>Cyllopsis gemma</i>
100228			Butterfly, gray hairstreak	<i>Strymon melinus</i>
100222			Butterfly, great purple hairstreak	<i>Atlides halesus</i>
100246			Butterfly, gulf fritillary	<i>Agraulis vanillae nigrior</i>
100145			Butterfly, Hayhurst's scallopwing	<i>Staphylus hayhurstii</i>
100141			Butterfly, hoary edge	<i>Achalarus lyciades</i>
100149			Butterfly, Horace's duskywing	<i>Erynnis horatius</i>

100148			Butterfly, Juvenal's duskywing	<i>Erynnis juvenalis</i>
100191			Butterfly, lace-winged road-skipper	<i>Amblyscirtes aesculapius</i>
100160			Butterfly, least skipper	<i>Ancyloxypha numitor</i>
100175			Butterfly, little glassywing	<i>Pompeius verna</i>
100140			Butterfly, long-tailed skipper	<i>Urbanus proteus</i>
100079			Butterfly, monarch	<i>Danaus plexippus</i>
100173			Butterfly, northern broken dash	<i>Wallengrenia egeremet</i>
100143			Butterfly, northern cloudywing	<i>Thorybes pylades</i>
100197			Butterfly, Ocola skipper	<i>Panoquina ocola</i>
100211			Butterfly, orange sulphur	<i>Colias eurytheme</i>
100263			Butterfly, painted lady	<i>Vanessa cardui</i>
100203			Butterfly, Palamedes swallowtail	<i>Papilio palamedes</i>
100200			Butterfly, pipevine swallowtail	<i>Battus philenor</i>
100259			Butterfly, question mark	<i>Polygonia interrogationis</i>
100264			Butterfly, red admiral	<i>Vanessa atalanta</i>
100235			Butterfly, red-banded hairstreak	<i>Calycopis cecrops</i>
100268			Butterfly, red-spotted purple	<i>Limenitis arthemis astyanax</i>
100190			Butterfly, reversed road-skipper	<i>Amblyscirtes reversa</i>
100174			Butterfly, sachem	<i>Atalopedes campestris</i>
100198			Butterfly, salt marsh skipper	<i>Panoquina panoquin</i>
100082			Butterfly, silver-spotted skipper	<i>Epargyreus clarus</i>
100146			Butterfly, sleepy duskywing	<i>Erynnis brizo</i>
100216			Butterfly, sleepy orange	<i>Eurema nicippe</i>
100172			Butterfly, southern broken dash	<i>Wallengrenia otho</i>
100142			Butterfly, southern cloudywing	<i>Thorybes bathyllus</i>
100202			Butterfly, spicebush swallowtail	<i>Papilio troilus</i>
100239			Butterfly, spring azure	<i>Celastrina ladon</i>
100158			Butterfly, swarthy skipper	<i>Nastra lherminier</i>
100247			Butterfly, variegated fritillary	<i>Euptoieta claudia</i>
100266			Butterfly, viceroy	<i>Limenitis archippus</i>
100227			Butterfly, white M hairstreak	<i>Parrhasius m-album</i>
100182			Butterfly, Yehl skipper	<i>Poanes yehl</i>
100180			Butterfly, Zabulon skipper	<i>Poanes zabulon</i>
100151			Butterfly, Zarucco duskywing	<i>Erynnis zarucco</i>
100042			Earworm, corn	<i>Heliathis zea</i>
100040			Moth, codling	<i>Cydia pomonella</i>
100047			Moth, gypsy	<i>Lymantria dispar</i>
100289			Moth, pinkstriped oakworm	<i>Anisota virginicensis</i>
110230			Tick, American dog	<i>Dermacentor variabilis</i>

			Tick, brown dog	<i>Rhipicephalus sanguineus</i>
110228			Tick, lone star	<i>Amblyomma americanum</i>
110231			Tick, rabbit	<i>Haemaphysalis leporispalustris</i>
110229			Tick, winter	<i>Dermacentor albipictus</i>
<p>* FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; FS=Federal Species of Concern; CC=Collection Concern</p> <p>** I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need</p> <p>List completeness is dependent on a search for published scientific records of which there may be many naming counties but few for other area types.</p>				

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- Site tested using browsers Chrome 10+, Firefox 2+, IE 6+, Opera 9+, and Safari 4+ (FWISWEB1 October 12, 2012 4:17:32PM Visitor Visitor 430895)
- W3C HTML [validation](#) <BASE href="http://vafwis.org/fwis/NewPages/">[VaFWIS report bova.asp](#)

APPENDIX E

Location of Utilities at NOAA MOC-A Facility

LEGEND & ABBREVIATIONS (THIS DRAWING ONLY):

A/C = AIR CONDITIONER	E	OVERHEAD ELECTRIC
BBG = BASKETBALL GOAL	T	OVERHEAD TELEPHONE
BM = BENCH MARK	TV	OVERHEAD TELEVISION
BP = BUMPER POST	E/TV	OVERHEAD ELECTRIC & TELEVISION
BV= BRICK VENEER	G	UNDERGROUND GAS
CBL = CINDER BLOCK	UGE	UNDERGROUND ELECTRIC
CL = CENTERLINE	UGT	UNDERGROUND TELEPHONE
CLF = CHAIN LINK FENCE	16" F-W	16" WATER (FRESH)
CONC. = CONCRETE	16" S-W	16" WATER (SALT)
DH = DRILL HOLE	12" S	12" SANITARY SEWER
EL = ELEVATION	12" RCP	12" STORM DRAIN (NEEDS NO REPAIR)
EP = ELECTRICAL PANEL		
(F) = FOUND		
FF = FINISHED FLOOR		
FH = FIRE HYDRANT		
FR = FRAME		
GM = GAS METER		
GV = GAS VALVE		
INV = INVERT		
MH = MANHOLE		
PED. = PEDESTAL		
PA = PANEL AREA		
P/P = POWER POLE		
RD = ROOF DRAIN		
(S) = SET		
SCO = SANITARY CLEANOUT		
STY = STORY		
TBM = TEMPORARY BENCH MARK		
TEL. = TELEPHONE		
TRANSF. = TRANSFORMER		
TYP. = TYPICAL		
US = UTILITY STATION		
W/ = WITH		
WI = WROUGHT IRON		
WM = WATER METER		
WV = WATER VALVE		
WPF = WOOD PRIVACY FENCE		
VP = VENT PIPE		
YD = YARD DRAIN		

GENERAL NOTES (THIS DRAWING ONLY):

1. THIS SURVEY DOES NOT GUARANTEE THE EXISTENCE, SIZE OR HORIZONTAL LOCATION OF ANY UNDERGROUND UTILITIES. THE UNDERGROUND UTILITIES SHOWN ON THIS SURVEY WERE ESTABLISHED USING ABOVE GROUND STRUCTURES (VALVES, MANHOLES, ETC) AND AVAILABLE UTILITY MAPS OBTAINED FROM UTILITY COMPANIES AND LOCAL GOVERNMENTAL AGENCIES. NO GUARANTEE IS MADE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED.

2. COORDINATES SHOWN HEREON ARE IN FEET AND REFERENCED TO VIRGINIA STATE PLANE COORDINATES, NORTH AMERICAN DATUM 1983 (NAD 83).

3. ELEVATIONS SHOWN HEREON ARE IN FEET AND REFERENCED TO NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88).

BENCH MARK:

BM "BOLE" IS A USC & GS DISK LOCATED NEAR THE SOUTHWEST CORNER OF THE NOAA FACILITY.
EL = 7.69

BM "BOLE RM-2" IS A USC & GS DISK LOCATED NEAR THE SOUTHWEST CORNER OF THE PIER AT THE NOAA FACILITY.
EL = 7.74

4. SITE TEMPORARY BENCH MARKS ARE SHOWN THUS:

TBM "USC & GS" IS A TIDAL BENCH MARK DISK LOCATED ALONG THE WESTERN PIER LINE AT THE NOAA FACILITY.
EL = 8.02

TBM "GUARD" IS A "D" SET AT THE SOUTHWEST CORNER OF A CONCRETE PAD AT THE GUARD SHACK.
EL = 7.47

5. THE PROPERTY SHOWN HEREON APPEARS TO FALL INSIDE ZONE A6 (EL 9) (AREAS OF 100-YEAR FLOOD) AND B (AREAS BETWEEN LIMITS OF 100-YEAR AND 500-YEAR FLOOD) AS SHOWN ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD HAZARD MAP FOR THE CITY OF NORFOLK, VIRGINIA, COMMUNITY PANEL NO. 510104 0017 D, EFFECTIVE DATE: APRIL 17, 1984. FLOOD ZONE DETERMINATION IS BASED ON THE FLOOD INSURANCE RATE MAPS AND DOES NOT IMPLY THAT THIS PROPERTY WILL OR WILL NOT BE FREE FROM FLOODING OR DAMAGE. CONTACT LOCAL COMMUNITY FLOOD OFFICIAL TO CONFIRM THE ABOVE INFORMATION. FLOOD ZONE INFORMATION WAS SCALED FROM FEMA FLOOD MAPS. BALDWIN & GREGG, LTD IS NOT A PARTY IN DETERMINING THE REQUIREMENTS FOR FLOOD INSURANCE ON THE PROPERT

6. TOPOGRAPHIC SURVEY PROVIDED BY BALDWIN & GREGG, LTD
221 W. BUTE STREET NORFOLK, VIRGINIA 23510-1401
PHONE: 757-623-7300, FAX 757-622-4665

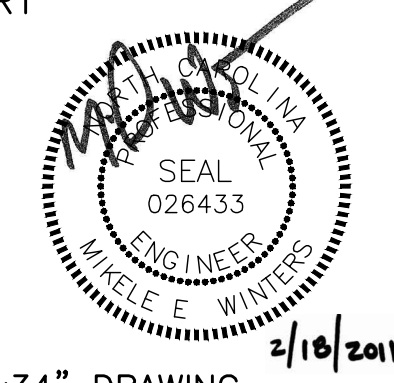


MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: M. SMILEK	CHECKED BY: M. WATERS	DATE: FEBRUARY 2011	FILE NO.:
DRAWN BY: N. SMILEK	APPROVED BY: M. WATERS	SCALE: AS SHOWN	MAP NO.:
PROJECT: NOAA MARINE OPERATIONS CENTER WATERFRONT BULKHEAD REPAIRS	SUBMITTED BY: AMERICAN BRIDGE	PLOT DATE: 2011/02/17	XXXX
NOAA MARINE OPERATIONS CENTER WATERFRONT BULKHEAD REPAIRS	NOAA MARINE OPERATIONS CENTER WATERFRONT BULKHEAD REPAIRS	NOAA MARINE OPERATIONS CENTER WATERFRONT BULKHEAD REPAIRS	NOAA MARINE OPERATIONS CENTER WATERFRONT BULKHEAD REPAIRS

NOAA MARINE OPERATIONS CENTER
WATERFRONT BULKHEAD REPAIRS
NOVA/VA
UTILITY SUBMITTAL
EXISTING SITE PLAN

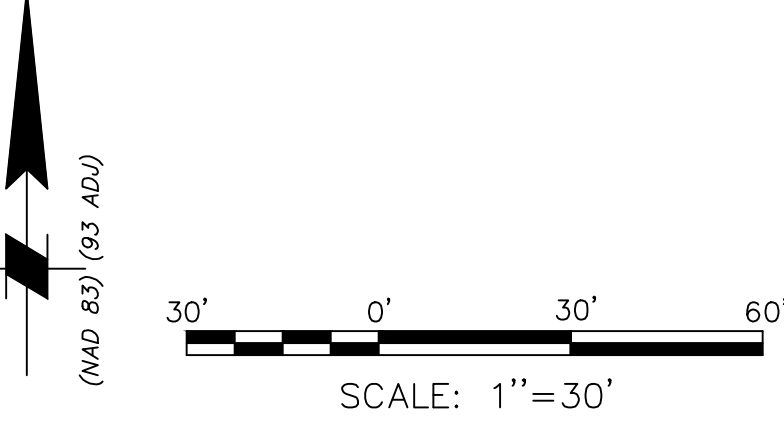
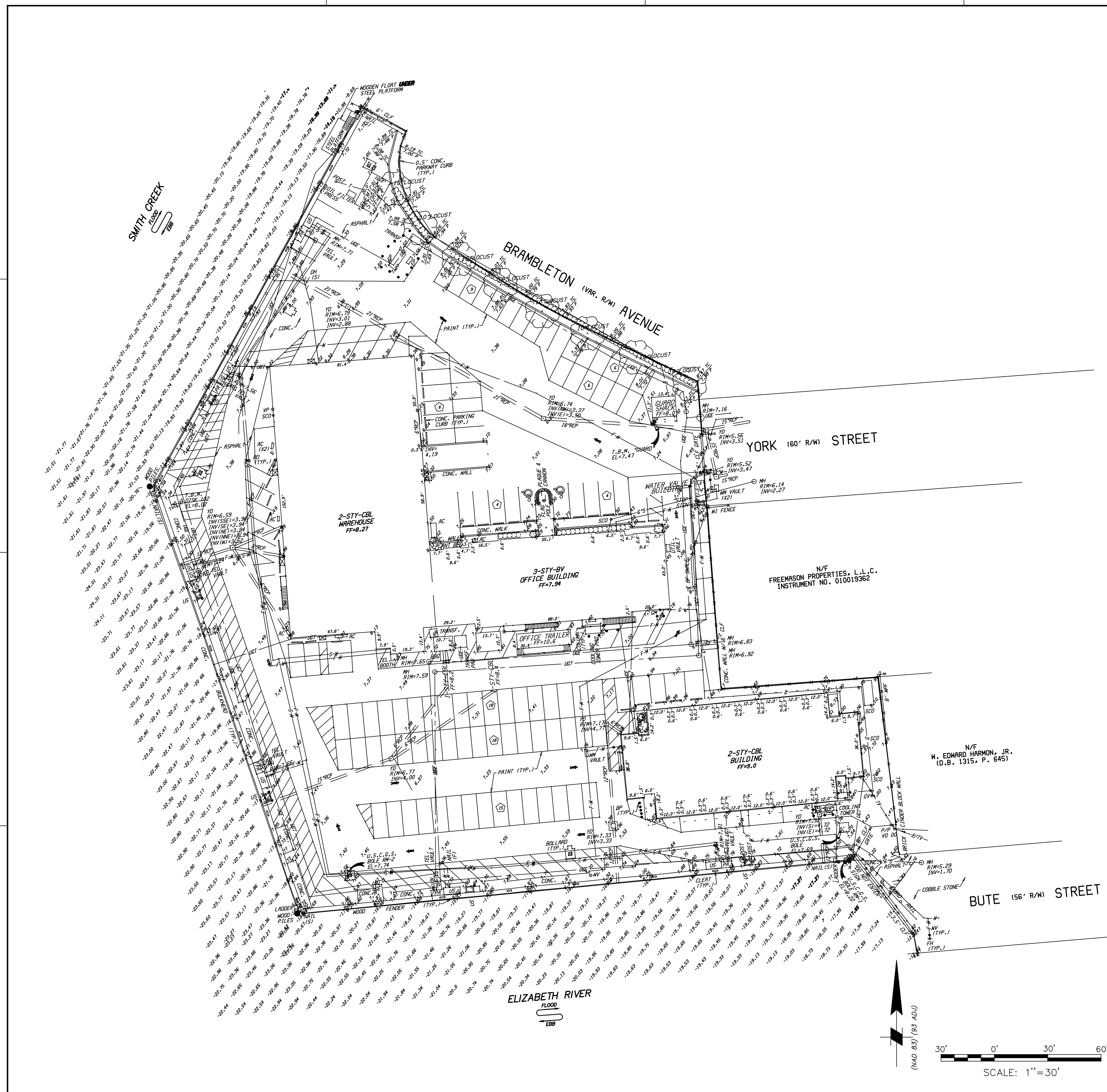
SHEET IDENTIFICATION
G-101
SHEET 3 OF 9



ISSUED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

2/18/2011



APPENDIX F

Inland Testing Manual Tables

Table 9-1. Potential Contaminants of Concern Listed According to Structural Compound Class.

Structural Compound Class	Contaminant	Structural Compound Class	Contaminant
			hexachlorocyclopentadiene
Phenols	phenol 2,4-dimethylphenol 2-methylphenol 4-methylphenol	Halogenated Ethers	bis(2-chloroethyl)ether 4-chlorophenyl ether 4-bromophenyl ether bis(2-chloroisopropyl) ether bis(2-chloroethoxy)methane
Substituted Phenols	2,4,6-trichlorophenol para-chloro-meta-cresol 2-chlorophenol 2,4-dichlorophenol 2-nitrophenol 4-nitrophenol 2,4-dinitrophenol 4,6-dinitro- <i>o</i> -cresol pentachlorophenol	Phthalates	bis(2-ethylhexyl)phthalate butyl benzyl phthalate di- <i>n</i> -butyl phthalate di- <i>n</i> -octyl phthalate diethyl phthalate dimethyl phthalate
Organonitrogen Compounds	benzidine 3,3'-dichlorobenzidine 2,4-dinitrotoluene 2,6-dinitrotoluene 1,2-diphenylhydrazine nitrobenzene <i>N</i> -nitrosodimethylamine <i>N</i> -nitrosodiphenylamine <i>N</i> -nitrosodipropylamine	Polychlorinated Biphenyls (PCB) as Aroclors ^a	PCB-1242 PCB-1254 PCB-1221 PCB-1232 PCB-1248 PCB-1260 PCB-1016
Low Molecular Weight Polynuclear Aromatic Hydrocarbons (PAH)	acenaphthene naphthalene acenaphthylene anthracene phenanthrene fluorene 1-methylnaphthalene 2-methylnaphthalene	Miscellaneous Oxygenated Compounds	TCDD (dioxin) ^b PCDF (furan) isophorone
High Molecular Weight Polynuclear Aromatic Hydrocarbons (PAH)	fluoranthene benzo(<i>a</i>)anthracene benzo(<i>a</i>)pyrene benzo(<i>b</i>)fluoranthene benzo(<i>k</i>)fluoranthene chrysene benzo(<i>ghi</i>)perylene dibenzo(<i>a,h</i>)anthracene ideno(1,2,3- <i>cd</i>)pyrene pyrene	Pesticides	aldrin dieldrin chlordane chlorbenseide dacthal DDT ^c endosulfan ^d endrin endrin aldehyde heptachlor heptachlor epoxide α -hexachlorocyclohexane β -hexachlorocyclohexane δ -hexachlorocyclohexane γ -hexachlorocyclohexane toxaphene mirex methoxychlor parathion malathion guthion demeton
Chlorinated Aromatic Hydrocarbons	1,2,4-trichlorobenzene hexachlorobenzene 2-chloronaphthalene 1,2-dichlorobenzene 1,3-dichlorobenzene 1,4-dichlorobenzene		
Chlorinate Aliphatic Hydrocarbons	hexachlorobutadiene hexachloroethane		

Table 9-1. (continued)

Structural Compound Class	Contaminant	Structural Compound Class	Contaminant		
Volatile Halogenated Alkanes	tetrachloromethane	Volatile Unsaturated Carbonyl Compounds	acrolein		
	1,2-dichloroethane		acrylonitrile		
	1,1,1-trichloroethane	Volatile Ethers	2-chlorethylvinylether bis(chloromethyl)ether		
	1,1-dichloroethane				
	1,1,2-trichloroethane	Metals	aluminum antimony arsenic beryllium butyltins cadmium chromium (hexavalent) cobalt copper iron lead manganese mercury nickel selenium silver thallium tin zinc		
	1,1,2,2-tetrachloroethane				
	chloroethane				
	chloroform				
	1,2-dichloropropane				
	dichloromethane				
	chloromethane				
	bromomethane				
	bromoform				
	dichlorobromoethane				
fluorotrichloromethane					
dichlorodifluoromethane					
chlorodibromomethane					
Volatile Halogenated Alkenes	1,1-dichlorethylene	Miscellaneous	ammonia ^e asbestos benzoic acid cyanide guaiacols methylethyl ketone resin acids		
	1,2- <i>trans</i> -dichlorethylene				
	<i>trans</i> -1,3-dichloropropene				
	<i>cis</i> -1,3-dichloropropene				
	tetrachlorethene				
	trichlorethene				
vinyl chloride					
Volatile Aromatic Hydrocarbons	benzene				
	ethylbenzene				
	toluene				
Chlorinated Benzenes	1,3-dichlorobenzene				
	1,4-dichlorobenzene				
	1,2-dichlorobenzene				
	1,2,4-trichlorobenzene				
	hexachlorobenzene				

^aIt is recommended that PCB analyses use congener-specific methods. The sum of the concentrations of specific congeners is an appropriate measure of total PCBs (see Table 9-3).

^bAdditional dioxin and furan (e.g., TCDF) compounds are listed in Table 9-2.

^cIncludes DDT, DDD, and DDE

^dIncludes α -endosulfan, β -endosulfan, and endosulfan sulfate.

^eAmmonia may not be a contaminant of concern at certain open-water dredged material disposal sites (e.g., dispersive situations and situations with well-oxygenated overlying water).

Table 9-3. Polychlorinated Biphenyl (PCB) Congeners Recommended for Quantitation as Potential Contaminants of Concern.

PCB Congener ^a	Congener Number ^b		
	Summation ^c	Highest Priority ^d	Second Priority ^e
2,4' diCB	8		
2,2',5 triCB	18		18
2,4,4' triCB	28		
3,4,4' triCB			37
2,2',3,5' tetraCB	44		44
2,2',4,5' tetraCB			99
2,2',5,5' tetraCB	52		52
2,3',4,4' tetraCB	66		
2,3',4',5 tetraCB			70
2,4,4',5 tetraCB			74
3,3',4,4' tetraCB	77	77	
3,4,4',5 tetraCB			81
2,2',3,4,5' pentaCB		87	
2,2',3,4',5 pentaCB		49	
2,2',4,5,5' pentaCB	101	101	
2,3,3',4,4' pentaCB	105	105	
2,3,4,4',5 pentaCB			114
2,3',4,4',5 pentaCB	118	118	
2,3',4,4',6 pentaCB			119
2',3,4,4',5 pentaCB			123
3,3',4,4',5 pentaCB	126 ^f	126 ^f	
2',3,3',4,4' hexaCB	128	128	
2,2',3,4,4',5' hexaCB	138	138	
2,2',3,5,5',6 hexaCB			151
2,2',4,4',5,5' hexaCB	153	153	
2,3,3',4,4',5 hexaCB		156	
2,3,3',4,4',5 hexaCB			157
2,3,3',4,4',6 hexaCB			158
2,3',4,4',5,5' hexaCB			167
2,3',4,4',5',6 hexaCB			168
3,3',4,4',5,5' hexaCB	169 ^f	169 ^f	
2,2',3,3',4,4',5 heptaCB	170	170	
2,2',3,4,4',5,5' heptaCB	180	180	
2,2',3,4,4',5',6 heptaCB		183	
2,2',3,4,4',6,6' heptaCB		184	
2,2',3,4',5,5',6 heptaCB	187		187
2,3,3',4,4',5,5' heptaCB			189

(continued)

Table 9-3. (continued)

PCB Congener ^a	Congener Number ^b		
	Summation ^c	Highest Priority ^d	Second Priority ^e
2,2',3,3',4,4',5,6 octaCB		195	
2,2',3,3',4,5,5',6' octaCB			201
2,2',3,3',4,4',5,5',6 nonaCB		206	
2,2',3,3',4,4',5,5',6,6' decaCB		209	

^aPCB congeners recommended for quantitation, from dichlorobiphenyl (diCB) through decachlorobiphenyl (decaCB).

^bCongeners are identified by their International Union of Pure and Applied Chemistry (IUPAC) number, as referenced in Ballschmiter and Zell (1980) and Mullin et al. (1984).

^cThese congeners are summed to determine total PCB concentration following the approach in NOAA (1989).

^dPCB congeners having highest priority for potential environmental importance based on potential for toxicity, frequency of occurrence in environmental samples, and relative abundance in animal tissues (McFarland and Clarke, 1989).

^ePCB congeners having second priority for potential environmental importance based on potential for toxicity, frequency of occurrence in environmental samples, and relative abundance in animal tissues (McFarland and Clarke, 1989).

^fTo separate PCBs 126 and 169, it is necessary to initially utilize an enrichment step with an activated carbon column (Smith, 1981).