

**SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT
FOR
REPAIRS TO PURVIS ROAD
AT
MARINE CORPS INSTALLATIONS - NATIONAL CAPITAL REGION
MARINE CORPS BASE QUANTICO,
PRINCE WILLIAM COUNTY, VIRGINIA
November 2021**

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ABSTRACT

Title of Proposed Action: Supplemental Environmental Assessment for Repairs to Purvis Road
Project Location: Marine Corps Base Quantico, Virginia
Lead Agency for the EA: United States Marine Corps
Action Proponent: Marine Corps Base, Quantico

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This Supplemental Environmental Assessment is intended to meet NEPA requirements to provide repairs to Purvis Road. The No Action Alternative (Alternative A) and the Action Alternative (Alternative B) were evaluated. Alternative A would have no adverse effects on cultural/natural resources or the human environment as the status quo would be maintained.

Alternative B would repair Purvis Road through full-depth replacement, as well as widening and hardening the road shoulders. There would be no significant impacts to land use, water resources, biological resources, archeological/cultural resources, air quality, noise, infrastructure, traffic, socioeconomics, or hazardous waste issues. Temporary water quality impacts associated with soil disturbance resulting from roadwork activities would be mitigated through appropriate Erosion and Sediment Control measures per the Virginia Erosion and Sediment Control Handbook.

Alternative B is the preferred action and, if the stated mitigation measures are executed, would not have significant impacts on the human environment.

An Environmental Assessment for Repairs to Purvis Road was prepared and a Finding of No Significant Impact (FONSI) signed on 6 April 2014. Since the FONSI was signed, work was delayed several years, and the scope has changed to the extent that additional review via the NEPA process is required. This SEA focuses on the changes that have been proposed. Subject areas that were previously analyzed and are not subject to the proposed changes are summarized, but not analyzed in detail.

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1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

This supplemental environmental assessment (SEA) has been prepared pursuant to the National Environmental Policy Act (NEPA) of 1969; regulations of the Council on Environmental Quality (CEQ) 40 C.F.R. parts 1500-1508; and Marine Corps Order (MCO) 5090.2, which documents the US Marine Corps' (USMC) internal operating instructions on how to implement NEPA. This SEA is intended to meet NEPA requirements for Repairs to Purvis Road, at Marine Corps Installations – National Capital Region (MCINCR), Marine Corps Base Quantico (MCBQ).

This SEA also satisfies 36 C.F.R. part 800.6(a) which states that a federal agency when presented with the potential of an adverse effect as a result of its undertaking must “develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize or mitigate adverse effects on historic properties.”

1.1 Introduction

The MCINCR-MCBQ, a Command of the United States Marine Corps (USMC) proposes to repair Purvis Road at MCBQ.

1.2 Background

An EA was prepared for this action in 2013, with a Finding of No Significant Impact (FONSI) signed on 6 April 2014. The length of time that has passed since the FONSI was signed, in addition to changes to the scope of the project, has necessitated the preparation of this SEA. A copy of the original FONSI is at Appendix A. The original EA can be obtained by contacting the MCINCR-MCBQ NREA Branch.

1.3 Location

Purvis Road exists entirely within Prince William County, on the main side of MCBQ in Quantico, Virginia. This action would take place in an area dominated by military housing, schools, and housing support facilities. Purvis Road location maps and site plans are at Appendix B.

1.4 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to provide repairs and upgrades to Purvis Road, to include the road shoulders.

The need for the Proposed Action is to repair the deteriorated conditions of Purvis Road and improve traffic patterns along the major route through base housing.

1.5 Scope of Environmental Analysis

This SEA includes an analysis of potential environmental impacts associated with the Action Alternative and the No Action Alternative. The environmental resource areas analyzed in detail

in this SEA include: water resources, geological resources, cultural resources, biological resources, and land use.

The following environmental resource areas were analyzed in detail in the original EA: air quality, visual resources, military training and airspace, noise, infrastructure, transportation, public health and safety, hazardous materials and waste, socioeconomics, and environmental justice. As there are no anticipated changes to these subject areas as a result from the changes in project scope, they were not analyzed in detail in this document.

1.6 Relevant Laws and Regulations

The USMC has prepared this SEA based upon federal and state laws, statutes, regulations, and policies pertinent to the implementation of the Proposed Action, including the following:

- National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] sections 4321-4370h), which requires an environmental analysis for major federal actions that have the potential to significantly impact the quality of the human environment
- Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [C.F.R.] parts 1500-1508)
- Clean Air Act (42 U.S.C. section 7401 et seq.)
- Clean Water Act (33 U.S.C. section 1251 et seq.)
- Coastal Zone Management Act (16 U.S.C. section 1451 et seq.)
- National Historic Preservation Act (54 U.S.C. section 306108 et seq.)
- Endangered Species Act (16 U.S.C. section 1531 et seq.)
- Migratory Bird Treaty Act (16 U.S.C. sections 703-712)
- Bald and Golden Eagle Protection Act (16 U.S.C. section 668-668d)
- Comprehensive Environmental Response and Liability Act (42 U.S.C. section 9601 et seq.)
- Resource Conservation and Recovery Act (42 U.S.C. section 6901 et seq.)
- Toxic Substances Control Act (15 U.S.C. sections 2601-2629)
- Executive Order (EO) 11988, Floodplain Management
- EO 11990, Protection of Wetlands
- EO 12088, Federal Compliance with Pollution Control Standards
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks
- EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management
- EO 13175, Consultation and Coordination with Indian Tribal Governments
- EO 13693, Planning for Federal Sustainability in the Next Decade

A description of the Proposed Action's consistency with these laws, policies, and regulations, as well as the names of regulatory agencies responsible for their implementation, is presented in Chapter 6.0 (Table 6-1).

1.7 Public and Agency Participation and Intergovernmental Coordination

Regulations from the Council on Environmental Quality (CEQ) direct agencies to involve the public in preparing and implementing their NEPA procedures.

The USMC has prepared this SEA to inform the public of the Proposed Action and to allow the opportunity for public review and comment. The SEA will also be made available on the following website, <https://www.quantico.marines.mil/Offices-Staff/G-F-Installation-and-Environment/Natural-Resources-Environmental-Affairs/>

The USMC has coordinated/consulted with the U.S. Fish and Wildlife Service (USFWS) and the Army Corps of Engineers (ACoE) regarding the Preferred Alternative. The USMC also consulted with the Virginia State Historic Preservation Officer (SHPO) regarding this proposed action.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

The USMC proposes to repair Purvis Road. The Proposed Action would repair the road via full-depth replacement. The road shoulders would also be widened and paved.

2.2 Alternatives Carried Forward for Analysis

2.2.1 Alternative A - No Action

Under the No Action Alternative, the Proposed Action would not occur. Purvis Road would not receive needed repairs and upgrades. The No Action Alternative would not meet the purpose and need for the Proposed Action; however, as required by NEPA, the No Action Alternative is carried forward for analysis in this SEA. The No Action Alternative will be used to analyze the consequences of not undertaking the Proposed Action, not simply conclude no impact, and will serve to establish a comparative baseline for analysis.

2.2.2 Alternative B – Repair Purvis Road (Preferred Alternative)

As described in the previously prepared EA, the Action Alternative would provide full-depth repairs and resurfacing to Purvis Road, as well as repairs to and widening and paving of the road shoulders.

3.0 Affected Environment & Environmental Consequences

This section presents a description of the environmental resources currently within the proposed action footprint as well as the indirect and direct effects of both alternatives. The CEQ defines direct effects as those effects that are caused by the action and occur at the same time and place (CEQ 1508.8). Conversely, indirect effects are defined by the CEQ as effects that are caused by

the action and are later in time or farther removed in distance but are still relatively foreseeable (CEQ 1508.8).

All potentially relevant environmental resource areas were initially considered for analysis in the original EA. In compliance with NEPA, the CEQ, Department of the Navy (DoN), and USMC guidelines, this SEA analyzes in depth only those areas of the affected environment (ie., existing conditions) that could potentially be impacted by the change in scope of the project. Additionally, the level of detail used in describing a resource is commensurate with the anticipated level of potential environmental impact. This section includes air quality, water resources, geological resources, cultural resources, biological resources, land use, visual resources, military training and airspace, noise, infrastructure, transportation, public health and safety, hazardous materials and wastes, socioeconomics, and environmental justice.

The potential impacts to the following resource areas are considered to be negligible or non-existent so they were not analyzed in detail in this SEA: Visual Resources, Military Training and Airspace, Noise, Infrastructure, Transportation, Public Health and Safety, Hazardous Materials and Wastes, Socioeconomics, and Environmental Justice.

The CEQ regulations implementing NEPA (40 C.F.R. part 1500) require discussion of the impacts in proportion to their significance within NEPA documentation. The affected environment under the proposed action alternative ranges from site-specific physical and natural resources to broader regional concerns (i.e., air quality variables, noise, infrastructure, socioeconomic conditions, community facilities and services, transportation and traffic).

This section describes the anticipated direct, indirect, and cumulative environmental impacts of the no action alternative and one action alternative for Repairs to Purvis Road. Alternative A is no action and Alternative B is the proposed action.

3.1 Air Quality

3.1.1 Regulatory Setting

3.1.1.1 National Ambient Air Quality Standards and Criteria Pollutants

The U.S. Environmental Protection Agency (EPA) defines ambient air as “that portion of the atmosphere, external to buildings, to which the general public has access” (40 C.F.R. part 50). In compliance with the Clean Air Act (CAA) (42 U.S.C. §7401 et seq.) the EPA promulgated the National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO₂), particulate matter (PM), ozone, nitrogen dioxide (NO_x), and lead. States are required to develop a State Implementation Plan (SIP) to attain and maintain the NAAQS, with specific requirements for areas that do not meet the NAAQS, called nonattainment areas. The location of the proposed action is within the Metropolitan Washington (DC) Region that has been designated as a moderate non-attainment area for the 8-hour ozone NAAQS and a general non-attainment for PM_{2.5}. NO_x and volatile organic compounds (VOCs) are precursors to ozone formation and are regulated to control ozone pollution.

3.1.1.2 General Conformity

To ensure that actions taken by federal agencies in a nonattainment area do not interfere with a state's plan for attainment of the NAAQS, EPA promulgated the General Conformity rule [CAA section 176(c)(4)]. The General Conformity rule requires federal actions, whose emissions exceed *de minimis* thresholds of criteria pollutants and their precursors, to undergo a Conformity Determination. A Conformity Determination is a detailed analysis the action's impact on regional air quality. *De minimis* levels in the DC region are:

- NO_x: 100 tons per year (tpy)
- VOC: 50 tpy
- PM_{2.5}: 100 tpy

An Applicability Analysis is the first step in the Conformity process, used to determine if a full Conformity Determination must support the action. Proposed actions may be exempt from a Conformity Determination by two means:

1. If EPA identifies the action in 40 C.F.R. part 93.153(c)(2) as resulting in no emissions increase or an increase that is clearly *de minimis*.
2. If emissions from the action, including construction and post construction activities, are calculated and determined to fall below the *de minimis* emission rates.

If the Conformity Analysis indicates that the action falls into one of the listed actions, or the emissions are below *de minimis* thresholds, no further action is necessary. For actions that exceed *de minimis* thresholds and are not exempt, a Conformity Determination is required.

A Conformity Determination requires detailed direct and indirect emissions estimates, dispersion modeling analysis, and mitigation of air quality impacts, and an opportunity for public comment prior to approval.

3.1.1.3 Permitting

New Source Review (Preconstruction Permit)

New Source Review (NSR) is a federally mandated program, implemented by the States, that requires construction or modification of regulated stationary sources undergo a preconstruction permitting process. NSR is used to define what equipment may be installed, pollution controls that may be required, operating parameters, and notification, recordkeeping, and reporting requirements.

The stringency of an NSR permit depends on the size of the stationary source and the region in which it is located. Permitting programs exist for both major and minor sources located in NAAQS attainment or nonattainment areas.

- Minor New Source Review (Minor NSR). Minor NSR permits are required when a source does not meet the definition of a major source, but is large enough to interfere

with a state's plan for attaining or maintaining the NAAQS. Minor NSR permits may also be used to limit emissions from a project that would otherwise be subject to major source permitting.

- Prevention of Significant Deterioration (PSD). PSD permits are issued for new major sources of air pollution or major modifications to existing major sources of air pollution in a NAAQS *attainment* area. PSD permits require application of Best Available Control Technology (BACT), dispersion modeling, and public notification and comment periods.
- Nonattainment New Source Review (N-A NSR). N-A NSR permits are issued for new major sources of air pollution or major modifications to existing major sources of air pollution in a NAAQS *nonattainment* area. N-A NSR requires application of Lowest Achievable Emissions Rate (LAER) and public notification and comment periods. In addition, facilities are required to offset the potential increase in emissions with a greater reduction in actual emissions elsewhere in the region to ensure improvement of the local air quality.

A case-by-case review of each new stationary source or modification is required to determine which permitting program is applicable. Generally, NO_x from fuel combustion is the limiting pollutant at MCBQ. Since MCBQ is a major source of NO_x pollution in an ozone nonattainment area, any project that has a potential to emit (PTE) greater than 40 tpy of NO_x will be subject to N-A NSR permitting. A project with a PTE greater than 10 tpy but less than 40 tpy of NO_x will be subject to Minor NSR permitting. Projects with a PTE less than 10 tpy of NO_x are typically exempt from preconstruction permitting requirements (however, they may still be considered significant equipment in a Title V operating permit). The base operates under a minor new source review (mNSR) permit signed in August 2014.

Title V (Operating Permit)

Generally, major sources of pollution are required to obtain federal operating permits issued under Title V of the CAA by either the EPA or the state regulatory agency. The primary purpose of a Title V permit is to improve compliance at a source by consolidating all requirements into a single document. Title V permits are reviewed and reissued on a 5 year cycle. While some changes to equipment may occur as “off-permit” changes and may be incorporated into the next permit renewal, most NSR permit actions require modification of the Title V permit within 12 months.

In the DC ozone nonattainment area, any source with a NO_x PTE greater than 100 tpy is a major source and must apply for a Title V Permit within 12 months of being designated such. The proposed project would occur entirely within Prince William County, which is an ozone attainment area.

The base's NO_x PTE is well above 100 tpy. The base currently operates under a Title V permit issued by the VDEQ on 2 September 2003. A renewal application sent in June 2018 is pending.

3.1.1.4 Greenhouse Gases

Greenhouse Gas (GHG) reporting and permitting are the newest broad scale programs under the CAA. In 2009, the EPA determined that GHGs have a detrimental effect on human health and the environment and began developing regulatory programs to limit the emission of GHGs.

Greenhouse gases (GHG) are gas emissions that trap heat in the atmosphere (called the “greenhouse effect”). It is a natural phenomenon that can create a wide range of environmental concerns referred to as climate change. Climate change is associated with rising global temperatures, sea level rise, changing weather patterns, changes to local and regional ecosystems, including the potential loss of species, longer growing seasons, and shifts in plant and animal ranges.

Most GHGs occur naturally within the atmosphere but scientific evidence indicates a trend of increasing global temperature over the past century due to a combination of natural occurrences and an increase in GHG emissions from human activities (Intergovernmental Panel on Climate Change, 2007). GHGs include carbon dioxide (CO₂), methane (CH₄), nitrogen oxide (NO_x), hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and other fluorinated gases including nitrogen trifluoride and hydrofluorinated ethers.

According to the Quadrennial Defense Review Report of February 2010, the DoD has recognized that climate change will affect the DoD operating environment, roles, and missions undertaken; furthermore, adjustments due to climate change impacts on facilities and military capabilities will be necessary. The DoD has made a commitment to foster efforts to assess, adapt to, and mitigate the impacts of climate change. Specifically, the DoD has leveraged the Strategic Environmental Research and Development Program, a joint effort among the DoD, the Department of Energy, and the EPA, to develop climate change assessment tools.

GHG Reporting

In October 2009, the EPA promulgated the GHG Reporting Rule in 40 C.F.R. part 98. The rule establishes mandatory reporting requirements for facilities that fit into any of three applicability classifications.

A facility may be required to report GHG emissions if it falls into an “all-in” source category defined in 40 C.F.R. part 98.2(a)(1). One of these categories is Municipal Solid Waste (MSW) Landfills that emit more than 25,000 metric tons of carbon dioxide equivalent (CO₂e) in a year and accepted waste after 1 January 1980. The base has three MSW landfills, two of which accepted waste after 1 January 1980.

A facility may also be required to report if it falls into a second set of defined source categories and emits more than 25,000 metric tons of CO₂e in a year. The second set of categories includes production facilities outlined in 40 C.F.R. part 98.2(a)(2). The base does not operate any of these facilities.

Finally, a facility may be required to report if it does not meet either of the first two requirements, but it does operate stationary fuel combustion equipment with an aggregate rated heat input capacity of at least 30 MMBtu/hr and the facility emits more than 25,000 metric tons of CO₂e in a year from these sources. The aggregate rated heat input capacity of MCBQ is well in excess of 30 MMBtu/hr.

The base's MSW landfills and stationary fuel combustion equipment emissions are evaluated annually to determine applicability of Part 98. The most recent calculations demonstrate that, based on 2013 data, Part 98 reporting requirements do not apply to the base. As of 2013, base-wide CO₂e emissions from stationary fuel combustion equipment totaled 18,658 tons.

GHG Permitting

The NSR and Title V permitting programs apply to GHGs if a facility is subject to those programs for other pollutants. While traditional permitting thresholds for NSR and Title V technically apply to GHGs, actual application of those thresholds has been found impractical to use as thresholds for GHGs. In response, EPA has used its discretion to increase the thresholds under those programs for GHGs so that excessive GHG regulation and controls is avoided. The current threshold for significant emissions increases of GHGs is 75,000 TPY of CO₂e or more, and the Title V threshold for GHGs is 100,000 TPY of CO₂e or more. If GHG emissions are included in any NSR permit issued to MCBQ, then BACT and other NSR requirements will apply and be reflected in the MCBQ Title V permit.

On 23 June 2014, the U.S. Supreme Court issued a decision that said EPA could not require a source to obtain a PSD or Title V permit on the basis of GHG emissions alone. However, sources that must obtain PSD or Title V permits based on regulated NSR pollutants may still be required to control GHG emissions by application of BACT.

Pending further court action, a new stationary source at MCBQ may be subject to BACT for GHGs if it causes a significant emissions increase of a regulated NSR pollutant and also an emissions increase of 75,000 CO₂e or more.

Ozone Depleting Substances

Title VI of the CAA regulates the manufacture and use of ozone depleting substances (ODS) typically found in certain refrigerants, fire extinguishers, and consumer products. Work on equipment containing ODS must be performed only by technicians who are certified through an EPA accredited course. 40 C.F.R. part 82 requires strict production, consumption, recycling, and emission reduction programs.

The base operates a number of heating, ventilation, and air conditioning (HVAC) units that use ODS.

Virginia SIP Regulations

Virginia's SIP includes a number of broadly applicable regulations as well as process-specific regulations for existing sources intended to ensure continued progress towards attainment of all NAAQS.

Cutback asphalt (asphalt cement that has been liquefied by blending with petroleum solvents) is prohibited except under special circumstances. The NREA Air Program Manager must be consulted if the proposed action involves the use of cutback asphalt.

Traffic making is limited to 150 grams/Liter of VOC per 9 VAC 5-45, Article 5: Emission Standards for Architectural and Industrial Maintenance Coatings. Building coatings must conform to Table 45-5A in the same rule. Additionally, adhesives and sealants must conform to the limits in Table 45-6A in 9 VAC 5-45, Article 6.

3.1.2 Affected Environment

No changes to emission estimates from the initial project review are deemed necessary, as conservative emission calculations estimated that the entire length of Purvis Road would be paved to allow for changes in project design.

3.1.3 Environmental Consequences

MCBQ is located in a moderate ozone non-attainment area within the Ozone Transport Region, and in a PM_{2.5} non-attainment area. The pollutant *de minimis* criterion for General Conformity evaluations is 50 tons per year (tpy) for volatile organic compounds (VOC), 100 tpy for NO_x, 100 tpy for PM_{2.5}, and 100,000 tpy for CO₂. Sources of these pollutants associated with Alternative B would include emissions from construction materials and equipment, crew commuting vehicles, fugitive dust, and from use of other fuel-burning equipment. Projected emissions from the action alternative will fall within the *de minimis* levels.

General Conformity

The General Conformity Rule ensures that the actions taken by federal agencies in nonattainment and maintenance areas do not interfere with a state's plans to meet the NAAQS.

A federal agency must perform a General Conformity applicability analysis prior to initiating any non-exempt action that will cause emissions of criteria pollutants for which the area is designated nonattainment or maintenance. The analysis must include reasonable estimates of direct emissions (caused by the action; occur at the same time and place) and indirect emissions (caused by the action; may occur later in time or in a different location than the action). The analysis must be performed for each year of the action and one year of typical operations. If the analysis indicates that the emission levels are below *de minimis* thresholds for all years, then no further action is necessary.

Annual direct and indirect emissions from the proposed action are calculated to be below all applicable *de minimis* thresholds in 40 C.F.R. part 93.153(b). A General Conformity Determination is not required. A Record of Non-Applicability is at Appendix C.

Table 3.1 PROJECTED ACTUAL EMISSIONS

			VOC	CO	NO _x	PM	CO ₂	SO ₂
CONSTRUCTION EQUIPMENT	Quantity	Usage	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)
Tractors/Loaders/Backhoes	2	664	142.21	665.89	1,518.30	156.72	157,745.92	319.02
Air Compressors	1	664	65.15	305.05	695.55	71.80	72,264.78	146.14
Paving Equipment	1	664	151.63	400.74	2,517.68	152.33	233,252.01	471.72
Tractors/Loaders/Backhoes	1	400	42.83	200.57	457.32	47.21	47,513.83	96.09
Pavers	1	72	16.85	44.55	279.86	16.93	25,928.07	52.44
Rollers	2	72	32.70	153.12	349.13	36.04	36,273.77	73.36
Pavers	1	45	10.53	27.84	174.91	10.58	16,205.04	32.77
Rollers	3	45	30.66	143.55	327.31	33.79	34,006.66	68.77
Paving Equipment	1	416	94.99	251.06	1,577.34	95.44	146,133.79	295.54
HIGHWAY VEHICLES	Vehicle-Days	Miles/Day	VOC (lbs)	CO (lbs)	NO_x (lbs)	PM (lbs)	CO₂ (lbs)	SO₂ (lbs)
Light Heavy Duty (Diesel)	932	50	20.54	78.80	607.77	3.69	53,318.51	0.00
ASPHALT PAVING			(lbs)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)
Total Asphalt Paving Operations			56,730.96					
TOTAL PROJECTED EMISSIONS (tons)			28.67	1.14	4.25	0.31	411.32	0.78

Virginia SIP Regulations

The proposed action is subject to the following Virginia regulations:

- 9 VAC 5-40, Article 1 - Visible Emissions and Fugitive Dust/Emissions
- 9 VAC 5-40, Article 2 – Odor

Visible Emissions and Fugitive Dust/Emissions

No owner or other person shall cause or permit any materials or property to be handled, transported, stored, used, constructed, altered, repaired or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne. Such reasonable precautions may include, but are not limited to, the following:

1. Use, where possible, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land.
2. Application of asphalt, water, or suitable chemicals on dirt roads, materials stockpiles and other surfaces, which may create airborne dust; the paving of roadways and maintaining them in a clean condition.

3. Installation and use of hoods, fans and fabric filters to enclose and vent the handling of dusty materials. Adequate containment methods shall be employed during sandblasting or other similar operations.
4. Open equipment for conveying or transporting materials likely to create objectionable air pollution when airborne shall be covered or treated in an equally effective manner at all times when in motion.
5. The prompt removal of spilled or tracked dirt or other materials from paved streets and of dried sediments resulting from soil erosion.

Odor

No owner or other person shall cause or permit to be discharged into the atmosphere from any affected facility any emissions, which cause an odor objectionable to individuals of ordinary sensibility.

New Source Review Permitting

The proposed action as currently planned does not involve the construction of any new stationary source or any project (which includes any addition or replacement of an emissions unit, any modification to an emissions unit or any combination of these changes), or the reduction of any stack outlet elevation at any stationary source. Therefore, NSR permitting regulations do not apply.

3.1.4 Greenhouse Gases

CEQ's NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions states that "if a proposed action would be reasonably anticipated to cause direct emissions of 27,563 tpy (25,000 metric tons) or more of CO₂-equivalent GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public." These recommendations are consistent with the EPA's Mandatory Reporting of Greenhouse Gases rule (40 C.F.R. part 98) (2009), which applies to all stationary sources emitting 27,563 tpy or more of GHG emissions. The rule allows for data collection to help shape future climate change policies and programs but does not require control of GHGs.

3.1.5 Environmental Consequences

3.1.5.1 Impacts of Alternative A – No Action:

Under the No Action Alternative, Alternative A, current conditions would remain and no impacts to MCBQ air quality would occur. The no action alternative would not cause an increase in GHG emissions and would not have new effects on climate change.

3.1.5.2 Impacts of Alternative B – Repairs to Purvis Road:

No additional new air emissions sources are currently being proposed with Alternative B. If this changes, specifications for the new emissions source are required to be submitted to the NREA Air Program manager for review. Alternative B would not significantly impact air quality at MCBQ, however, the following guidance must be followed:

1. Record of Non-Applicability (RONA) (See Appendix C)

General Conformity under the Clean Air Act, Section 1.76, has been evaluated for the proposed project according to the requirements of MCO 5090.2A and 40 CFR 93 Subpart B. The requirements of this rule are not applicable to this project because the total direct and indirect emissions from this project have been estimated at 4.25E+01 tons per year NO_x, and 28.67E+00 tons per year VOC. These levels are below the conformity threshold value of 100 tpy NO_x and 50 tpy VOC, established by 40 CFR 93.153(b), for a Non-Attainment Area located in an Ozone Transportation Region.

2. Paints, Coatings, and Adhesives

Paints, coatings, and adhesives are to conform to VOC requirements per the Commonwealth of Virginia, State Air Pollution Control Board, Regulations for the Control and Abatement of Air Pollution, 9VAC5 Chapter 45, Consumer and Commercial Products, Part II Emission Standards, Article 5 Emission Standards for Architectural and Industrial Maintenance Coatings and Article 6 Emission Standards for Adhesives and Sealants.

The proposed action is subject to the following Virginia regulations:

- 9 VAC 5-45, Article 5 - Emission Standards for Architectural and Industrial Maintenance Coatings

Emission Standards for Architectural and Industrial Maintenance Coatings - Any architectural coating that is sold in a container larger than one quart must comply with the VOC emission limit in Table 45-5A.

3. Cutback Asphalt

Emission Standards for Asphalt Paving Operations: Cutback asphalt (asphalt cement that has been liquefied by blending with petroleum solvents) is prohibited except under special circumstances. The NREA APM must be consulted if the proposed action involves the use of cutback asphalt.

4. Traffic Marking

The VOC limit for paints used to mark traffic surfaces is 150 grams of VOC per liter of coating thinned to the manufacturer's maximum recommendation, excluding the volume of any water, exempt compounds, or colorant added to tint bases.

5. Fugitive Dust

The proposed action is subject to the following Virginia regulations:

.9 VAC 5-40, Article 1 - Visible Emissions and Fugitive Dust/Emissions

No owner or other person shall cause or permit any materials or property to be handled, transported, stored, used, constructed, altered, repaired or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne. Such reasonable precautions may include, but are not limited to, the following:

- a. Use, where possible, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land.
- b. Application of asphalt, water, or suitable chemicals on dirt roads, materials stockpiles and other surfaces which may create airborne dust; the paving of roadways and maintaining them in a clean condition.
- c. Installation and use of hoods, fans and fabric filters to enclose and vent the handling of dusty materials. Adequate containment methods shall be employed during sandblasting or other similar operations.
- d. Open equipment for conveying or transporting materials likely to create objectionable air pollution when airborne shall be covered or treated in an equally effective manner at all times when in motion.
- e. The prompt removal of spilled or tracked dirt or other materials from paved streets and of dried sediments resulting from soil erosion.

6. Odor

The proposed action is subject to the following Virginia regulations:

.9 VAC 5-40, Article 2 - Odor

No owner or other person shall cause or permit to be discharged into the atmosphere from any affected facility any emissions which cause an odor objectionable to individuals of ordinary sensibility.

7. Greenhouse Gases

The proposed project will not add new emission sources. This project will not encourage a use change; the proposed project supports the current mission activities. Road repair and construction emissions would be short in duration and are not covered by the Mandatory Reporting of Greenhouse Gases rule as the intent is to track and regulate stationary sources. This project would not have any long term changes in stationary or mobile emission sources or

landfill operations. In compliance with the CEQ's and EPA's guidance, quantitative analysis of CO2 equivalents is not required for the proposed action.

GHG Reporting

Actual emissions from the proposed action are not expected to cause the total GHG emissions from MCBQ to exceed mandatory reporting thresholds.

GHG PSD Permitting

The proposed action does not involve the construction of any new stationary source or any project (which includes any addition or replacement of an emissions unit, any modification to an emissions unit or any combination of these changes), or the reduction of any stack outlet elevation at any stationary source. Therefore, GHG PSD permitting regulations do not apply.

GHG Title V Permitting

Actual emissions from the proposed action are not anticipated to cause the GHG PTE of the entire base to exceed 100,000 tpy, so the base will remain exempt from Title V permitting requirements for GHGs.

3.2 Water Resources

This discussion of water resources includes groundwater, surface water, wetlands, floodplains, and shorelines. This section also discusses the physical characteristics of groundwater, surface water, wetlands, floodplains, and shorelines. Wildlife and vegetation are addressed in Section 3.5, Biological Resources.

Groundwater is water that flows or seeps downward and saturates soil or rock, supplying springs and wells. Groundwater is used for water consumption, agricultural irrigation, and industrial applications. Groundwater properties are often described in terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition. Sole source aquifer designation provides limited protection of groundwater resources which serve as drinking water supplies.

Surface waters generally consist of wetlands, lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale.

Wetlands are jointly defined by USEPA and US Army Corps of Engineers (ACoE) as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands generally include "swamps, marshes, bogs and similar areas."

Floodplains are areas of low-level ground present along rivers, stream channels, large wetlands, or coastal waters. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, and nutrient cycling. Floodplains also help to maintain water quality and are often home to a diverse array of plants and animals. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body. Floodplain boundaries are most often defined in terms of frequency of inundation, that is, the 100-year and 500-year flood. Floodplain delineation maps are produced by the Federal Emergency Management Agency (FEMA) and provide a basis for comparing the locale of the Proposed Action to the floodplains.

Shorelines can be located along marine (oceans), brackish (estuaries), or fresh (lakes) bodies of water. Physical dynamics of shorelines include tidal influences, channel movement and hydrological systems, flooding or storm surge areas, erosion and sedimentation, water quality and temperature, presence of nutrients and pathogens, and sites with potential for protection or restoration. Shoreline ecosystems are vital habitat for multiple life states of many fish, birds, reptiles, amphibians, and invertebrates. Different shore zones provide different kinds and levels of habitat, and when aggregated, can significantly influence life. Organic matter that is washed onto the shore, or “wrack,” is an important component of shoreline ecosystems, providing habitat for invertebrates, soil and organic matter, and nutrients to both the upland terrestrial communities and aquatic ecosystems.

3.2.1 Regulatory Setting

Activities in surface waters (including streams) and wetlands are regulated under numerous federal laws, regulations, and policies. The proposed action would be bound by the following:

- The Clean Water Act (CWA), 33 U.S.C. §1344 (Section 404) requires a permit from the US Army Corps of Engineers for the discharge of dredged or fill material in to “waters of the US”, a term that includes most streams, wetlands, and ponds.
- Executive Order (E.O.) 11990, *Protection of Wetlands*, requires federal agencies to take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.
- Department of the Navy “no net loss” policy, for implementing E.O. 11990.

The Commonwealth of Virginia also regulates streams and wetlands that are considered “waters of the state” through a number of laws and provisions. Any action that requires a federal Section 404 permit may also require a water quality certification per CWA 33 U.S.C. §1341 (Section 401) from the Virginia Department of Environmental Quality (VDEQ) and, under certain circumstances, the Virginia Marine Resources Commission.

In 1988, Virginia enacted the Chesapeake Bay Preservation Act (CBPA), Code of Virginia, Title 10.1-Conservation, Chapter 21. This Act established a cooperative program between state and local governments to improve water quality in the Bay by requiring resource management practices in the use and development of environmentally sensitive land features. As defined by the CBPA, Resource Protection Areas (RPA) are buffer zones that include all areas within 100 feet of a tidal wetland, contiguous non-tidal wetlands, or perennial streams. Other areas are

designated as Resource Management Areas (RMA). The RMA includes the 100-year floodplain, highly erodible soils, highly permeable soils, and non-tidal wetlands that are not part of an RPA. The Department of Defense (DoD) is a signatory to an agreement supporting the CBPA and its associated regulations and will comply to the maximum extent possible consistent with the military mission and budget constraints.

3.2.2 Affected Environment

3.2.2.1 Groundwater

The Potomac Aquifer extends from New Jersey in the north, to North Carolina in the south, and eastward under the Chesapeake Bay. The MCBQ lies within this aquifer. In this aquifer water can be reached at depths between 200 and 350 feet. One of the largest surface recharge areas for the Potomac Aquifer exists in Stafford County, near Interstate 95. No comprehensive studies of groundwater resources have been conducted at MCBQ to date.

3.2.2.2 Surface Water and Wetlands

The project as currently planned will occur adjacent to ACoE and Virginia DEQ jurisdictional streams and wetlands. The contractor shall acquire all appropriate permits through both agencies prior to impacts being taken. Surface water and wetlands information is at Appendix D.

3.2.2.3 Floodplains

Executive Order 11988 (1977), Floodplain Management, requires federal agencies to take action to minimize occupancy and modification of floodplains. The order specifically prohibits federal agencies from funding construction in the 100-year floodplain unless no practicable alternative exists.

The area of Purvis Road is depicted on the FEMA Flood Insurance Rate Map (FIRM) numbers 51153C0312E, 51153C0311D, and 51153C0313E. The FIRMs show the entire project area inside of Flood Zone (X) which include areas with a 0.2% Annual Chance Flood Hazard, areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile, and areas outside of the 500-year floodplain. The FIRM maps are at Appendix E.

3.2.2.4 Shorelines/Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. §1451, et seq., as amended) provides guidance to states, in cooperation with federal and local agencies, for developing land and water use programs in coastal zones. The CZMA states that “the boundary of a State’s coastal zone must exclude lands owned, leased, held in trust or whose use is otherwise by law subject solely to the discretion of the Federal Government, its officers, or agents” [16 U.S.C. §1453 (1)]. According to this statute, MCBQ is not within Virginia’s coastal zone.

The CZMA 16 U.S.C. §1456 (Section 307) covers coordination and cooperation issues. Section

307 mandates that federal projects that affect land uses, water uses, or other coastal resources of a state's coastal zone must be consistent to the maximum extent practicable with the enforceable policies of that state's federally-approved coastal management plan. If a proposed federal project or activity affects coastal resources or uses beyond the boundaries of the federal property, Section 307 of the CZMA applies.

The Commonwealth of Virginia has developed and implemented a federally-approved coastal resources management program (CRMP) describing current coastal legislation and enforceable policies. The Virginia CRMP has nine enforceable policies which include: wetlands management, fisheries management, subaqueous lands management, dune management, non-point source pollution control, point source pollution control, shoreline sanitation, air pollution control, and coastal lands management.

3.2.3 Environmental Consequences

Potential impacts to the water resources were assessed based on the water quality, hydrology, surface water and wetlands, groundwater, and flooding potential in the project area.

3.2.3.1 Impact of Alternative A – No Action:

It is expected that impacts to water resources would remain the same if no action is taken. Area stormwater flows discharge to the Potomac River via Little Creek to the north and Chopawamsic Creek to the south via stormwater drains.

3.2.3.2 Impact of Alternative B – Repairs to Purvis Road:

The action alternative, Alternative B, would repair the full depth of Purvis Road, and widen and pave the road shoulder. The removal of vegetation associated with this project is negligible and any additional impervious surfaces would be minor.

No wetlands or surface waters will be directly affected through filling or alteration of hydrology. Potential water quality impacts from soil disturbances will be mitigated through the implementation of Best Management Practices (BMPs) per the Virginia Erosion and Sediment Control Handbook (1992). The demolition projects will require installation of proper E&SC measures (such as proper silt fence and storm drain inlets) prior to the onset of land disturbing activities. Any permits required shall be obtained prior to land disturbing activities.

The proposed action alternative would require no fill within the 100-year floodplain, which is considered an RMA under the CBPA. None of the alternatives would adversely affect an RPA or RMA as defined under the CBPA.

The proposed construction project is consistent to the maximum extent practicable with the enforceable policies of Virginia's Coastal Management Plan. The proposed project is not expected to have an effect on fisheries, shorelines, subaqueous lands, dunes, or coastal lands.

Alternative B would not adversely affect wetlands, surface waters, groundwater, CBPA requirements, or floodplain areas provided the planned avoidance and mitigation measures are followed.

The implementation of basic erosion and sediment control practices will be required during the duration of this project as specified in the Virginia Erosion and Sediment Control Handbook (VDCR 1992). The proper installation and maintenance of E&SC measures will minimize the movement of disturbed soils off-site and into the Potomac River watershed. Following construction, the disturbed area will be seeded and returned to pervious surfaces.

3.3 Geological Resources

This discussion of geological resources includes topography, geology, and soils.

A geotechnical survey has not been completed for the proposed action. It is advised that a geotechnical engineer survey the underlying soil in the event that these areas should be redeveloped in the future.

3.3.1 Regulatory Setting

Consideration of geologic resources extends to prime or unique farmlands. The Farmland Protection Policy Act (FPPA) was enacted in 1981 in order to minimize the loss of prime farmland and unique farmlands as a result of federal actions. The implementing procedures of the FPPA require federal agencies to evaluate the adverse effects of their activities on farmland, which includes prime and unique farmland and farmland of statewide and local importance, and to consider alternative actions that could avoid adverse effects.

3.3.2 Affected Environment

The following discussions provide a description of the existing conditions for each of the categories under geological resources at MCBQ.

3.3.2.1 Topography

The terrain of the proposed project location consists of a mostly cleared and highly disturbed landscape and is characterized by varying gradients. The elevation in the proposed footprint ranges between approximately 30 feet and 250 feet.

3.3.2.2 Geology

The proposed action would occur within the Mainside portion of the base, which lies in the Coastal Plain geologic region. The region consists of Mesozoic and Cenozoic marine sediments, some consolidated into sandstone and marl. The project area is specifically within the Patapsco formation, which dates to the Cretaceous Period at the end of the Mesozoic Era. It is comprised of sand and clay from shallow aquatic deposits, which cover Pre-Cambrian crystalline rock with a thickness of approximately 150 feet. These deposits are generally unconsolidated. The soils

found in the Coastal Plain are the result of the soil formation on the underlying sediments.

3.3.2.3 Soils

There are multiple soil types contained within the proposed project footprint. Soil type maps and descriptions for the location is at Appendix F.

It is important to note that extensive land clearing and construction activities have occurred in this area, and the conditions of the soils in this location have been affected by these activities.

Geological resources are analyzed in terms of drainage, erosion, and prime farmland. The analysis of topography and soils focuses on the area of soils that would be disturbed, the potential for erosion of soils from construction areas, and the potential for eroded soils to become pollutants in downstream surface water during storm events. BMPs are identified to minimize soil impacts and prevent or control pollutant releases into stormwater. The potentially affected environment for geological resources is limited to lands that would be disturbed by any proposed facility development or demolition.

3.3.3 Environmental Consequences

3.3.3.1 Impacts of Alternative A – No Action:

It is anticipated that impacts would remain the same, and continue to worsen, if the proposed repairs are not conducted. The road surface would continue to deteriorate, potentially causing damage to vehicles and increasing the chance of vehicle-related incidents. Traffic patterns would not be updated and improved.

3.3.3.2 Impacts of Alternative B – Repairs to Purvis Road:

To prevent the loss or movement of soils from the disturbed areas, E&SC measures would be implemented during construction. Approximately 25 acres of land would be disturbed to implement Alternative B. With implementation of proper E&SC measures, the action alternative is not expected to significantly impact on-site or area soils. E&SC plans and stormwater pollution prevention plans (SWPPP) are required to be submitted to the Water Program Manager, NREA Branch, MCBQ at least 70 days prior to work starting on the project.

3.4 Cultural Resources

This discussion of cultural resources includes prehistoric and historic archaeological sites; historic buildings, structures, and districts, and physical entities and human-made or natural features important to a culture, a subculture, or a community for traditional, religious, or other reasons. Cultural resources can be divided into three major categories:

- Archaeological resources (prehistoric and historic) are locations where human activity measurably altered the earth or left deposits of physical remains.
- Architectural resources include standing buildings, structures, landscapes, and other built-

environment resources of historic or aesthetic significance.

- Traditional cultural properties may include archaeological resources, structures, neighborhoods, prominent topographic features, habitat, plants, animals, and minerals that Native Americans or other groups consider essential for the preservation of traditional culture.

3.4.1 Regulatory Setting

Cultural resources are governed by other federal laws and regulations, including the National Historic Preservation Act (NHPA), Archeological and Historic Preservation Act, American Indian Religious Freedom Act, Archaeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1990. Federal agencies' responsibility for protecting historic properties is defined primarily by sections 106 and 110 of the NHPA. Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties. Section 110 of the NHPA requires federal agencies to establish - in conjunction with the Secretary of the Interior - historic preservation programs for the identification, evaluation, and protection of historic properties. Cultural resources also may be covered by state, local, and territorial laws.

Implementation of the proposed action must comply with the National Historic Preservation Act (NHPA) of 1966, (54 U.S.C. §300101 et seq.). Under the NHPA, consideration of historic preservation issues must be integrated into the early planning stages of project planning by federal agencies. Under NHPA 36 C.F.R. part 800 (Section 106), a federal agency is required to account for the effects of the proposed action on any district, site, building, structure, or object that is included or eligible for inclusion in the National Register of Historic Places (NRHP), prior to the expenditure of funds on the action. Under NHPA 54 U.S.C. §§306101(a) and 306102 (Section 110), the identification and evaluation of any cultural resources on federal property that meet the eligibility criteria of the NRHP is required.

3.4.2 Affected Environment

Architectural historians with the U.S. Army Construction Engineering Research Laboratory (USCERL) conducted a survey of Quantico buildings between 1992 and 1994 (USCERL 1994). They identified significant historic buildings and landscapes on the base. Seven themes forming the historic context for the subsequently nominated NRHP QMCBHD include: First Permanent Construction, Aviation, Education, Industrial, Naval Clinic, African American Barracks, and Lustron Housing.

3.4.2.1 Archaeological Resources

There are two sites located in the vicinity of the limits of disturbance. Both sites were surveyed in April 2020, and it was determined that neither will be affected by the road expansion. No adverse effect to cultural resources is anticipated. If cultural resources are found during earth disturbing activities, work will stop and the cultural resources manager (CRM) notified. The CRM is available to brief the contractors on what to be aware of during ground disturbing activities.

3.4.3 Environmental Consequences

The MCBQ CRM has reviewed the proposed action per the Programmatic Agreement Between the United States Marine Corps and the Virginia State Historic Preservation Office and determined that the project as planned would have no effect on archaeological or historic resources, or the QMCBHD.

3.4.3.1 Impacts of Alternative A – No Action:

This alternative would have no adverse effects upon the NRHP-eligible QMCBHD. Archeological resources would not be impacted.

3.4.3.2 Impacts of Alternative B - Repairs to Purvis Road:

The proposed repairs are not expected to have an impact on archaeological resources. Ground disturbing activities will be limited to areas which been determined to have no potential for significant archaeological resources. These areas have been previously disturbed. Cultural resources correspondence is at Appendix G.

For excavations permitted where there are no known archaeological sites or cemeteries, caution must still be used by contractors. Some areas are urban terrain and have been significantly modified or disturbed. However, there may be undisturbed soil zones encountered adjacent to or under previous disturbances/fill.

The demolition contractor should contact the base CRM (703-432-6781/0519) immediately if artifacts (e.g., metal tools, arrowheads, etc.) appearing to pre-date the 20th century or unusual soil zones are encountered during excavation.

In the event there are any unexpected discoveries of potential human remains (e.g., bones or bone fragments), work must be halted or diverted to other areas until appropriate measures are taken. Contract Project Managers must be informed that any human remains encountered are protected by state and federal law. The following procedures must be followed:

- Halt work at the location leaving remains in place and any associated features and objects
- Notify base CRM per Section 7.0 of this EA
- Redesign project to avoid remains, if possible
- The base CRM Section will contact the SHPO, and if remains are Native American will contact tribe(s)

Removal of remains requires a permit from the SHPO, including the participation of a skeletal biologist or physical anthropologist, and plans to make appropriate notifications to possible descendants/relatives and other measures in accordance with state law and Advisory Council on Historic Preservation (ACHP) guidelines.

3.5 Biological Resources

Biological resources include living, native, or naturalized plant and animal species and the

habitats within which they occur. Plant associations are referred to generally as vegetation, and animal species are referred to generally as wildlife. Habitat can be defined as the resources and conditions present in an area that support a plant or animal. Within this SEA, biological resources are divided into three major categories: (1) vegetation, (2) terrestrial wildlife, and (3) aquatic wildlife. Threatened, endangered, and other special status species are discussed in their respective categories.

3.5.1 Regulatory Setting

Special-status species, for the purpose of this EA, are those species listed as threatened or endangered under the Endangered Species Act (ESA) and species afforded federal protection under the Migratory Bird Treaty Act (MBTA).

The Endangered Species Act (ESA), 7 U.S.C. §136, 16 U.S.C. §1531 et seq., requires federal agencies to ensure that their actions will not jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of its critical habitat.

The Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. §701-12) protects all species covered by the four migratory bird treaties the United States signed with Canada, Mexico, Japan, and Russia. The MBTA prohibits taking (e.g., pursuing, hunting, shooting, wounding, trapping, capturing, or collecting, or attempting to pursue, hunt, shoot, wound, trap, capture, or collect, intentionally or unintentionally), killing, or possessing of migratory birds (including parts, feathers, nests, and eggs) unless permitted by the Secretary of the Interior. The United States Fish and Wildlife Service (USFWS) currently recognizes 832 species of migratory birds.

Per Executive Order 13186, Responsibilities of Federal Agencies to Migratory Birds (2001), the DoD and USFWS set forth a Memorandum of Understanding (MOU) to promote the conservation of migratory birds and their habitats. Habitat that would be considered critical to the natural history and/or life cycle of migratory birds is not located within the proposed development areas of Alternative B.

Bald eagles (*Haliaeetus leucocephalus*), which are afforded federal protection under the MBTA and the Bald and Golden Eagle Protection Act (BGEPA) of 1940, as amended (16 U.S.C. §668-668d, 54 Stat. 250), and are listed as a species of concern in the USFWS Birds of Conservation Concern, 2008, are discussed within the Terrestrial Wildlife section (3.5.2.2) of this SEA.

Marine Corps Order P5090.2A, Ch. 3 directs the USMC to comply with environmental requirements, protect the environment and human health, and enhance and sustain mission readiness, to include cooperating with the Commonwealth of Virginia to protect Virginia-listed rare species and to provide consideration of state-listed species during the NEPA process. According to Chief of Naval Operations Instruction (OPNAVINST) 5090.1B, it is Navy and Marine Corps policy to cooperate with states to protect state-listed species, if mission compatible. Hence, MCBQ also considers project impacts to Virginia-listed rare species and state listed species during the NEPA process.

The Virginia Piedmont waterboatman, *Sigara depressa*, and the brook floater, *Alasmodonta varicose*, are two Virginia-listed endangered faunal species. Both species are water dependent. The Virginia Piedmont waterboatman is an insect that inhabits ponds and extremely slow moving streams. The brook floater is a bivalve that is found among boulders within gravel or sand.

3.5.2 Affected Environment

The base supports a wide variety of both game and non-game species and a diversity of wildlife habitat is available. Game species include white-tailed deer, wild turkey, gray squirrel, cottontail rabbit and bobwhite quail. Non-game species include resident and migratory songbirds, raptors, and various reptiles, amphibians, and insects.

Migratory birds utilize a variety of habitats available throughout MCBQ including forestland, grassland, wetland, and riparian corridors. Since the original EA was prepared and original FONSI signed, additional animal species that occur or may occur at MCINCR-MCBQ have been federally-listed as threatened or endangered. These species include the rusty patched bumblebee, the Indiana bat, and the northern long-eared bat.

3.5.2.1 Vegetation

Two plant species on MCBQ are federally-listed as threatened or endangered species. These are Harperella (*Ptilimnium nodosum*) and the small whorled pogonia (*Isotria medeoloides*).

Harperella is a federally-listed endangered plant species native to riverine habitats. This plant is only found in 13 areas ranging from Maryland to Georgia.

The small whorled pogonia (SWP) is a federally-listed threatened species. The SWP is a perennial plant that generally occurs on gentle to moderate slopes with eastern or northern exposures and prefers acidic sandy loam soils with low nutrient content.

3.5.2.2 Terrestrial Wildlife

Two terrestrial animal species found or potentially found on portions of MCBQ are federally-listed as endangered: the Indiana bat (*Myotis sodalist*) and the rusty patched bumblebee (*Bombus affinis*). Three counties in Virginia have been designated within the “High Potential” or “Primary Dispersal Zone” for the rusty patched bumblebee: Clarke, Loudoun, and Fauquier. Part of the Westside of MCBQ lies in Fauquier County.

The Indiana bat can be found over most of the eastern half of the United States. The bat spends winter hibernating in caves and occasionally in abandoned mines (hibernacula). During summer, the bats prefer to roost under the peeling bark of dead and dying trees. There are no known Indiana bat hibernacula on MCBQ. The Indiana bat was detected on base during 2019.

The northern long-eared bat (*Myotis septentrionalis*) (NLEB) is also found on MCBQ. The NLEB is federally-listed as threatened. The bat spends winter hibernating in caves and mines.

They prefer roosting sites with constant temperatures, high humidity, and no air currents. In summer, they prefer roosts under tree bark, in cavities or in crevices of both live and dead trees, and rarely in man-made structures such as barns or sheds (50 C.F.R. part 17). There are no known NLEB hibernacula on MCBQ. The NLEB was detected on base during 2020.

The little brown bat (*Myotis lucigus*) and the tricolored bat (*Perymyotis subflavus*) are listed as state-endangered. Both species were detected on base during 2020.

The bald eagle was removed from the Federal List of Endangered and Threatened Wildlife and Plants in 2007 due to population recovery. The BGEPA requires a buffer of 660 feet around a nesting site. No nesting sites have been observed in the project area.

3.5.2.3 Aquatic Wildlife

Fish

Fish are vital components of aquatic ecosystems. They have great ecological and economic aspects. To protect this resource, the National Oceanic and Atmospheric Administration (NOAA) Fisheries works with the regional fishery management councils to identify the essential habitat for every life stage of each federally managed species using the best available scientific information. Essential fish habitat has been described for approximately 1000 managed species to date. Essential fish habitat includes all types of aquatic habitat, including wetlands, coral reefs, seagrasses, and rivers – all locations where fish spawn, breed, feed, or grow to maturity. Essential fish habitat has not been identified on MCBQ.

Invertebrates

One aquatic animal species, the dwarf wedge mussel (*Alasmidonta heterodon*), found on portions of MCBQ, is federally-listed as endangered. It is a small bivalve that lives in freshwater streams and requires highly oxygenated and silt-free waters.

3.5.3 Environmental Consequences

3.5.3.1 Impacts of Alternative A – No Action:

Under Alternative A, the proposed project would not occur and there would be no change or impacts to biological resources.

3.5.3.2 Impacts of Alternative B – Repairs to Purvis Road:

Initial consultation with the USFWS was submitted through their Information for Planning and Consultation (IPaC) online system. Documentation of the submittal is at Appendix H.

Bat detectors were employed in the project area from 20-27 May 2020. No federally-listed threatened or endangered species were detected in the proposed project area. Tree removals shall comply with time of year restrictions (TOYR) that include the breeding and pupping

seasons of both the federally-endangered Indiana bat and the federally-threatened NLEB. Tree removal will only occur from 16 September through 14 April to avoid potential impacts. No tree removal will occur from April 15 through September 15, inclusive.

The current maintained road shoulders that will be impacted are not considered potential SWP habitat. Surveys for the SWP were conducted in June 2020. No colonies of SWP are located in the proposed project area. Suitable habitat for the SWP has not been identified in the project area. This project is not proposed to occur in areas where the rusty-patched bumblebee could potentially be found. While it is possible that the NLEB may be found here in the summer, it would likely be roosting in trees within deciduous forests. The dwarf wedge mussel and harperella are not found in areas that would be affected by implementation of Alternative B.

Due to the scope of work and the required BMPs to protect water quality, there is no potential for the action alternative to adversely affect threatened and endangered species, or habitats used by these species. Repairs to Purvis Road would have no adverse effects on wildlife (including migratory birds) or wildlife habitat.

3.6 Land Use

This discussion of land use includes current and planned uses and the regulations, policies, or zoning that may control the proposed land use. The term “land use” refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. However, there is no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, labels, and definitions vary among jurisdictions. Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. There is a wide variety of land use categories resulting from human activity. Descriptive terms often include residential, commercial, industrial, agricultural, institutional, and recreational.

3.6.1 Regulatory Setting

In many cases, land use descriptions are codified in installation master planning and local zoning laws. Office of the Chief of Naval Operations Instruction (OPNAVINST) 11010.40 establishes an encroachment management program to ensure operational sustainment that has direct bearing on land use planning on installations. Additionally, the joint instruction OPNAVINST 11010.36C and Marine Corps Order (MCO) 11010.16 provides guidance administering the Air Installation Compatible Use Zone (AICUZ) program, which recommends land uses that are compatible with noise levels, accident potential, and obstruction clearance criteria for military airfield operations. OPNAVINST 3550.1A and MCO 3550.11 provide guidance for a similar program, Range AICUZ (RAICUZ). This program includes range safety and noise analyses, and provides land use recommendations which will be compatible with Range Compatibility Zones and noise levels associated with military range operations.

The Farmland Protection Policy Act (FPPA) is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but not water or urban built-up land.

3.6.2 Affected Environment

The following discussions provide a description of the existing conditions for each of the categories under land use resources at MCBQ.

3.6.2.1 Land Use Compatibility

MCBQ is not located within the coastal zone of Virginia. The Virginia Department of Environmental Quality is the lead agency for coastal management and is responsible for enforcing the State's federally approved coastal management plan.

3.6.3 Environmental Consequences

3.6.3.1 Impacts of Alternative A – No Action:

Under the no action alternative, the current footprint would remain “as is”. Road repairs and upgrades associated with the proposed project would not occur.

3.6.3.2 Impacts of Alternative B – Repairs to Purvis Road:

Hunting and hiking areas exist adjacent to and within 0.5 miles of the proposed project area. These areas would not be directly affected by the road repair activities. Any indirect impacts would be temporary and not significant or adverse. Alternative B would not have an adverse effect on hunting, fishing, or hiking opportunities aboard MCBQ.

3.7 Military Training and Airspace

This discussion of airspace includes current uses and controls of the airspace. The Federal Aviation Administration (FAA) manages all airspace within the United States and the U.S. territories. Airspace, which is defined in vertical and horizontal dimensions and also by time, is considered to be a finite resource that must be managed for the benefit of all aviation sectors including commercial, general, and military aviation.

3.7.1 Regulatory Setting

Specific aviation and airspace management procedures and policies to be used by the Navy are provided by OPNAVINST 3710.7, Naval Aviation Training and Operating Procedure Standardization. Applicable Marine Corps aviation and airspace management procedures are provided by MCO P3500.14G, Aviation Training and Readiness (T&R) Manual, Administrative.

Other applicable regulations regarding special use airspace management include specific FAA Orders.

FAA Order 1050.1E (issued July 16, 2015), Environmental Impacts: Policies and Procedures, provides FAA policy and procedures to ensure agency compliance with the requirements set forth in the CEQ regulations for implementing the provisions of the NEPA, Department of Transportation Order 5610.1C, Procedures for Considering Environmental Impacts, and other related statutes and directives (FAA 2006).

FAA Order JO 7400.2K (issued February 19, 2014), Procedures for Handling Airspace Matters, specifically Chapter 32, provides guidance to air traffic personnel to assist in applying the requirements in FAA Order 1050.1E to air traffic actions.

Special Use Airspace identified for military and other governmental activities is charted and published by the National Aeronautical Charting Office in accordance with FAA Order JO 7400.8Y (issued February 05, 2016) and other applicable regulations and orders.

3.7.2 Affected Environment

This project would occur along the length of Purvis Road, which runs generally north-south through an area of the mainside of MCBQ dominated by military housing, dependent schools and child care facilities, and housing administration facilities.

3.7.3 Environmental Consequences

Impacts of Alternatives A and B:

Implementation of either alternative would not have an impact on military training or airspace.

3.8 Noise

This discussion of noise includes the types or sources of noise and the associated sensitive receptors in the human environment. Noise in relation to biological resources and wildlife species is discussed in the Biological Resources section. Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and are sensed by the human ear. Sound is all around us. The perception and evaluation of sound involves three basic physical characteristics:

- Intensity – the acoustic energy, which is expressed in terms of sound pressure, in decibels (dB)
- Frequency – the number of cycles per second the air vibrates, in Hertz (Hz)
- Duration – the length of time the sound can be detected

The major sources of noise at MCBQ include aircraft, artillery, small arms, explosives, vehicles, heavy equipment, and machinery. Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although continuous and extended exposure

to high noise levels (e.g., through occupational exposure) can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise, perceived importance of the noise, its appropriateness in the setting, time of day, type of activity during which the noise occurs, and sensitivity of the individual.

Existing noise levels in the project area are primarily from the MCAF and the CSX railway line. Other noise contributions come from temporary construction activities, but these are minor. Ordnance used in live and simulated fire exercises, is generally conducted at ranges on the Guadalcanal side of the base, six miles or more from the project area. There would be no additional new sources of noise associated with the sites after demolition/construction activities.

3.8.1 Basics of Sound and A-Weighted Sound Level

The loudest sounds that can be detected comfortably by the human ear have intensities that are a trillion times higher than those of sounds that can barely be detected. This vast range means that using a linear scale to represent sound intensity is not feasible. The dB is a logarithmic unit used to represent the intensity of a sound, also referred to as the sound level. All sounds have a spectral content, which means their magnitude or level changes with frequency, where frequency is measured in cycles per second or Hz. To mimic the human ear's non-linear sensitivity and perception of different frequencies of sound, the spectral content is weighted. For example, environmental noise measurements are usually on an "A-weighted" scale that filters out very low and very high frequencies in order to replicate human sensitivity. It is common to add the "A" to the measurement unit in order to identify that the measurement has been made with this filtering process (dBA). In this document, the dB unit refers to A-weighted sound levels. Table 3-2 provides a comparison of how the human ear perceives changes in loudness on the logarithmic scale.

Noise levels from aircraft operations that exceed background noise levels at an airfield typically occur beneath main approach and departure corridors, in local air traffic patterns around the airfield, and in areas immediately adjacent to parking ramps and aircraft staging areas. As aircraft in flight gain altitude, their noise contributions drop to lower levels, often becoming indistinguishable from the background noise.

Table 3-2 Subjective Responses to Changes in A-Weighted Sound Levels

<i>Change</i>	<i>Change in Perceived Loudness</i>
3 dB	Barely perceptible
5 dB	Quite noticeable
10 dB	Dramatic – twice or half as loud
20 dB	Striking – fourfold change

Figure 3-1 (Cowan, 1994) provides a chart of A-weighted sound levels from typical noise sources. Some noise sources (e.g., air conditioner, vacuum cleaner) are continuous sounds that maintain a constant sound level for some period of time. Other sources (e.g., automobile, heavy truck) are the maximum sound produced during an event like a vehicle pass-by. Other sounds (e.g., urban daytime, urban nighttime) are averages taken over extended periods of time. A variety of noise metrics have been developed to describe noise over different time periods, as discussed below.

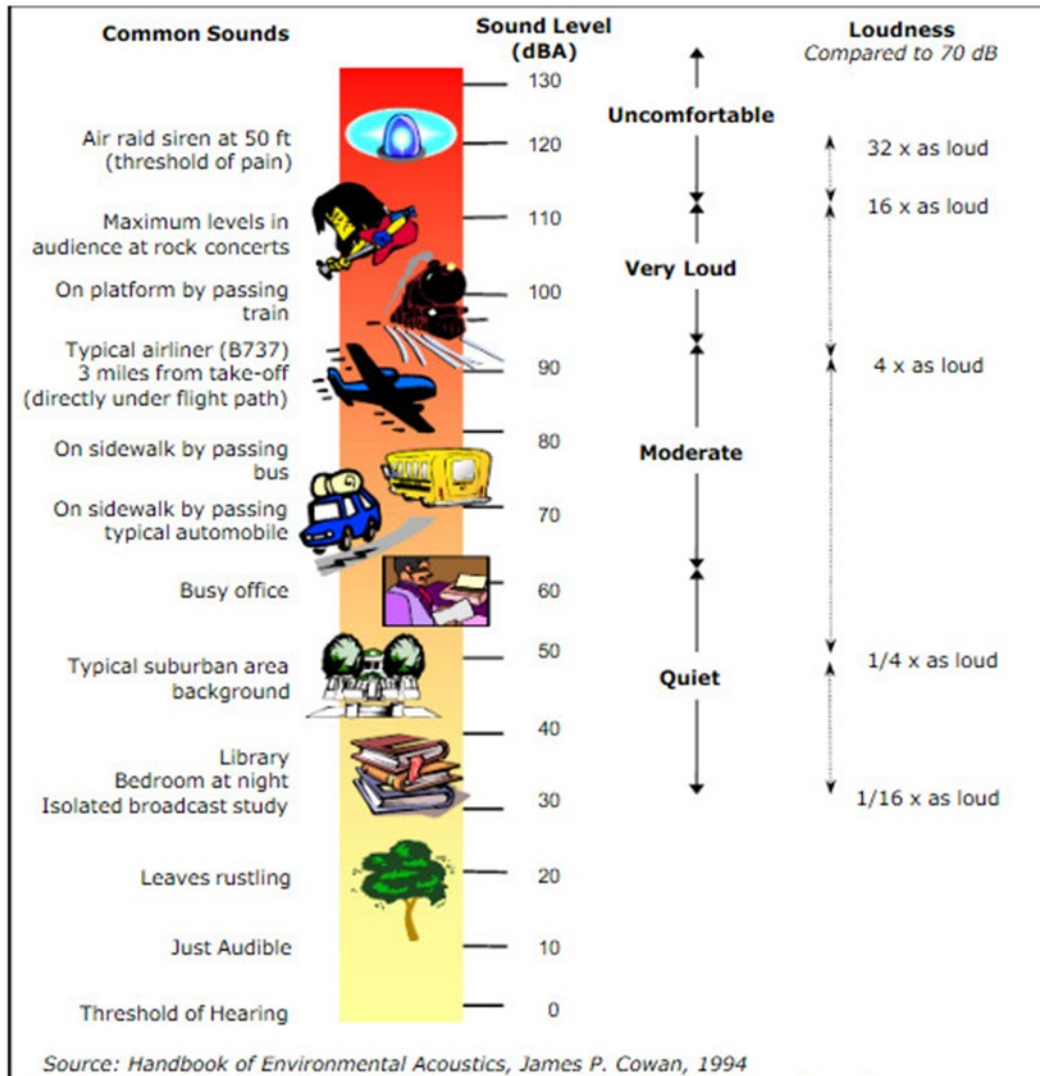


Figure 3-1 A-Weighted Sound Levels from Typical Sources

3.8.2 Noise Effects

An extensive amount of research has been conducted regarding noise effects including annoyance, speech interference, sleep disturbance, noise-induced hearing impairment, nonauditory health effects, performance effects, noise effects on children, effects on domestic animals and wildlife, property values, structures, terrain, and archaeological sites. These effects are summarized below.

3.8.3 Nonauditory Health Effects

Studies have been conducted to examine the nonauditory health effects of aircraft noise exposure, focusing primarily on stress response, blood pressure, birth weight, mortality rates, and cardiovascular health. Exposure to noise levels higher than those normally produced by aircraft in the community can elevate blood pressure and also stress hormone levels. However, the response to such loud noise is typically short in duration: after the noise goes away, the physiological effects reverse and levels return to normal. In the case of repeated exposure to aircraft noise, the connection is not as clear. The results of most cited studies are inconclusive, and it cannot be conclusively stated that a causal link exists between aircraft noise exposure and the various type of nonauditory health effects that were studied (DoD Noise Working Group, 2009).

3.8.4 Regulatory Setting

Under the Noise Control Act of 1972, the Occupational Safety and Health Administration (OSHA) established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 A-weighted decibels (dBA) over an 8-hour period. The highest allowable sound level to which workers can be constantly exposed is 115 dBA and exposure to this level must not exceed 15 minutes within an 8-hour period. The standards limit instantaneous exposure, such as impact noise, to 140 dBA. If noise levels exceed these standards, employers are required to provide hearing protection equipment that will reduce sound levels to acceptable limits.

The joint instruction, Chief of Naval Operations Instruction (OPNAVINST) 11010.36C and MCO 11010.16, Air Installations Compatible Use Zones (AICUZ) Program, provides guidance administering the AICUZ program which recommends land uses that are compatible with aircraft noise levels. OPNAVINST 3550.1A and MCO 3550.11 provide guidance for a similar program, RAICUZ. This program includes range safety and noise analyses, and provides land use recommendations which will be compatible with Range Compatibility Zones and noise levels associated with military range operations. Per OPNAVINST 11010.36C, NOISEMAP is to be used for developing noise contours and is the best noise modeling science available today for fixed-wing aircraft until the new Advanced Acoustic Model is approved for use.

3.8.5 Affected Environment

Many components may generate noise and warrant analysis as contributors to the total noise impact. The predominant noise sources consist of aircraft operations, both at and around the airfields, as well as in the airspace and on ranges. Other components such as construction, aircraft ground support equipment for maintenance purposes, and vehicle traffic produce noise, but such noise generally represents a transitory and negligible contribution to the average noise level environment. The federal government supports conditions free from noise that threaten human health and welfare and the environment. Response to noise varies, depending on the type and characteristics of the noise, distance between the noise source and whoever hears it (the receptor), receptor sensitivity, and time of day. A noise sensitive receptor is defined as a land use where people involved in indoor or outdoor activities may be subject to stress or

considerable interference from noise. Such locations or facilities often include residential dwellings, hospitals, nursing homes, educational facilities, and libraries. Sensitive receptors may also include noise-sensitive cultural practices, some domestic animals, or certain wildlife species. The nearest sensitive receptors are the elementary school, the middle/high school, and the child development centers (both North and South), which are located adjacent to the project site. Potentially noise-sensitive wildlife species are discussed in Section 3.5.

3.8.6 Environmental Consequences

Existing noise at and around the project area is largely attributed to activities associated with construction and/or demolition.

3.8.6.1 Impacts of Alternative A – No Action:

The no action alternative would not impact existing noise levels on the base or the surrounding area.

3.8.6.2 Impact of Alternative B – Repairs to Purvis Road:

Implementation of the proposed action would generate short-term, temporary noise from construction/demolition (i.e., noise from construction equipment, supply trucks, and worker vehicles). The proposed action alternative would not have a permanent increase on noise levels.

Noise associated with construction/demolition activities under Alternative B would be temporary. Given the type and duration of the noise to be generated, the ambient noise level adjacent to the project site, and the lack of noise sensitive receptors (i.e. homes, schools, and hospitals), noise generated by construction/demolition activities is not expected to result in significant noise impacts. No post-construction/demolition noise is expected at the site.

3.9 Infrastructure and Transportation

Purvis Road would be milled and repaved, and its shoulders widened and paved. No parking lots or parking structures will be demolished as a part of the proposed alternatives.

3.9.1 Regulatory Setting

EO 13693 encourages the coordination of federal real property discussions with local communities in an effort to encourage planned transportation investments that aim to support public transit access.

3.9.2 Affected Environment

Purvis Road runs generally north and south through the main side of MCBQ, with access from Fuller Road in the north and Russell Road in the south. Purvis Road is used primarily by military personnel who are residents in base housing, their families and guests, and civilian personnel who perform various functions on base.

3.9.3 Environmental Consequences

3.9.3.1 Impacts of Alternative A – No Action:

The conditions of Purvis Road would continue to deteriorate, potentially causing vehicle damage from accidents and debris.

3.9.3.2 Impacts of Alternative B – Repairs to Purvis Road:

The proposed action alternative would have an impact on traffic, but this impact is considered temporary and would not be significant. Road demolition and construction crews associated with this project would not create a significant impact on traffic or parking availability.

3.10 Public Health and Safety

This discussion of public health and safety includes consideration for any activities, occurrences, or operations that have the potential to affect the safety, well-being, or health of members of the public. A safe environment is one in which there is no, or optimally reduced, potential for death, serious bodily injury or illness, or property damage. The primary goal is to identify and prevent potential accidents or impacts on the general public. Public health and safety within this EA discusses information pertaining to community emergency services, construction activities, operations, and environmental health and safety risks to children.

Community emergency services are organizations which ensure public safety and health by addressing different emergencies. The three main emergency service functions onboard MCBQ include police, fire and rescue service, and emergency medical service.

Public health and safety during construction, demolition, and renovation activities is generally associated with construction traffic, as well as the safety of personnel within or adjacent to the construction zones.

Operational safety may refer to the actual use of the facility or built-out proposed project, or training or testing activities and potential risks to inhabitants or users of adjacent or nearby land and water parcels. Safety measures are often implemented through designated safety zones, warning areas, or other types of designations.

Environmental health and safety risks to children are defined as those that are attributable to products or substances a child is likely to come into contact with or ingest, such as air, food, water, soil, and products that children use or to which they are exposed.

3.10.1 Regulatory Setting

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, requires federal agencies to “make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children and shall ensure that its

policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.”

Many portions of MCBQ consist of historic munitions impact sites. The proposed project location is not an identified munitions response/unexploded ordnance (UXO) or an installation remediation area.

3.10.2 Affected Environment

Part of this project takes place within the boundaries of UXO 021, an open Munitions Response Site. There is on-going fieldwork in this area as part of the Remedial Investigation phase.

3.10.3 Environmental Consequences

3.10.3.1 Impacts of Alternative A – No Action:

This alternative would maintain the status quo and would not have additional effects on health and safety.

3.10.3.2 Impacts of Alternative B – Repairs to Purvis Road:

An ESSDR has been recommended, along with UXO tech support, UXO awareness training, and an After Action Report.

According to the MCO 5090.2A. Ch. 3, Chapter 10, Section 2, Paragraph 10221, if contamination is discovered during construction and it is Defense Environmental Restoration Program (DERP) eligible, NAVFACENGCOM can carry out the site investigation/cleanup using ER,N funds. However, the site will compete with other ER sites based on risk management. If ER,N funding is not available in time to meet the construction schedule, the installation must use project funds to investigate/clean up the site.

3.11 Hazardous Materials/Wastes and Solid Waste

MCBQ is located in three counties. According to the United States EPA's Map of Radon Zones, Stafford County is located in Zone 1 and Prince William and Fauquier Counties are located in Zone 2. Zone 1 counties have a predicted average radon screening level greater than 4 picocuries per liter (pCi/L), and Zone 2 counties have a predicted average radon screening level between 2 and 4 pCi/L. Historic data and geologic conditions indicate there is a high risk of radon being present in buildings at MCBQ above the action level of 4 pCi/L.

Many portions of MCBQ consist of historic munitions impact sites. The proposed action would take place within or near a known Munitions Response Site or former impact area. Excavation activities may expose lead or other munitions constituents during excavating activities.

According to the Marine Corps Order 5090.2A Ch. 3, Chapter 10, Section 2, Paragraph 10221:

“All efforts must be made to ensure that Marine Corps’ projects are not constructed on contaminated sites. However, there may be times when the project is being planned or is underway and contamination is discovered.

1. If contamination is discovered during the planning stage, Naval Facilities Engineering Command (NAVFAC) can investigate and determine the need for clean up using Environmental Restoration Program, Navy (ER,N) funds and following environmental restoration (ER) procedures. However, the site investigation/clean-up must compete with other ER sites based on risk management. In most cases, this will take several years and the site may not be available in time for the project.

2. If contamination is discovered during construction and it is Defense Environmental Restoration Program (DERP) eligible, NAVFAC can carry out the site investigation/cleanup using ER,N funds. However, the site will compete with other ER sites based on risk management. If ER,N funding is not available in time to meet the construction schedule, the installation must use project funds to investigate/clean up the site. If neither ER,N nor project funding is available in time to meet the construction schedule, the installation must stop the project altogether or re-site it. An installation does not have an option to pay for any DERP-eligible work with installation Navy Operations and Maintenance (OM,N) funds except to accomplish DERP-eligible work within the scope of an OM,N funded construction project.”

The solid waste contained in the respective sections addresses issues related to the use and management of solid waste at MCBQ.

3.11.1 Regulatory Setting

Executive Order 13514, Leadership in Environmental, Energy, and Economic Performance, 2009, calls for meeting or exceeding fifty percent diversion of non-hazardous solid waste and construction and materials and debris from landfills by fiscal year 2015.

3.11.2 Affected Environment

Purvis Road traverses through an area that was historically a military range. The predominant use more recently has been for housing, and military dependent schools and day care facilities.

3.11.3 Environmental Consequences

There is no adverse impact from hazardous materials/waste or solid waste anticipated with this project.

3.11.3.1 Impacts of Alternative A – No Action:

This alternative would have no effect on general procedures and practices for hazardous material removal, hazardous waste management, or solid waste management at MCBQ.

3.11.3.2 Impacts of Alternative B – Repairs to Purvis Road:

This alternative would result in construction demolition debris (CDD) and waste. Reports of waste generated (including recycling) including material type (CDD, concrete, scrap metal, used oil, etc.), tons, disposal destination, and disposal cost shall be reported via the Construction Waste Management Report to NREA within 30 days of the close of the project, and no later than October 15, to be included in annual report submissions (form is at Appendix I). All spoils and debris generated by the demolition operation shall be transported off base and disposed of in accordance with all federal, state, and local regulations.

The demolition contractor is responsible for coordinating all solid waste disposal at a landfill that meets all Federal, State, and local regulatory standards. The contractor will support the solid waste diversion philosophy outlined in E.O. 13514 by recovering/recycling.

Neither alternative would have an effect on general procedures for removal of hazardous materials and hazardous waste management at MCBQ. No hazardous materials would be introduced under either of the alternatives.

3.12 Environmental Justice

Executive Order (EO) 12898, *Federal Actions to address Environmental Justice in Minority Populations and Low-income Populations*, was issued in 1994. This order directs agencies to address environmental and human health conditions in minority and low-income communities so as to avoid the disproportionate placement of any adverse effects from federal policies and actions on these groups. The proposed action will not involve effects specific to minority or low-income populations.

EO 13045, *Protection of Children from Environmental Health and safety Risk*, was issued in 1997. This order requires agencies, to the extent permitted by law and mission, to identify and assess environmental health and safety risks that might disproportionately affect children. The proposed action will not involve effects specific to children.

3.12.1 Affected Environment

The proposed project area is dominated by housing for active duty military families, schools for military dependents, and child care facilities.

3.12.2 Environmental Consequences

Impacts of Alternative A or B:

Implementing either of the proposed alternatives would not be expected to significantly impact the socioeconomics or create disproportionately high and adverse human health or environmental effects to minority, low-income populations, or children at MCBQ or in the surrounding area. This project will have temporary minor impacts such as noise created by road construction activities, and these impacts will not disproportionately affect minority, low-income populations,

or children. Best management practices such as dust management would also be employed to eliminate or keep temporary environmental nuisances to a minimum.

4.0 Cumulative Impacts

This section defines cumulative impacts, describes past, present, and reasonably foreseeable future actions relevant to cumulative impacts, analyzes the incremental interaction the proposed action may have with other actions, and evaluates cumulative impacts potentially resulting from these interactions.

4.1 Definition of Cumulative Impacts

For NEPA analysis, a cumulative impact is defined as the impact on the environment, which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future action. Impacts can result from individually minor but collectively significant actions taking place over a period of time.

4.2 Past, Present, and Reasonably Foreseeable Actions

4.2.1 Past Actions

- Construction of Military Housing/Public Private Venture
- Construction of a Consolidated Elementary School
- Construction of a Child Development Center
- Realignment of the Purvis Road/Russell Road intersection
- U.S. Route 1 Widening (Virginia Department of Transportation)

4.2.2 Present and Reasonably Foreseeable Actions

- Construction of a Middle/High School
- Construction of a Front Gate at Fuller Road
- Fuller Road Widening
- Development at Marine Corps University, including several construction and demolition projects

4.2.3 Future projects

- Cherry Hill Third Track
- Little Creek Repairs and Remediation

4.3 Cumulative Impact Analysis

Mitigation measures similar to those outlined in this SEA for repairs to Purvis Road will or have been completed for the above mentioned projects as necessary. Consultation with the SHPO is also completed for all construction and demolition projects at MCBQ as applicable.

5.0 References

40 CFR parts 1500-1508, Council on Environmental Quality.

50 CFR part 17, Department of the Interior, Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Northern Long-Eared Bat With 4(d) Rule; Final Rule and Interim Rule, Vol. 80, No. 63, Thursday, April 2, 2015.

Bald and Golden Protection Eagle Act, 1940 (16 U.S.C. §668-668d, 54 Stat. 250).

Chesapeake Bay Preservation Act, 1988 (Code of Virginia, Title 10.1-Conservation, Chapter 21).

Clean Air Act, 1970 (42 U.S.C. §7401 et seq., as amended in 1977 and 1990).

Clean Water Act, 1972 (33 U.S.C. §1251 et seq.).

Coastal Zone Management Act, 1972 (16 U.S.C. §1451, et seq., as amended).

Endangered Species Act, 1973 (7 U.S.C. §136, 16 U.S.C. §1531 et seq.).

Executive Order (E.O.) 11988, *Floodplain Management*, 1977.

E.O. 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*, 1994.

E.O. 13045, *Protection of Children from Environmental Health and Safety Risk*, 1997.

E.O. 13186, *Responsibilities of Federal Agencies to Migratory Birds*, 2001.

E.O. 13514, *Leadership in Environmental, Energy, and Economic Performance*, 2009.

Intergovernmental Panel on Climate Change (IPCC), 2007.

Mandatory Reporting of Greenhouse Gases rule (40 C.F.R. Part 98), Environmental Protection Agency, 2009.

Marine Corps Order 5090.2, 2018.

Marine Corps Order 11010.16, 2008.

Migratory Bird Treaty Act, 1918 (16 U.S.C. §701-12).

National Environmental Policy Act, 1969 (42 U.S.C. §4321 et seq.).

National Historic Preservation Act, 1966 (54 U.S.C. §300101 et seq.).

Natural Resources and Environmental Affairs Branch (NREA) 2007. Integrated Cultural Resource Management Plan for Marine Corps Base, Quantico, Virginia. Natural Resources and Environmental Affairs Branch, Marine Corps Base Quantico, VA.

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Virginia Department of Conservation and Recreation (VDCR) 1992. *Virginia Erosion and Sediment Control Handbook*, Richmond, VA.

7.0 List of Preparers

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Mr. John Rohm, Natural Resources Section Head
Ms. Christa Nye, Fish, Wildlife, & Agronomy Section Head
Mr. Ronald Moyer, Forestry Section Head
Mrs. Catherine Roberts, Cultural Resources Manager
Ms. Abbigale Andersen, Air Program Contractor
Mr. Jonmark Sullivan, Water Program Manager
Mr. David Norris, Hazardous Waste Program Manager
Mr. Brian Ventura, Chemist/Hazardous Materials Program Manager
Ms. Marilisa Porter, Solid Waste Program Manager
Mr. Rodney Aguirre, Munitions Response and Installation Restoration Program Manager
Mr. James Hewitt, Assistant Counsel

Appendix A
Original Finding of No Significant Impact

DECISION NOTICE
AND
FINDING OF NO SIGNIFICANT IMPACT
FOR PURVIS ROAD IMPROVEMENTS
MARINE CORPS BASE QUANTICO

Pursuant to Council on Environmental Quality Regulations (40 CFR 1500-1508) implementing the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et. seq.) and Marine Corps Order P5090.2A, a Finding of No Significant Impact is hereby provided. This finding is the result of an Environmental Assessment (EA) that evaluated the impacts on the natural and human environments for alternatives to the Purvis Road Improvements aboard Marine Corps Base Quantico. A public notice and comment period for the draft EA was initiated on December 27, 2013 and no comments were received.

DESCRIPTION OF THE ACTION

The Environmental Assessment evaluated the requirement to correct several road deficiencies identified in a January 2013 road conditions study. The no action alternative and one action alternative were detailed as part of the evaluation.

ALTERNATIVES

Alternative A: (No Action Alternative)

Under Alternative A, no improvements or repair projects would be implemented to correct drainage, erosion, and safety issues identified in a road conditions study along Purvis Road. Alternative A is not the preferred action as corrections would not be made. Poor drainage has created ponding, soft shoulders, and soil erosion, potentially undermining the road's integrity. Poor line-of-sight distances create safety concerns.

Alternative B: (Improvements to Purvis Road)

Alternative B provides for several phased improvements to Purvis Road. The goal of the proposed enhancements is to improve stormwater management in the area, correct severe erosion, and provide safer road conditions. Improvements include new bio-retention swales and facilities, replacement/relocation of culverts, restoration/replacement of damaged headwalls, re-grading drainage ditches, re-vegetation of bare soil, widening of roadway and extension of shoulders, horizontal and vertical road realignment, relocation of utility poles, and the construction of new outfall pipes. This is the action proponent's preferred alternative. Alternative B is also the environmentally preferred alternative.

ANTICIPATED ENVIRONMENTAL EFFECTS OF PREFERRED ALTERNATIVE

Water Quality and Aquatic Resources

Several wetlands and streams are adjacent to Purvis Road. Potential impacts may occur with culvert replacement/removal and rip rap placement. It is expected that approximately six stream impacts and four wetland impacts will result from modifications for bank/culvert stabilization. Appropriate United States Army Corps of Engineers

(USACE) and Virginia Department of Environmental Quality (DEQ) permits will be obtained for culvert extensions, additional rip rap placement, and bank stabilization. All avoidance and minimization measures (bottomless culverts, flushing and reusing existing culverts, etc.) must be examined and used if practicable. If impacts are unavoidable, mitigation will be completed.

All stream and wetland impacts of this project will be permitted together unless the phases of the project can be considered individual and complete projects. If the phases are interdependent, permitting must occur concurrently to avoid segmentation.

The project will not require fill within the 100-year floodplain but would involve land disturbance within designated 100-foot buffer Resource Protection Areas (RPA). Road projects are conditionally exempt from RPA regulations per DEQ regulations and require proper Best Management Practices (BMPs) and engineering practices be followed in order to minimize impacts to the RPA.

Bioretention areas and swales are proposed within the concept plan and are compliant with Low Impact Development (LID) requirements.

The proposed action alternative is consistent to the maximum extent practicable with the enforceable policies of Virginia's Coastal Zone Management Program.

Cultural Resources

Three archaeological sites are located on the north side of Purvis Road. According to concept plans, ground disturbance will not occur within the known archaeological sites. The site boundaries will be flagged prior to land disturbance to ensure the contractor avoids inadvertent disturbances of the sites.

This project occurs outside of the National Register of Historic Places listed MCBQ Historic District and will not affect historic properties.

Biological Resources

The action alternative is compliant with the Migratory Bird Treaty Act and the Bald and Golden Eagle Act. Significant habitat used by birds will not be affected.

Limited tree clearing will occur to correct line of sight deficiencies along existing driveways along Purvis Road and for the potential stormwater management facility adjacent to the utility easement north of the Youth Center. Potential small-whorled pogonia habitat does not exist adjacent to Purvis Road due to the regularly maintained overhead utility line and road right of way. Sensitive habitats will not be removed as a part of this project.

Water resources that support the dwarf wedge mussel, harperella, sensitive joint-vetch, waterboatman, and brook floater will not be affected. BMPs will be followed to avoid water quality degradation during construction and to avoid downstream sediments.

Land Use

Minor vegetation clearing will be required for selective road/shoulder widening and stormwater facilities. Preliminary soil evaluations have revealed that the existing underlying soils along Purvis Road may be largely unsuitable for road construction. Soil amendments may be required as a part of Alternative B.

Removal of infrequent over story trees near Purvis Road is unlikely due to the maintained right of way along the road. Landscape plantings must be compliant with the Base Exterior Architecture Plan. Invasive species will not be planted because of this project.

Air Quality and Climate Change

The action alternative would not significantly impact the current air quality conditions at MCBQ or within the Metropolitan Washington non-attainment area. The proposed action would have minor emissions resulting from the use of construction equipment. The goal of the proposed action alternative will not create a larger volume of traffic; rather, it will more safely carry the same pre-construction traffic volume.

This project does not propose new combustion units and would not affect the MCBQ's Title V Operating Permit. Annual emissions statements will continue to be submitted as required by the permit.

The proposed action alternative will not have significant air quality impacts or significantly contribute to cumulative impacts on Green House Gases or climate change.

Health and Safety

A portion of the proposed project (approximately 0.5 mile) is within Munitions Response Site UXO 021, Combat Area C Field Firing Range. Munitions have not been cleared from this site. Prior to any land disturbance in this area, an Explosive Safety Determination Request must be submitted to Marine Corps Systems Command (MARCORSYSCOM), Program Manager for Ammunition to determine requirements for clearance of the project area before work can begin. It is recommended that land disturbance be eliminated or reduced in this area, if possible. In addition to the above stated munitions clearance requirements, it is possible that a briefing by Explosive Ordnance Disposal will be required for the demolition and construction contractor(s). Contractors must ensure that necessary precautions are taken and that there is a plan of action should munitions be discovered during excavation activities.

Hazardous Materials/Waste and Solid Waste

Land disturbances associated with Alternative B may uncover unexploded ordnance (UXO) and expose lead or other hazardous munitions constituents. Construction guidelines must include provisions to be alert for contamination and to follow procedures that would assure health and safety of personnel should hazardous materials/waste be discovered.

All solid waste activities will be covered in the project solid waste management plan. The contractor is responsible for coordinating all solid waste disposals at a landfill that meets all Federal, State, and local regulatory standards. The contractor will support the solid waste diversion philosophy outlined in Executive Order 13514 by recovering/recycling.

Infrastructure/Transportation

Alternative B would correct exposed fiber optic/communications lines along Purvis Road caused by erosion. Utility relocation will be required in road areas that need to be widened to meet minimum width standards. The relocation of several utility poles to improve the line-of-sight distance will occur under Alternative B. MCBQ will coordinate these relocations with the utility owners.

Purvis Road is the access road to the Lyman Park housing area, the Child Development Centers, Youth Center, schools, the veterinary clinic, the antenna farm and dog kennel. All of these areas would be temporarily affected by lane closures during construction. This project will occur in many phases and lane closures should be coordinated to mitigate impacts to MCBQ residents and personnel who utilize services along Purvis Road.

With proper coordination with utility owners and the MCBQ population, impacts to users of Purvis Road will be likely but temporary in nature.

Noise

Implementation of the proposed action would generate short-term, temporary noise from construction operations (i.e., noise from construction equipment, supply trucks, and worker vehicles). The proposed action alternative would not have a permanent increase on noise levels. Noise generated from the use and operation of the proposed road improvements would be similar to current levels.

Military Training

Purvis Road is not used as a military training area. This area consists of housing and community services. Alternative B will not cause impacts to military training.

Recreation

Archery hunting is allowed adjacent to the Purvis Road area. Hunting parking areas numbers three and eight are accessed via Purvis Road. In the event temporary closures are in place to facilitate road work,

nearby parking lots two and eight could be used. Additionally, temporary sidewalk closures may be required for realignment. Pedestrian detours should be established to facilitate foot traffic of the Lyman Park residents.

Access to the athletic field west of the veterinary clinic might be temporarily altered as work on the vertical curve correction and parking lot is accomplished. Minor and temporary impacts to residents and hunters would occur but will be mitigated through public notification.

Socioeconomics and Environmental Justice

Implementing any of these proposed alternatives would not be expected to significantly impact socioeconomics or create disproportionately high and adverse human health or environmental effects to minority, low-income, or children at MCBQ or in the surrounding area. The action alternative will not displace anyone living in the Lyman Park housing area or operating/utilizing any of the services along Purvis Road. While the proposed project would occur in close proximity of children, the project would not adversely affect the health of these children. Alternative B would allow for safer driving conditions and would have a positive effect on safety.

This project will have temporary minor impacts such as noise created by construction activities and these impacts will not disproportionately affect children. Best management practices such as dust management would also be employed to eliminate or minimize temporary environmental nuisances.

MITIGATION MEASURES/FURTHER ACTIONS REQUIRED

The following mitigation measures will be employed to address potential impacts from the proposed project:

The contractor will submit a Joint Permit Application or the appropriate Nationwide Permit preconstruction notification. Mitigation credits, if required, will need to be purchased at an approved mitigation bank within the same hydrologic unit as the project site. The estimated total area of wetlands and streams to be impacted is less than 0.1 acre. Mitigation will need to be funded by the project proponent and accounted for throughout budget planning.

Mitigation must be purchased through an approved mitigation bank within the Lower Potomac (02070011) hydrologic unit. Palustrine forested (PFO) wetlands will be required to be mitigated at a 2:1 ratio and palustrine emergent (PEM) wetlands will need to be mitigated at a 1:1 ratio unless otherwise indicated by regulatory agencies. Streams must be mitigated based upon a Unified Stream Methodology assessment.

The implementation of basic erosion and sediment control practices will be required during construction as specified in the Virginia Erosion and Sediment Control Handbook (VDCR 1992). Proper installation and maintenance of erosion and sediment controls must

occur to prevent movement of disturbed soils off-site and into the Potomac River watershed. The project must provide no net increase in volume or nutrient loadings per the Energy Independence and Security Act (EISA) Section 438 and the Navy's LID Policy. The project will require a Virginia Stormwater Management Program (VSMP) permit issued through the Virginia DEQ. The project will require that an erosion and sediment (E&S) control plan and a Stormwater Pollution Prevention Plan (SWPPP) be submitted to the NREA Water Program at least 70 days prior to the start of land disturbance. The E&S control plan and SWPPP must be approved by NREA before the VSMP permit is issued by the state of Virginia. The NREA *Erosion and Sediment Control, Stormwater Pollution Prevention and Low Impact Development (LID) on MCBQ* (2013) application and design guidance document should be followed to eliminate approval delays.

The three archaeological sites immediately adjacent to Purvis Road will be field flagged and identified to the contractor prior to the start of work. It is the project proponent's responsibility to contact NREA's Cultural Resources Manager (CRM) prior to land disturbance near the archaeological sites. Additionally, NREA will periodically monitor work within these areas. If site plans change and avoidance of these sites is not possible, a Phase II archaeological survey will need to be completed by the MCBQ CRM. The project proponent must inform NREA if plans change and potential impacts will be required.

NREA NEPA personnel will periodically examine excavations during the construction period to examine soil stratigraphy for general information and possible resource issues in areas of interest. The contractor should contact the Base Archaeologist/NEPA Section immediately if artifacts (metal tools, arrowheads, etc.) appearing to pre-date, the 20th century or unusual soil zones are encountered.

In the event there are any unexpected discoveries of potential human remains (e.g. bones, bone fragments), work must be halted or diverted to other areas until appropriate measures are taken. Contract Project Managers must be informed that state and federal laws protect any human remains encountered. The procedures within Section 4.4 of the EA must be followed.

The contractor must follow BMPs for dust reduction. The proposed project will occur within a residential/community area.

The project proponent is responsible for coordinating with MARCORSYSCOM's Project Manager for Ammunition regarding the Explosive Safety Determination Request and any subsequent site clearance, monitoring by a UXO technician, EOD briefing, or other similar prescribed safety mitigations. Funding must be provided within the project budget to accomplish these tasks.

The project proponent/contractor is responsible for adhering to the planting guidance included in the Base Exterior Architecture Plan. The contractor must submit a Waste Management Plan prior to the start of construction and the Construction Waste Management Report to NREA by October 15 or within 30 days of the project close.

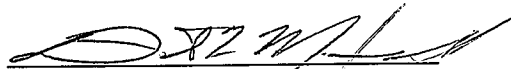
FINDINGS

Alternative A, the no action alternative, is not the preferred option as Purvis Road issues identified in the January 2013 conditions report would not be corrected. Alternative B is the preferred option and would allow for Purvis Road improvements to correct erosion and safety issues. Due to no significant impact of the proposed action (Alternative B), preparation of an Environmental Impact Statement is not required.

DOCUMENT AVAILABILITY. The EA for this project, the original copy of this document, and comments received are available for review at the Natural Resources and Environmental Affairs Office, Building 3049, Marine Corps Base Quantico, Virginia.

APR 06 2014

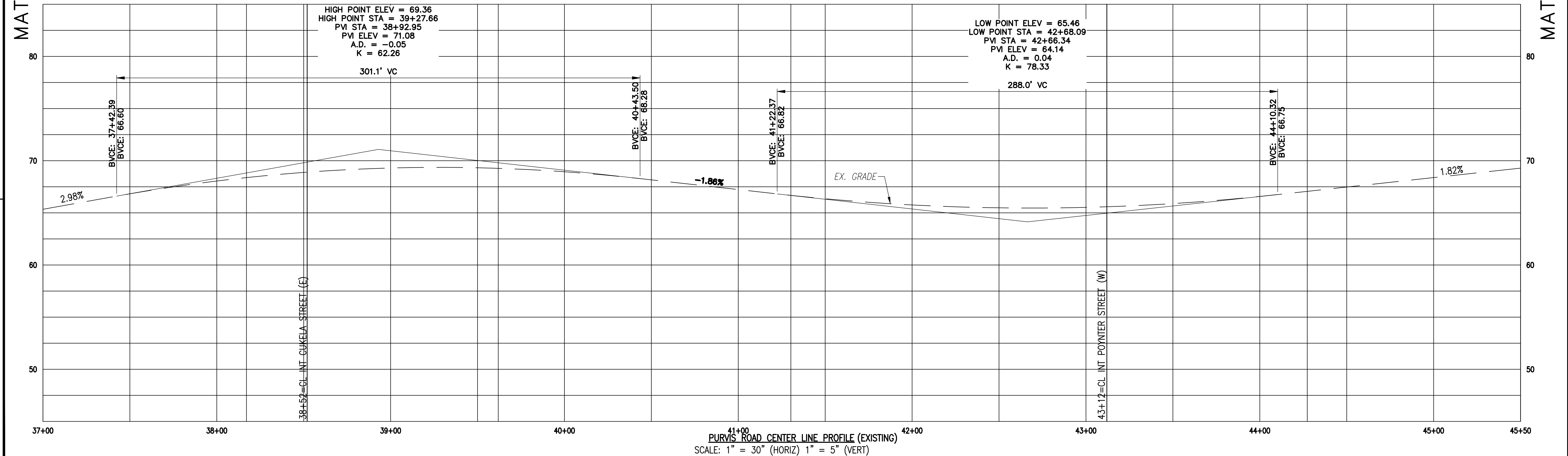
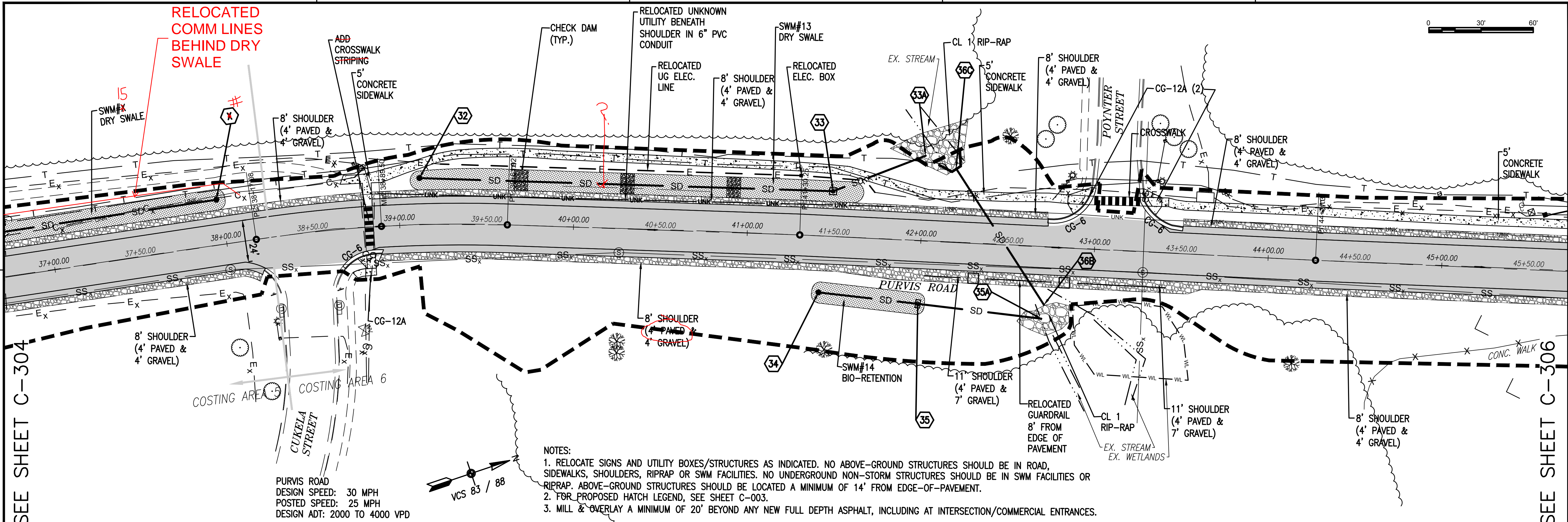
(DATE)



David W. Maxwell
Colonel, U.S. Marine Corps
Commander
Marine Corps Base Quantico

Appendix B
Project Location Maps and Site Plans

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FINAL SUBMISSION	8/5/2020	DATE	APPR
SYN	DESCRIPTION	DATE	APPR

COMMONWEALTH OF VIRGINIA
ASHLEY R. BEESAM
Lic. No. 043700
PROFESSIONAL ENGINEER

ADTEK
CIVIL/STRUCTURAL/GEOTECHNICAL ENGINEERS
3900 Fairfax Boulevard, Suite 300
Fairfax, Virginia 22030
Phone: 703-691-4040 Fax: 703-691-4056
www.ADTEKengineers.com

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

SATISFACTORY TO DATE

DES AB DRW AT,KG CHK AB

PM/DM

BRANCH MANAGER

CHIEF ENG/ARCH

FIRE PROTECTION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND - WASHINGTON
NAVFAC WASHINGTON
QUANTICO MARINE CORPS BASE
QUANTICO, VA

REPAIR PURVIS ROAD

PLAN AND PROFILE-5

SCALE: 1"=30'

PROJECT NO.: QU149100M

CONSTR. CONTR. NO. N40080-15-D-0154

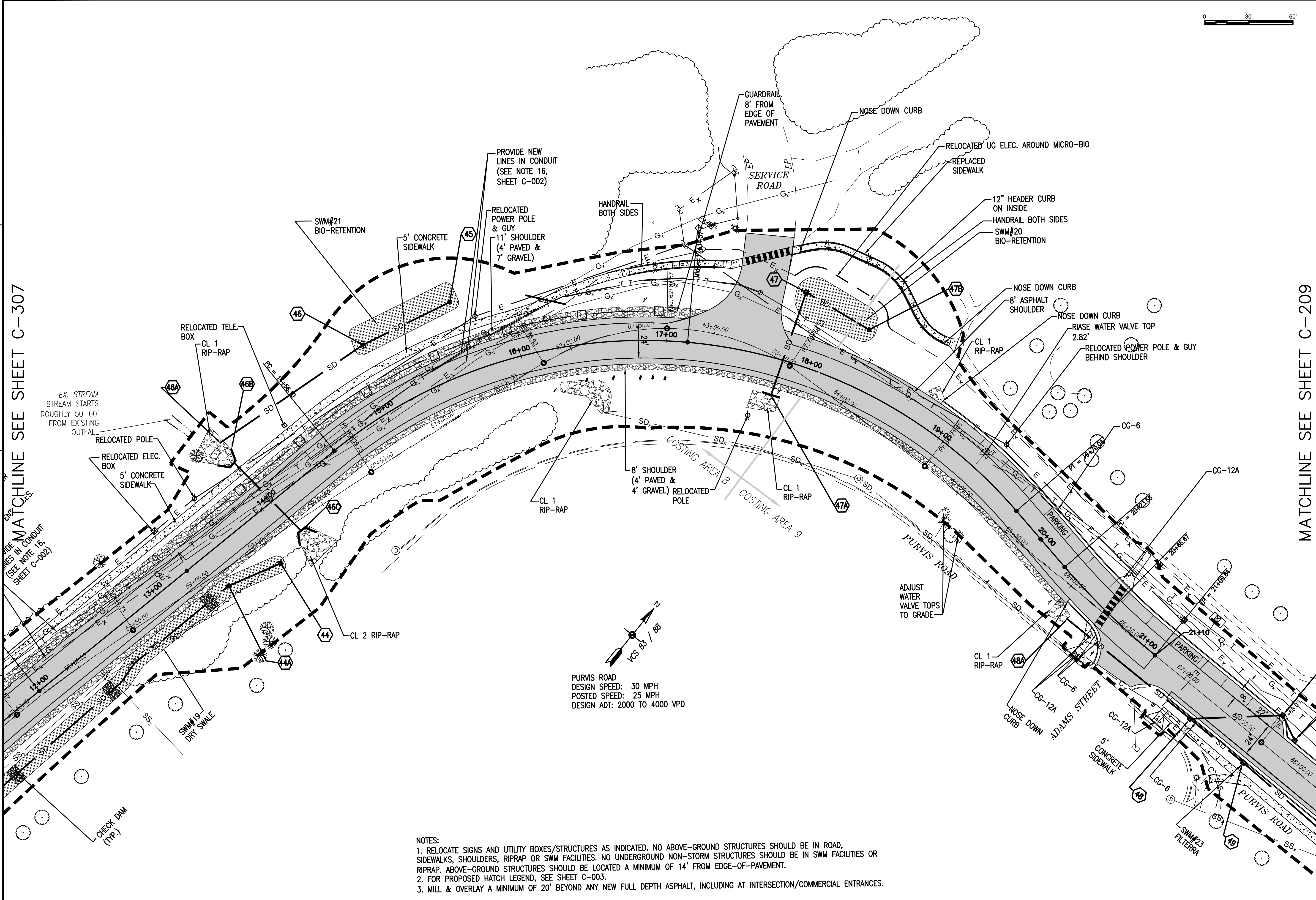
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DRAWING REVISION: 31 JANUARY 2017

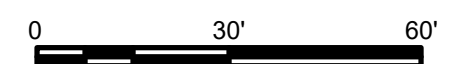
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SEE SHEET C-307
MATCHLINE
SEE SHEET C-307






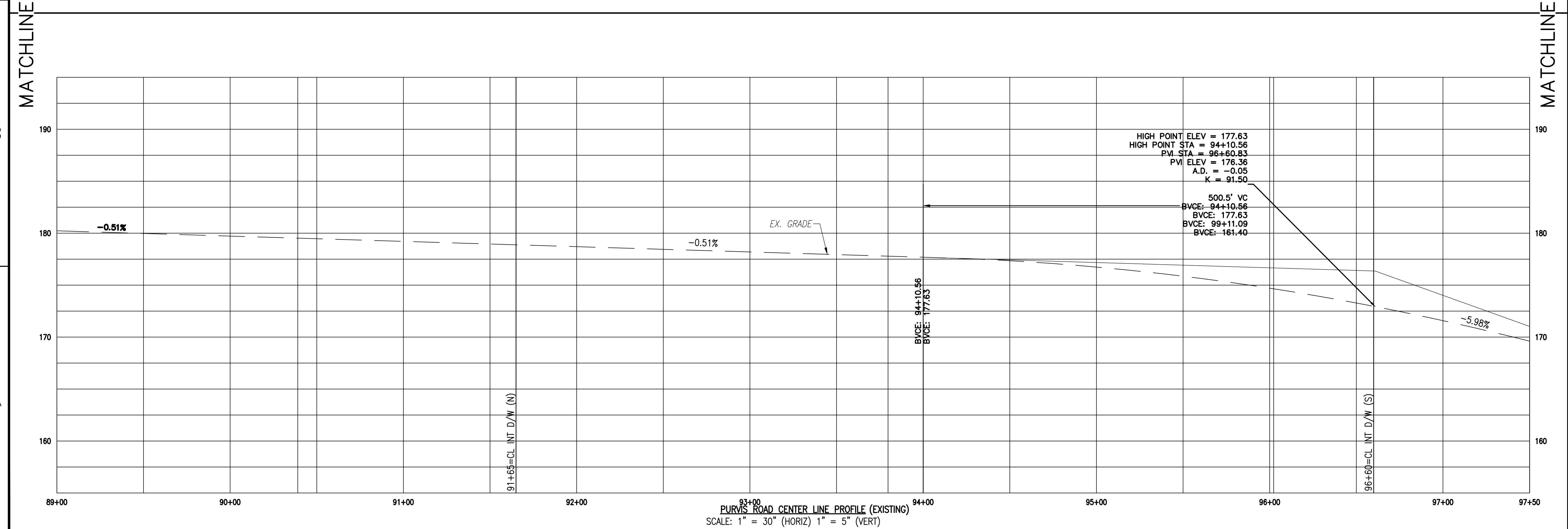
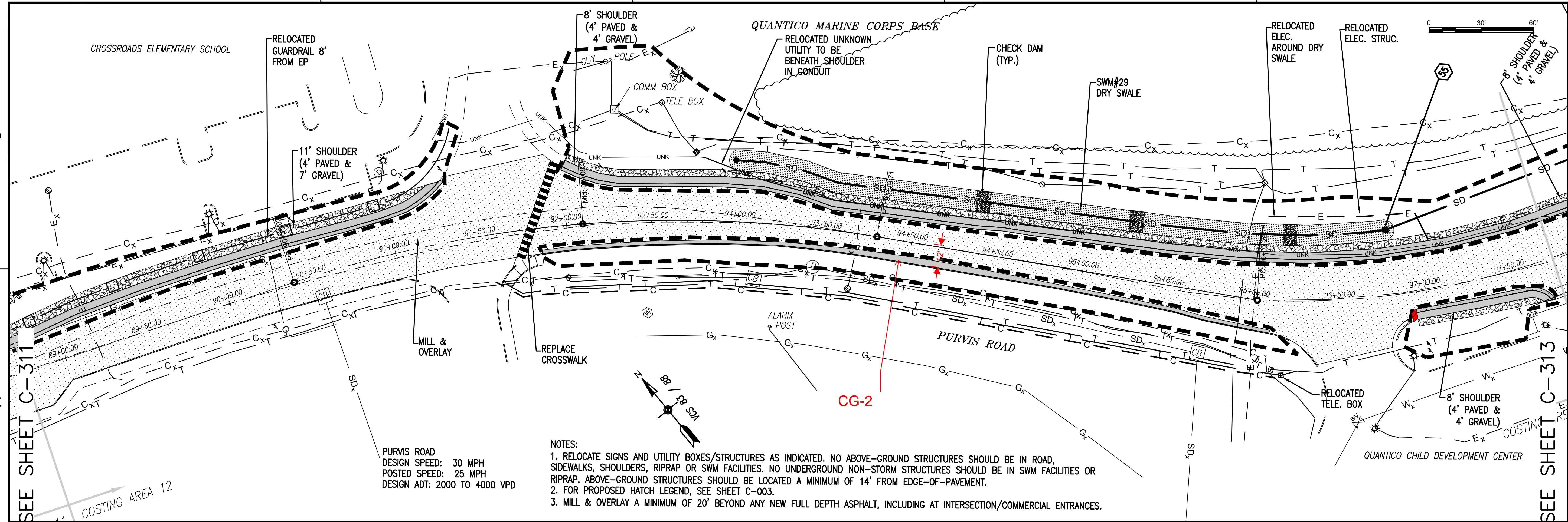
PURVIS ROAD
DESIGN SPEED: 30 MPH
POSTED SPEED: 25 MPH
DESIGN ADT: 2000 TO 4000 VPD

- NOTES:
1. RELOCATE SIGNS AND UTILITY BOXES/STRUCTURES AS INDICATED. NO ABOVE-GROUND STRUCTURES SHOULD BE IN ROAD, SIDEWALKS, SHOULDERS, RIPRAP OR SWM FACILITIES. NO UNDERGROUND NON-STORM STRUCTURES SHOULD BE IN SWM FACILITIES OR RIPRAP. ABOVE-GROUND STRUCTURES SHOULD BE LOCATED A MINIMUM OF 14' FROM EDGE-OF-PAVEMENT.
 2. FOR PROPOSED HATCH LEGEND, SEE SHEET C-003.
 3. MILL & OVERLAY A MINIMUM OF 20' BEYOND ANY NEW FULL DEPTH ASPHALT, INCLUDING AT INTERSECTION/COMMERCIAL ENTRANCES.

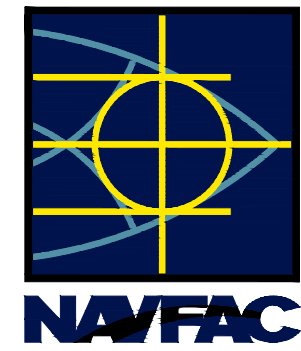


SEE SHEET C-209
MATCHLINE

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CHIEF ENG/ARCH					
FIRE PROTECTION					
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND - WASHINGTON NAVFAC WASHINGTON QUANTICO MARINE CORPS BASE QUANTICO, VA					
REPAIR PURVIS ROAD PLAN-8					
SCALE: 1"=30'					
PROJECT NO.: Q149100M					
CONSTR. CONTR. NO.: N40080-15-D-0154					
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C-308					
DRAWING REVISION: 31 JANUARY 2017					



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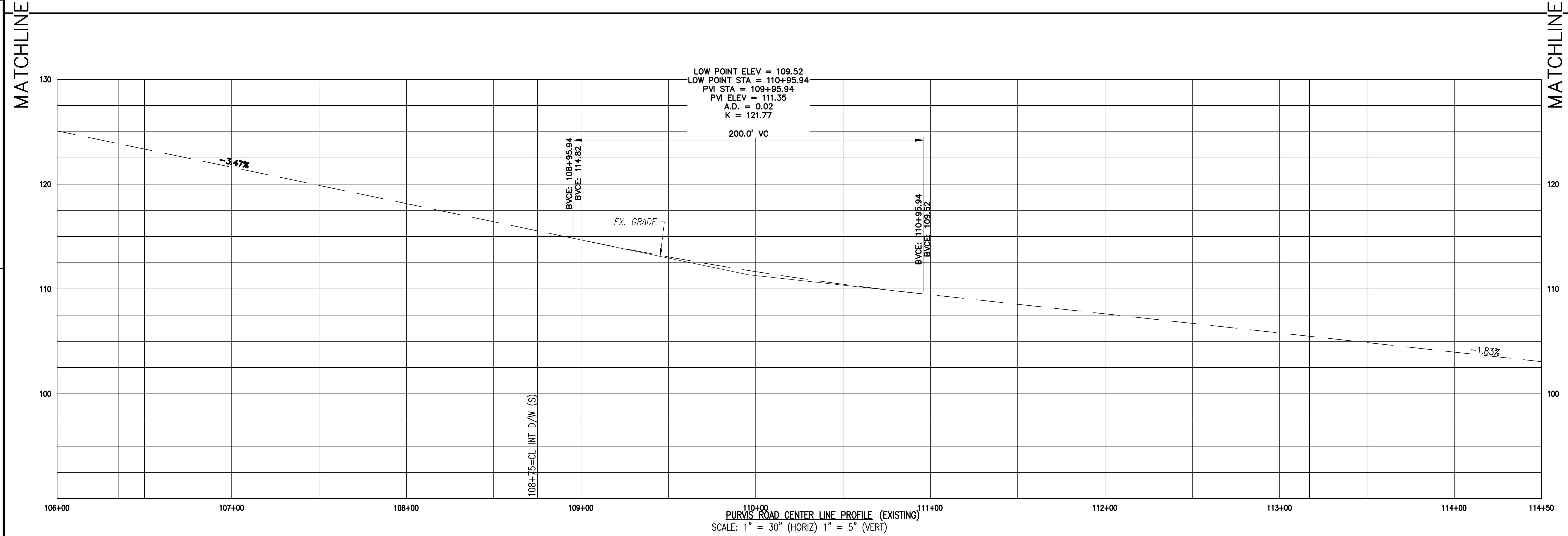


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BRANCH MANAGER			
CHIEF ENG/ARCH			
FIRE PROTECTION			

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND - WASHINGTON
NAVFAC WASHINGTON
NAVAL FACILITIES ENGINEERING COMMAND - WASHINGTON
MCR, QUANTICO, VA
QUANTICO MARINE CORPS BASE
QUANTICO, VA

SCALE:	1"=30'
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CONSTR. CONTR. NO.	N40080-15-D-0154
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Appendix C
Air Quality Methodology and Calculations

Record of Non-Applicability (RONA) for General Conformity

Project Name Purvis Rd Improvement Project Sections 1-15
Project Number 4.13148
Project Contact PWB/OPS

General Conformity under the Clean Air Act, Section 176(c) has been evaluated for the project described above according to the requirements of Title 40 Code of Federal Regulations (CFR) Part 93 and the applicable State Implementation Plan. The requirement of a conformity determination under this rule is not applicable to this project/action because:

☐

The project/action qualifies as an exempt action. The applicable exemption citation is:

Example: 40 CFR 93.153(c)(2)(xiv) Transfers of ownership, interests, and titles in land, facilities, and real and personal properties, regardless of the form or method of the transfer.

Note: Exemptions must be contained in the State Implementation Plan.

OR

☒

Total direct and indirect emissions from this project/action have been determined to be below the *de minimus* threshold for conformity purposes estimated at:

4.25 tons/year of NO_x

28.67 tons/year of VOC

0.31 tons/year of PM₁₀

411.32 tons/year of CO₂

 tons/year of

These levels are below the conformity threshold values established at 40 CFR 93.153(b), and supporting documentation and emission estimates are:

☐

Attached

☐

Appear in the NEPA Documentation

☒

Other Emissions calculations are kept by the Air Program Manager in electronic format.

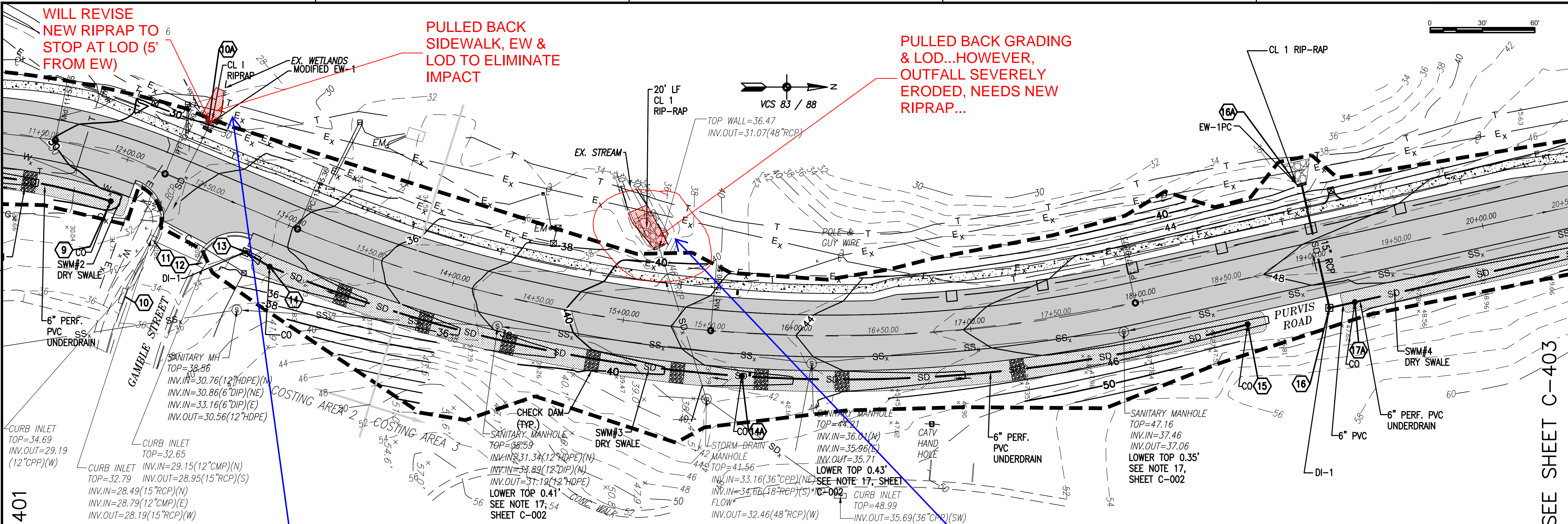
ENVIRONMENTAL COORDINATOR (title and signature)

DATE

Appendix D
Wetlands Information and
ACoE Correspondence

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MATCHLINE SEE SHEET C-401



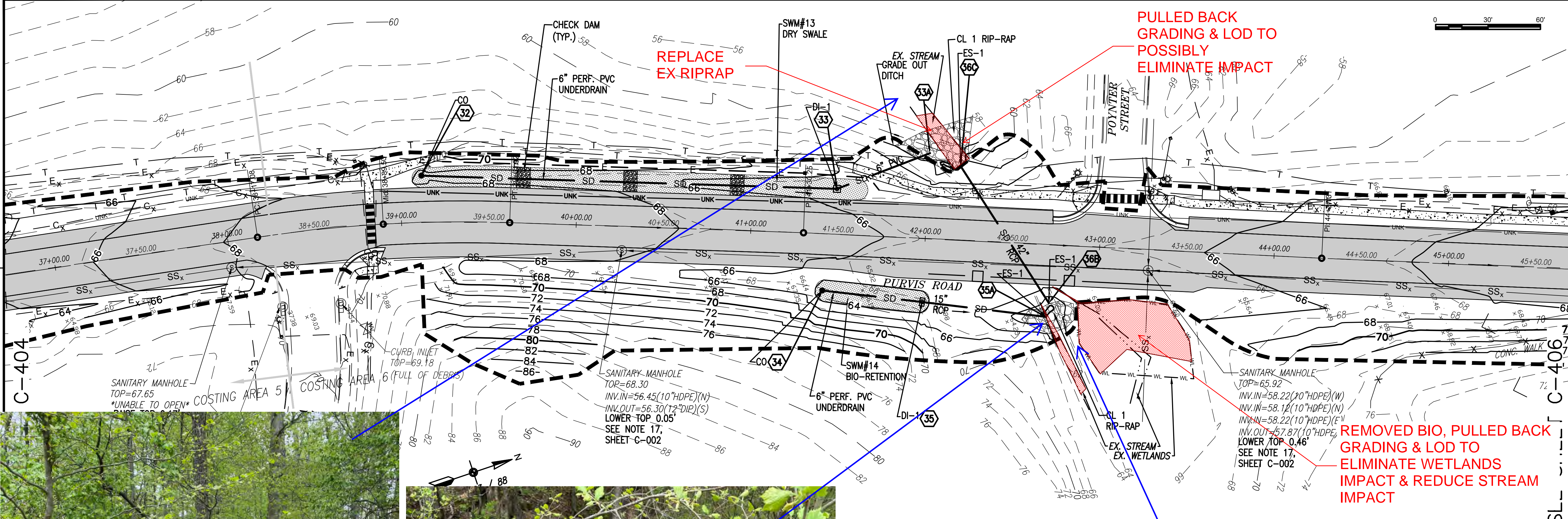
WETLANDS EXHIBIT
8 PAGES
05-13-2020




Notes:
1. Red hatched areas indicate impact areas to wetlands/streams based on previous design. Limits of disturbance (LOD) have now been reduced (as shown on this exhibit) to reduce/minimize impacts.



MATCHLINE SEE SHEET C-403

6/3/2020		DATE	APPR
FINAL SUBMISSION		DESCRIPTION	SW
APPROVED		A/E INFO	
FOR COMMANDER NAVFAC		ACTIVITY	
SATISFACTORY TO		DATE	
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BRANCH MANAGER			
CHIEF ENG/ARCH			
FIRE PROTECTION			
DEPARTMENT OF THE NAVY		NAVAL FACILITIES ENGINEERING COMMAND	
NAVFAC WASHINGTON		QUANTICO, VA	
QUANTICO MARINE CORPS BASE		REPAIR PURVIS ROAD	
GRADING & DRAINAGE-2			
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CONSTR. CONTR. NO.		N40080-15-D-0154	
NAVFAC DRAWING NO.			
SHEET		OF	
C-402			
DRAWN/REVISED: 31 JANUARY 2017			

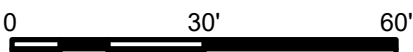
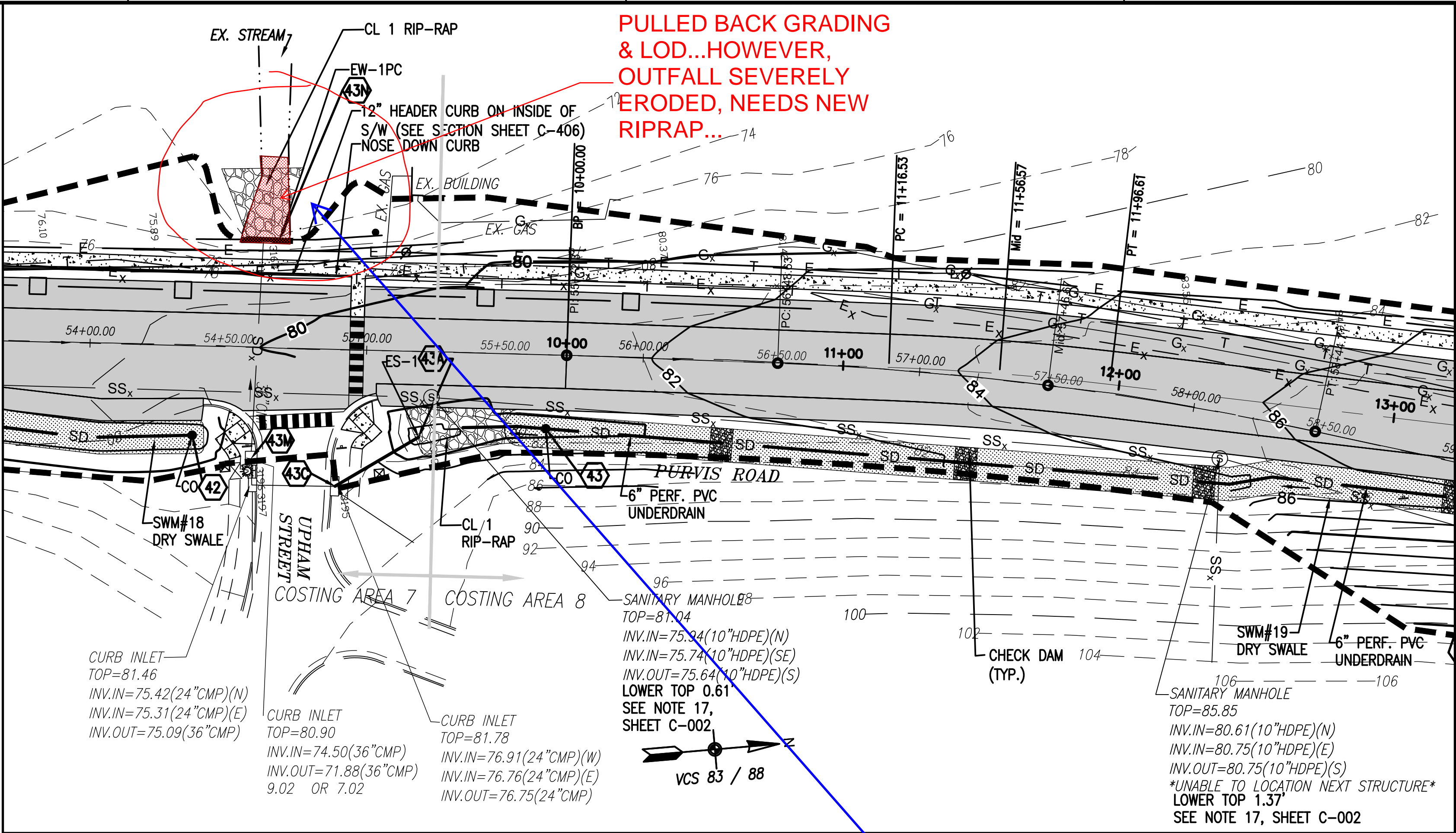


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BRANCH MANAGER			
CHIEF ENG/ARCH			
FIRE PROTECTION			
NAVAL FACILITIES ENGINEERING COMMAND			
NAVAL FACILITIES ENGINEERING COMMAND - WASHINGTON			
NAVAC WASHINGTON			
QUANTICO MARINE CORPS BASE			
QUANTICO, VA			
REPAIR PURVIS ROAD			
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SHEET OF			
C-405			
DRAWING REVISION: 31 JANUARY 2017			

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MATCHLINE SEE SHEET C-406



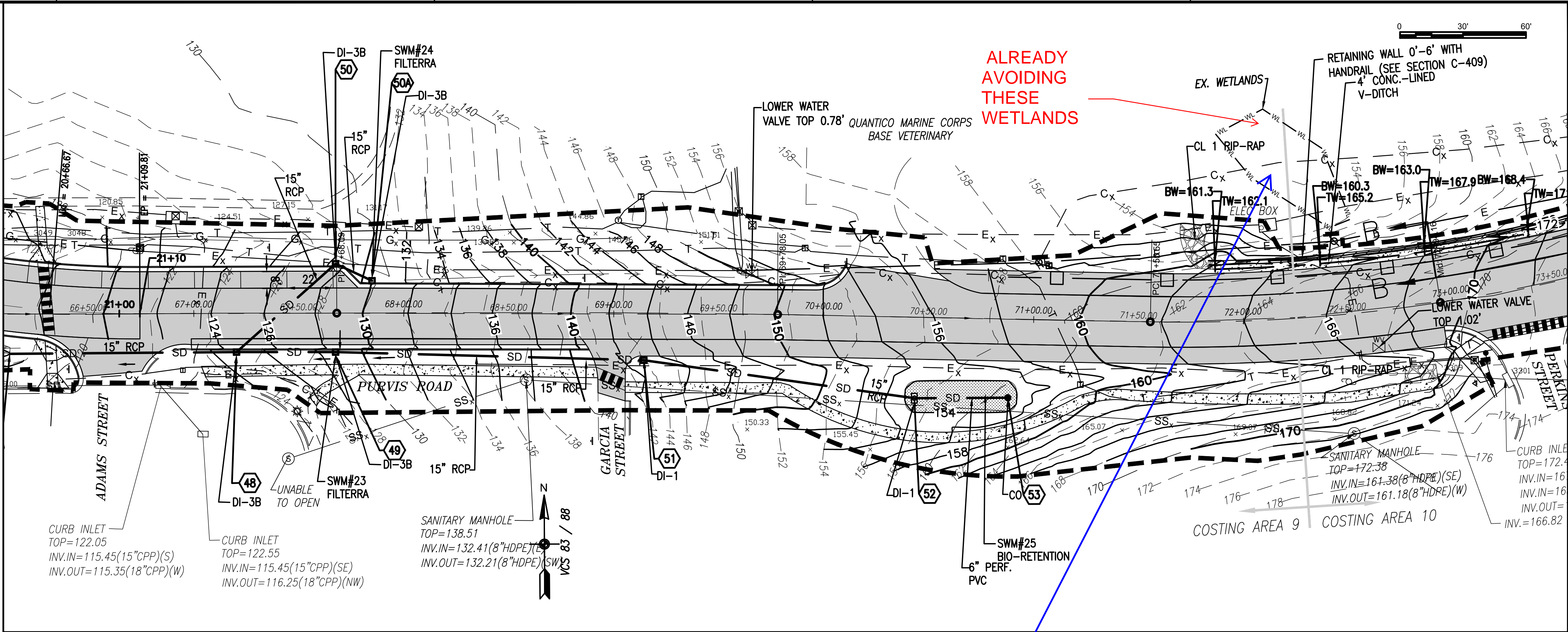
MATCHLINE SEE SHEET C-408

MATCHLINE SEE SHEET C-308A

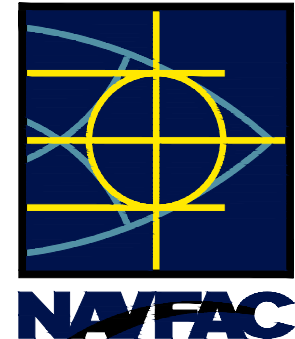


FINAL SUBMISSION	6/3/2020	DATE	APPR
 ADTEK CIVIL/STRUCTURAL/GEOTECHNICAL ENGINEERS 3990 Fairfax Boulevard, Suite 300 Fairfax, Virginia 22030 Phone: 703-691-4040 Fax: 703-691-4056 www.ADTEKengineers.com			
APPROVED			
FOR COMMANDER NAVFAC			
ACTIVITY			
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PM/DM			
BRANCH MANAGER			
CHIEF ENG/ARCH			
FIRE PROTECTION			
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND - WASHINGTON NAVFAC WASHINGTON QUANTICO MARINE CORPS BASE QUANTICO, VA			
REPAIR PURVIS ROAD GRADING & DRAINAGE-7			
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PROJECT NO.: QU149100M			
CONSTR. CONTR. NO. N40080-15-D-0154			
NAVFAC DRAWING NO.			
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DRAWING REVISION: 31 JANUARY 2017			

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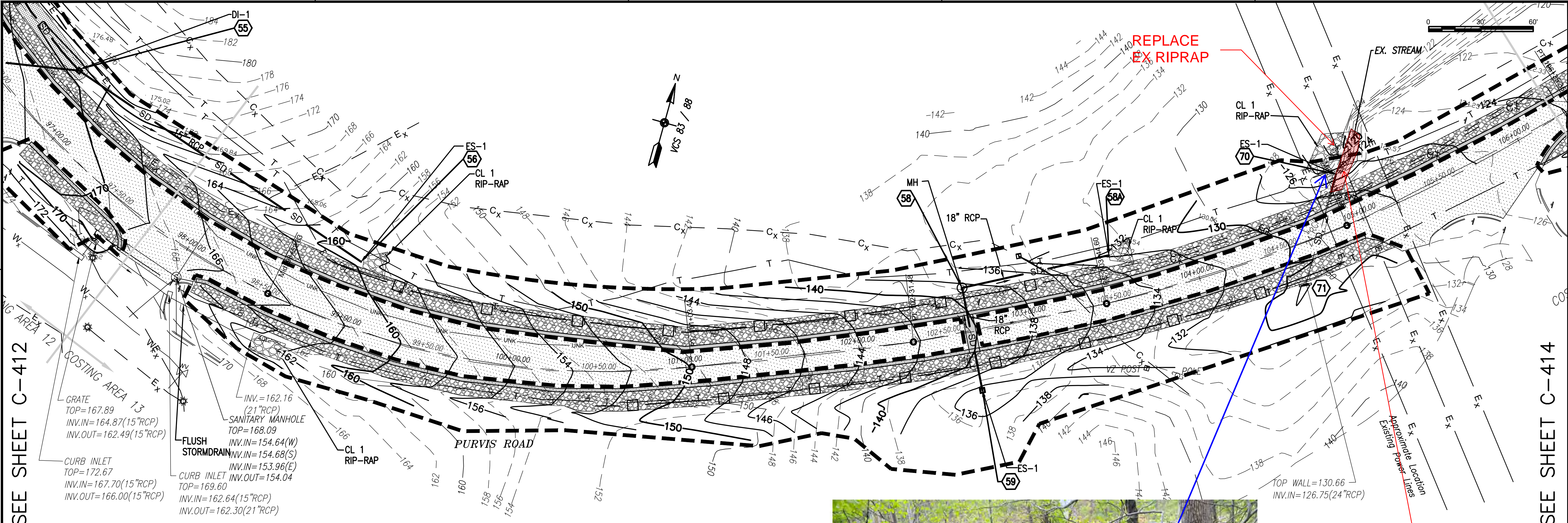
MATCHLINE SEE SHEET C-408



MATCHLINE SEE SHEET C-410

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BRANCH MANAGER			
CHIEF ENG/ARCH			
FIRE PROTECTION			
DEPARTMENT OF THE NAVY			
NAVAL FACILITIES ENGINEERING COMMAND - WASHINGTON			
NAVFAC WASHINGTON			
QUANTICO MARINE CORPS BASE			
QUANTICO, VA			
REPAIR PURVIS ROAD			
GRADING & DRAINAGE-9			
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DRAWING REVISION: 31 JANUARY 2017			

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PULLED BACK GRADING &
LOD TO REDUCE IMPACT,
BUT DUE TO ROAD
WIDENING, CANNOT
COMPLETELY ELIMINATE

MATCHLINE SEE SHEET C-412

MATCHLINE SEE SHEET C-414

FINAL SUBMISSION	6/3/2020	DATE	APPR
SYN	DESCRIPTION	DATE	APPR
 ADTEK CIVIL/STRUCTURAL/GEOTECHNICAL ENGINEERS 3990 Fairfax Boulevard, Suite 300 Fairfax, Virginia 22030 Phone: 703-691-4040 Fax: 703-691-4056 www.ADTEKengineers.com			
A/E INFO			
APPROVED			
FOR COMMANDER NAVFAC			
ACTIVITY			
SATISFACTORY TO DATE			
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BRANCH MANAGER			
CHIEF ENG/ARCH			
FIRE PROTECTION			
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND NAVFAC WASHINGTON QUANTICO MARINE CORPS BASE QUANTICO, VA			
REPAIR PURVIS ROAD GRADING & DRAINAGE-13			
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CONSTR. CONTR. NO. N40080-15-D-0154			
NAVFAC DRAWING NO.			
SHEET OF			
C-413			
DRAWING REVISION: 31 JANUARY 2017			



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

January 19, 2021

Northern Virginia Regulatory Section
NAO-2020-02357 (Purvis Road – QMCB)

Quantico Marine Corps Base
c/o Norton Land Design
Attn: Mr. Michael Norton
5146 Dorsey Hall, 2nd Floor
Ellicott City, Maryland 21042

Dear Mr. Norton:

This is in reference to your Department of the Army permit application number NAO-2020-02357 to install and replace riprap, headwalls and storm pipes associated with the maintenance and redesign of the existing Purvis Road. Approximately 0.05-acre of waters of the United States will be permanently and temporarily impacted by the proposed work. All work will be performed along Purvis Road within the Quantico Marine Corps Base in Quantico, Virginia in Prince William County. These impacts are detailed on the enclosed drawings entitled "Repair Purvis Road" and dated December 2020 (attached).

Your proposed work as outlined above satisfies the criteria contained in the Corps Nationwide Permit (3) and (18), attached. The Corps Nationwide Permits were published in the January 6, 2017 Federal Register notice (82 FR 1860) and the regulations governing their use can be found in 33 CFR 330 published in Volume 56, Number 226 of the Federal Register dated November 22, 1991.

Provided the Nationwide Permit General Conditions (enclosed) are met, an individual Department of the Army Permit will not be required. In addition, the Virginia Department of Environmental Quality has provided a **conditional** §401 Water Quality Certification for Nationwide Permit Numbers 3 and 18. A permit may be required from the Virginia Marine Resources Commission and/or your local wetlands board, and this verification is not valid until you obtain their approval, if necessary. This authorization does not relieve your responsibility to comply with local requirements pursuant to the Chesapeake Bay Preservation Act (CBPA), nor does it supersede local government authority and responsibilities pursuant to the Act. You should contact your local government before you begin work to find out how the CBPA applies to your project.

Enclosed is a *Certificate of Compliance* form which must be signed and returned within 30 days of completion of the project, including any required mitigation. Your signature on this form certifies that you have completed the work in accordance with the

Nationwide Permit terms and conditions, as well as any project specific conditions that have been included in this permit.

This verification is valid until the NWP is modified, reissued, or revoked. All of the existing NWPs are scheduled to be modified, reissued, or revoked prior to March 18, 2022. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant nationwide permit is modified or revoked, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this nationwide permit unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization in accordance with 33 CFR 330.4(e) and 33 CFR 330.5 (c) or (d). Project specific conditions listed in this letter continue to remain in effect after the NWP verification expires, unless the district engineer removes those conditions. Activities completed under the authorization of an NWP which was in effect at the time the activity was completed continue to be authorized by that NWP.

In granting an authorization pursuant to this permit, the Norfolk District has relied on the information and data provided by the permittee. If, subsequent to notification by the Corps that a project qualifies for this permit, such information and data prove to be materially false or materially incomplete, the authorization may be suspended or revoked, in whole or in part, and/or the Government may institute appropriate legal proceedings.

If you have any questions and/or concerns about this permit authorization, please contact Ms. Theresita Crockett-Augustine via telephone at (757) 201-7194 or via email at theresita.m.crockett-augustine@usace.army.mil.

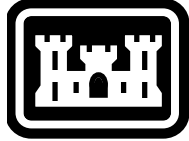
Sincerely,

Theresita Crockett-Augustine

Theresita Crockett-Augustine
Environmental Scientist
Northern Virginia Regulatory Section

Enclosures:

Drawings
Nationwide Permit
Certificate of Compliance



U.S. Army Corps
Of Engineers
Norfolk District

**CERTIFICATE OF COMPLIANCE
WITH
ARMY CORPS OF ENGINEERS PERMIT**

Permit Number: NAO-2020-02357 (Purvis Road – QMCB)

VMRC Number:

Corps Contact: Theresita Crockett-Augustine

Name of Permittee: Quantico Marine Corps Base

Date of Verification: January 19, 2021

Permit Type: NWP #s 3 and 18

Within 30 days of completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

US Army Corps of Engineers - Norfolk District
Northern Virginia Field Office
Attn: Ms. Theresita Crockett-Augustine
18139 Triangle Plaza, Suite 213
Dumfries, Virginia 22026

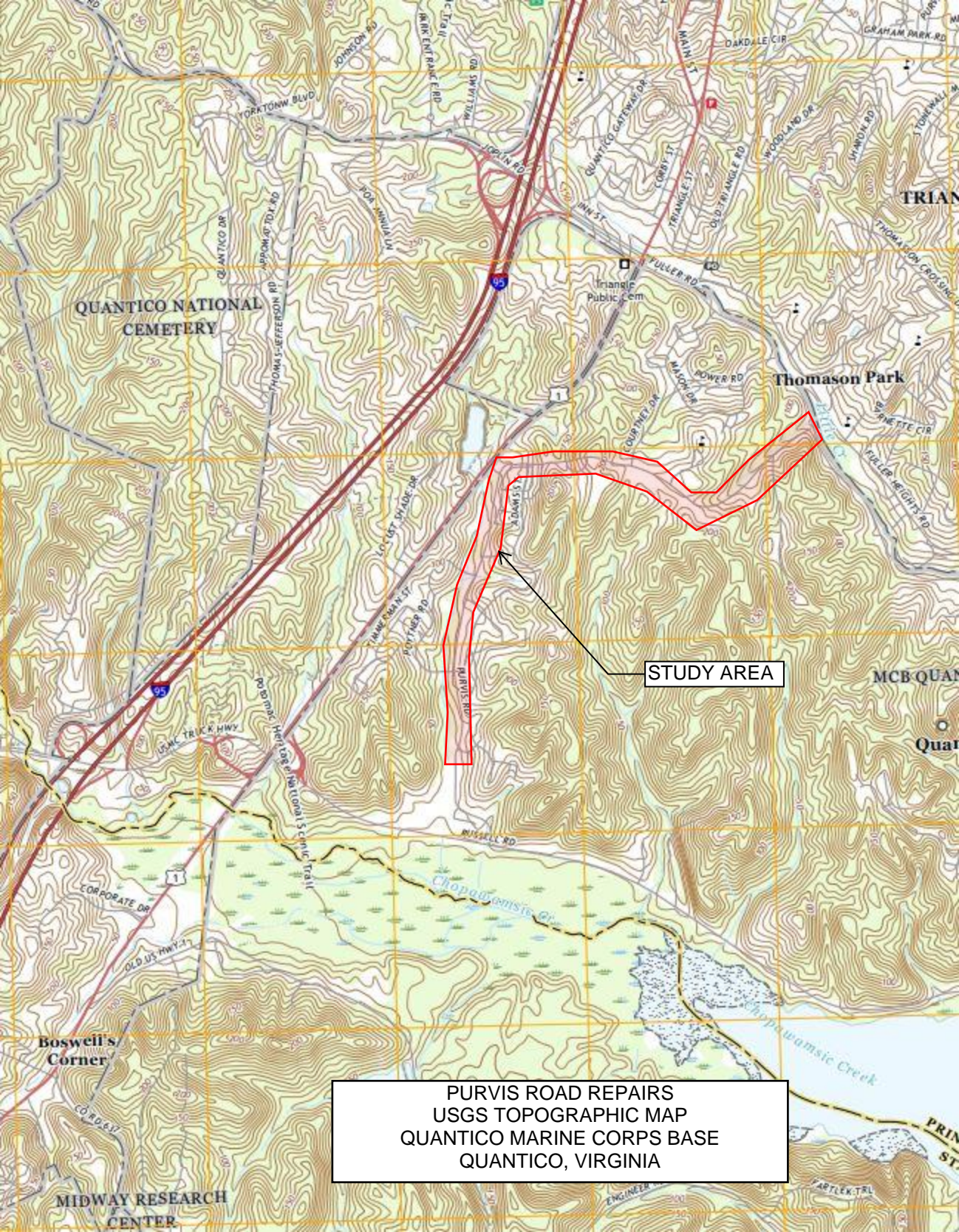
Or scan and send via email to theresita.m.crockett-augustine@usace.army.mil

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification or revocation.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation has been completed in accordance with the permit conditions.

Signature of Permittee

Date



QUANTICO NATIONAL CEMETERY

Thomason Park







STUDY AREA

PURVIS ROAD REPAIRS
USGS TOPOGRAPHIC MAP
QUANTICO MARINE CORPS BASE
QUANTICO, VIRGINIA

PURVIS ROAD

PURVIS ROAD REPAIRS,
QUANTICO MARINE CORPS BASE
QUANTICO, VA

Legend

-  Church
-  Medal of Honor Golf Course
-  National Museum of the Marine Corps
-  Purvis Rd
-  Quantico National Cemetery
-  Triangle

Purvis Rd

STUDY AREA

Google Earth

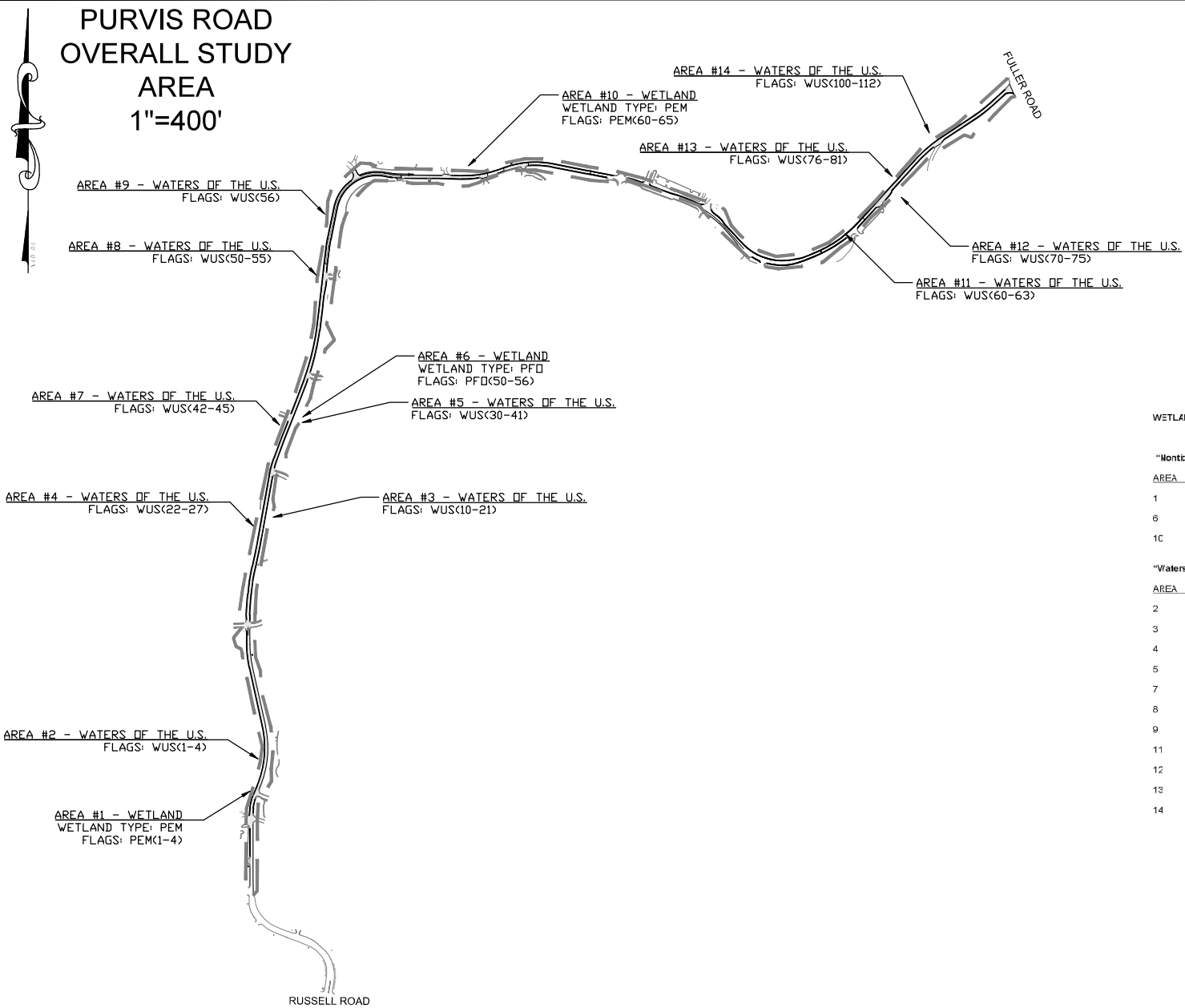
© 2020 Google

5000 ft



PURVIS ROAD OVERALL STUDY AREA

1"=400'



WETLANDS & WATERS OF U.S. SUMMARY

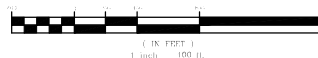
"Nontidal Wetlands"

AREA	WETLAND TYPE	FLAGS	COMMENTS
1	PEM	PEM(1-4)	
6	PFO	P-C(50-56)	
10	PEM	PEM(60-65)	

"Waters of the U.S."

AREA	FLAGS	COMMENTS
2	WUS(1-4)	
3	WUS(10-21)	
4	WUS(22-27)	
5	WUS(30-41)	Stream splits into two as shown by WUS 31 & 38
7	WUS(42-45)	
8	WUS(50-55)	
9	WUS(56)	Stream starts roughly 25' 30' from existing outfall.
11	WUS(60-63)	
12	WUS(70-75)	
13	WUS(76-81)	
14	WUS(100-112)	

GRAPHIC SCALE



NORTON LAND DESIGN
LANDSCAPE ARCHITECTURE + ENVIRONMENTAL PLANNING
5148 DORSEY HALL DRIVE, 2ND FLOOR
ELLICOTT CITY, MD 21042
P. 443.542.9119
WWW.NORTONLANDDESIGN.COM

SCALE	DATE	PROJ. NO.	SHEET NO.
AS SHOWN	DECEMBER 2020	17-178	L-3.1

6/7/19

FINAL SUBMISSION

NAFAC

ADTEK

14400-15-D-0154

QUANTICO MARINE CORPS BASE

REPAIR PURVIS ROAD

WATERS OF THE U.S. & WETLAND DELINEATION

SHEET 1 OF 2

L-3.1



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

January 19, 2021

PRELIMINARY JURISDICTIONAL DETERMINATION

Northern Virginia Regulatory Section
NAO-2020-02357 (Purvis Road - QMCB)

Quantico Marine Corps Base
c/o Norton Land Design
Attn: Mr. Michael Norton
5146 Dorsey Hall, 2nd Floor
Ellicott City, Maryland 21042

Dear Mr. Norton:

This letter is in reference to your request for a verification of a preliminary jurisdictional determination for waters of the U.S. (including wetlands) on property known as Purvis Road located on an approximately 23-acre parcel within the Quantico Marine Corps Base in Quantico, Virginia in Prince William County.

The map entitled "Repair Purvis Road", by Norton Land Design dated December 2020 (*copy enclosed*) provides the location of waters on the property listed above. The basis for this delineation includes application of the Corps' 1987 Wetland Delineation Manual and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, and the positive indicators of wetland hydrology, hydric soils, and hydrophytic vegetation and the presence of an ordinary high water mark. **This letter is not confirming the Cowardin classifications of these aquatic resources.**

Discharges of dredged or fill material, including those associated with mechanized landclearing, into waters on this site may require a Department of the Army permit and authorization by state and local authorities including a Virginia Water Protection Permit from the Virginia Department of Environmental Quality (DEQ), a permit from the Virginia Marine Resources Commission (VMRC) and/or a permit from your local wetlands board. This letter is a confirmation of the Corps preliminary jurisdiction for the waters on the subject property and does not authorize any work in these areas. Please obtain all required permits before starting work in the delineated waters/wetland areas.

This is a preliminary jurisdictional determination and is therefore not a legally binding determination regarding whether Corps jurisdiction applies to the waters in question. Accordingly, you may either consent to jurisdiction as set out in this preliminary jurisdictional determination and the attachments hereto if you agree with the determination, or you may request and obtain an approved jurisdictional determination.

“This preliminary jurisdictional determination and associated wetland delineation map may be submitted with a permit application.”

Enclosed is a copy of the “Preliminary Jurisdictional Determination Form”. Please review the document, sign, and return one copy to Ms. Theresita Crockett-Augustine either via email (theresita.m.crockett-augustine@usace.army.mil) or via standard mail to US Army Corps of Engineers, Fredericksburg Field Office, 1329 Alum Spring Road, Suite 102, Fredericksburg, Virginia 22401 within 30 days of receipt and keep one for your records. This delineation of waters and/or wetlands is valid for a period of five years from the date of this letter unless new information warrants revision prior to the expiration date.

If you have any questions, please contact Ms. Theresita Crockett-Augustine at (757) 201-7194 or theresita.m.crockett-augustine@usace.army.mil.

Sincerely,

Theresita Crockett-Augustine

Theresita Crockett-Augustine
Environmental Scientist
Northern Virginia Regulatory Section

Enclosures:

Delineation Map
Preliminary Jurisdictional Determination Form
Supplemental Preapplication Information

BACKGROUND INFORMATION**A. REPORT COMPLETION DATE FOR PJD:** 19-JAN-2021**B. NAME AND ADDRESS OF PERSON REQUESTING PJD:**

Quantico Marine Corps Base
 3019 Embry Loop
 Quantico, VA 22134

C. DISTRICT OFFICE, FILE NAME, AND NUMBER:

NAO, Purvis Road - QMCB, NAO-2020-02357

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: VA County/parish/borough: Prince William County City:

Center coordinates of site (lat/long in degree decimal format):

Lat.: 38.530431° Long.: -77.337031°

Universal Transverse Mercator: 18

Name of nearest waterbody: Chopawamsic Creek

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date:

☒ Field Determination. Date(s):

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO
 REGULATORY JURISDICTION.

Site Number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
S	38.530431	-77.337031	1078 feet	Non-wetland waters	Section 404
W	38.530431	-77.337031	0.0652 acres	Wetland	Section 404

- 1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.
- 2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which

¹ Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there "may be" waters of the U.S. and/or that there "may be" navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for PJD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

- ☒ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
Map: _____.
- ☒ Data sheets prepared/submitted by or on behalf of the PJD requestor.
 - ☐ Office concurs with data sheets/delineation report.
 - ☐ Office does not concur with data sheets/delineation report. Rationale: _____.
- ☐ Data sheets prepared by the Corps: _____.
- ☐ Corps navigable waters' study: _____.
- ☐ U.S. Geological Survey Hydrologic Atlas: _____.
- ☐ USGS NHD data.
- ☐ USGS 8 and 12 digit HUC maps.
- ☒ U.S. Geological Survey map(s). Cite scale & quad name: _____.
- ☒ Natural Resources Conservation Service Soil Survey. Citation: _____.
- ☒ National wetlands inventory map(s). Cite name: _____.
- ☐ State/local wetland inventory map(s): _____.
- ☒ FEMA/FIRM maps: _____.
- ☐ 100-year Floodplain Elevation is: _____. (National Geodetic Vertical Datum of 1929)
 - ☒ Photographs: ☒ Aerial (Name & Date): _____.
 - ☐ or ☐ Other (Name & Date): _____.

¹ Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

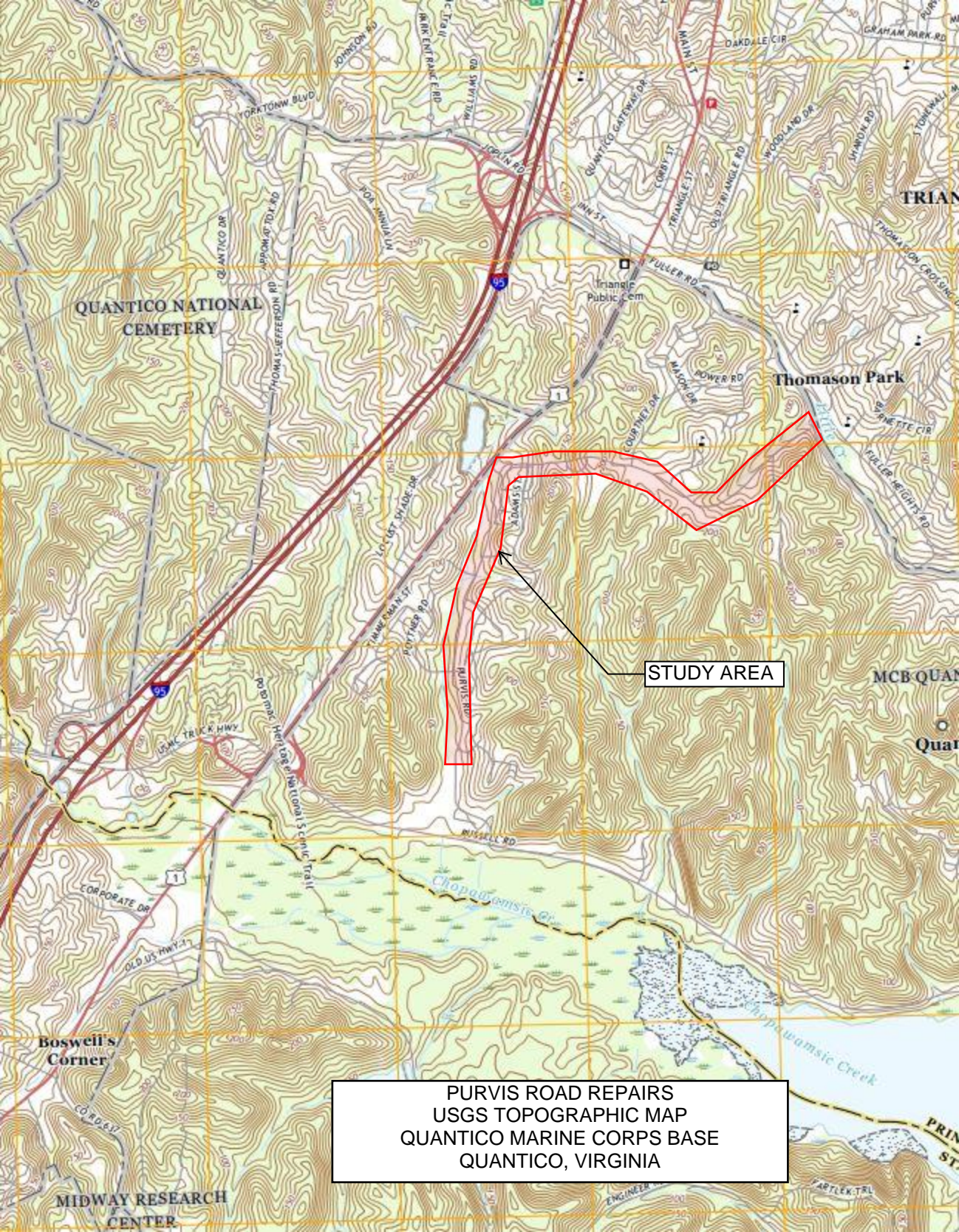
- ☐ Previous determination(s). File no. and date of response letter: _____.
- ☐ Other information (please specify): _____.

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and date of Regulatory staff
member completing PJD

Signature and date of person requesting
PJD (REQUIRED, unless obtaining the
signature is impracticable)¹

¹ Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.



QUANTICO NATIONAL
CEMETERY

Thomason Park







STUDY AREA

PURVIS ROAD REPAIRS
USGS TOPOGRAPHIC MAP
QUANTICO MARINE CORPS BASE
QUANTICO, VIRGINIA

PURVIS ROAD

PURVIS ROAD REPAIRS,
QUANTICO MARINE CORPS BASE
QUANTICO, VA

Legend

-  Church
-  Medal of Honor Golf Course
-  National Museum of the Marine Corps
-  Purvis Rd
-  Quantico National Cemetery
-  Triangle

Purvis Rd

STUDY AREA

Google Earth

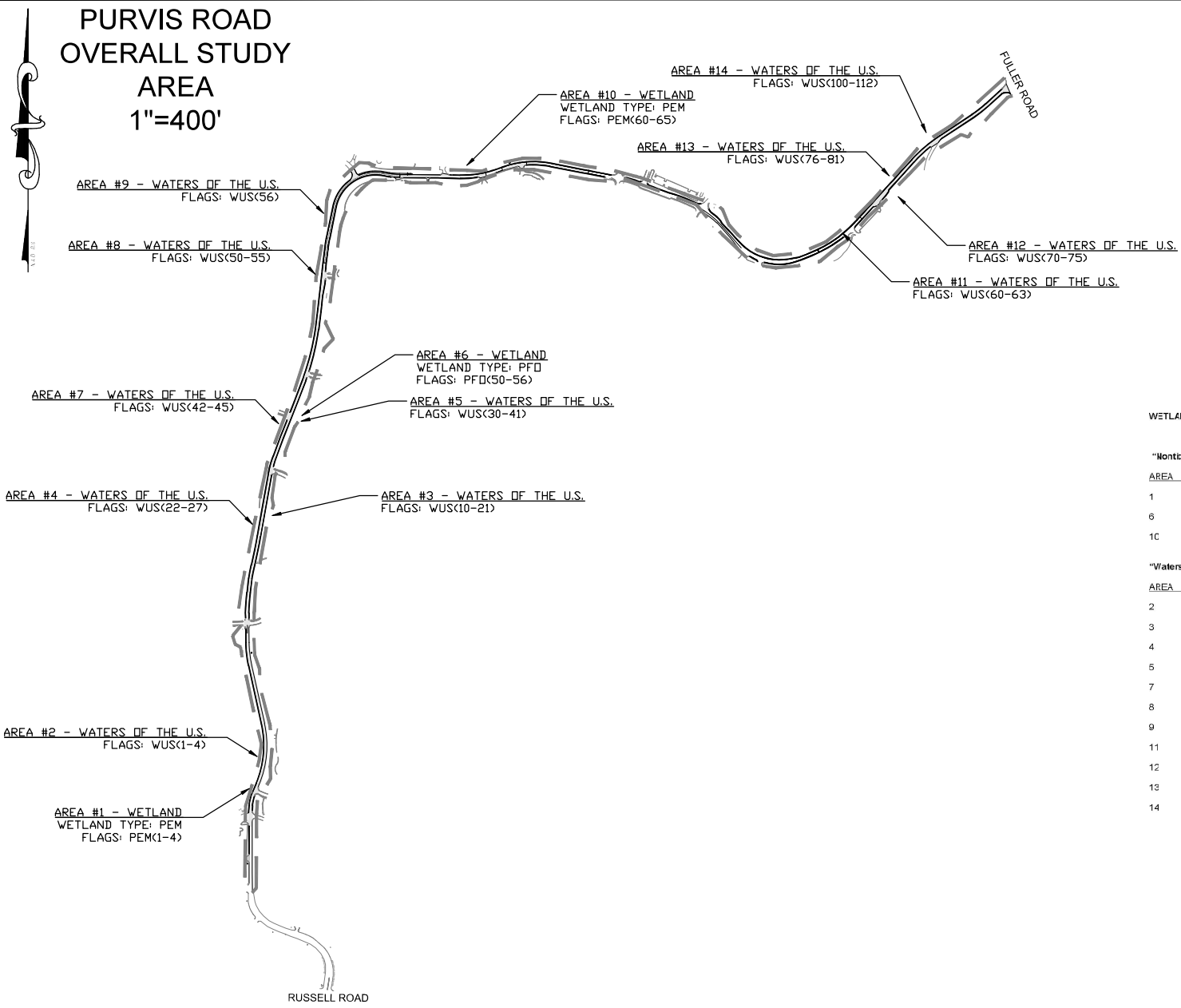
© 2020 Google

5000 ft



PURVIS ROAD OVERALL STUDY AREA

1"=400'



LEGEND

— OVERALL STUDY AREA

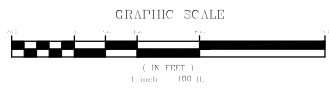
WETLANDS & WATERS OF U.S. SUMMARY

"Nontidal Wetlands"

AREA	WETLAND TYPE	FLAGS	COMMENTS
1	PEM	PEM(1-4)	
6	PFO	P-C(50-56)	
1C	PEM	PEM(60-65)	

"Waters of the U.S."

AREA	FLAGS	COMMENTS
2	WUS(1-4)	
3	WUS(1C-21)	
4	WUS(22-27)	
5	WUS(3C-41)	Stream splits into two as shown by WUS 31 & 38
7	WUS(42-45)	
8	WUS(5C-55)	
9	WUS(56)	Stream starts roughly 25' 30" from existing outfall.
11	WUS(6C-63)	
12	WUS(7C-75)	
13	WUS(76-81)	
14	WUS(10C-112)	



NORTON LAND DESIGN
LANDSCAPE ARCHITECTURE + ENVIRONMENTAL PLANNING
5148 DORSEY HALL DRIVE, 2ND FLOOR
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WWW.NORTONLANDDESIGN.COM

SCALE	DATE	PROJ. NO.	SHEET NO.
AS SHOWN	DECEMBER 2020	17-178	L-3.1

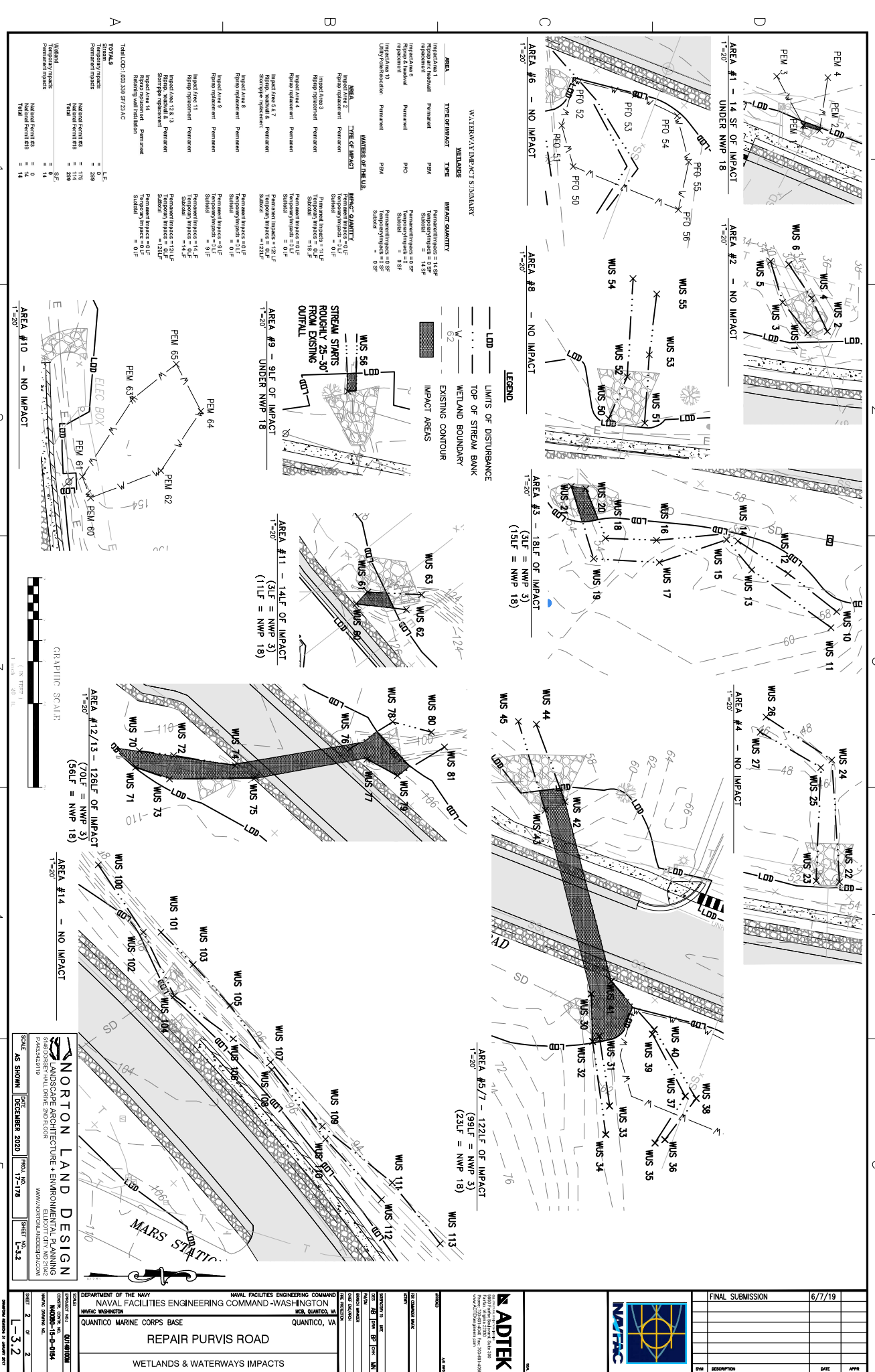
6/7/19

FINAL SUBMISSION

DEPARTMENT OF THE NAVY
FACILITIES ENGINEERING COMMAND - WATERS OF THE U.S. DIVISION
QUANTICO MARINE CORPS BASE
QUANTICO, VA

REPAIR PURVIS ROAD
WATERS OF THE U.S. & WETLAND DELINEATION

PROJECT NO.: Q140100M
CONTR. CONTR. NO.: 14C000-15-D-0154
NAFAC DRAWING NO.:
SHEET 1 OF 2
L-3.1





DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

January 19, 2021

Supplemental Preapplication Information

Project Number: NAO-2020-02357 (Purvis Road - QMCB)

1. A search of the Virginia Department of Historic Resources data revealed the following:

- ☒ No known historic properties are located on the property.
- ☐ Tribal consultation may be required.
- ☐ The following known architectural resources are located on the property:
- ☐ The following known archaeological resources are located on the property:
- ☐ The following known historic resources are located in the vicinity of the property (potential for effects to these resources from future development):

NOTE:

- 1) *The information above is for planning purposes only. In most cases, the property has not been surveyed for historic resources. Undiscovered historic resources may be located on the subject property or adjacent properties and this supplemental information is not intended to satisfy the Corps' requirements under Section 106 of the National Historic Preservation Act (NHPA).*
- 2) *Prospective permittees should be aware that Section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant.*

2. A search of the data supplied by the U.S. Fish & Wildlife Service, the Virginia Department of Conservation and Recreation and the Virginia Department of Game and Inland Fisheries revealed the following:

- ☐ No known populations of threatened or endangered species are located on or within the vicinity of the subject property.
- ☒ The following federally-listed species may occur within the vicinity of the subject property: Northern Long-eared Bat, *Myotis septentrionalis*
Indiana Bat, *Myotis sodalis*
- ☐ The following state-listed (or other) species may occur within the vicinity of the subject property:

Please note this information is being provided to you based on the preliminary data you submitted to the Corps relative to project boundaries and project plans. Consequently, these findings and recommendations are subject to change if the project scope changes or new information becomes available and the accuracy of the data.



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032
<http://www.fws.gov/northeast/virginiafield/>

In Reply Refer To:

January 06, 2021

Consultation Code: 05E2VA00-2021-SLI-1367

Event Code: 05E2VA00-2021-E-03939

Project Name: Purvis Road -QMCB

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at:

<http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>;

<http://www.towerkill.com>; and

[http://](http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html)

www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
 - USFWS National Wildlife Refuges and Fish Hatcheries
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office

6669 Short Lane

Gloucester, VA 23061-4410

(804) 693-6694

Project Summary

Consultation Code: 05E2VA00-2021-SLI-1367

Event Code: 05E2VA00-2021-E-03939

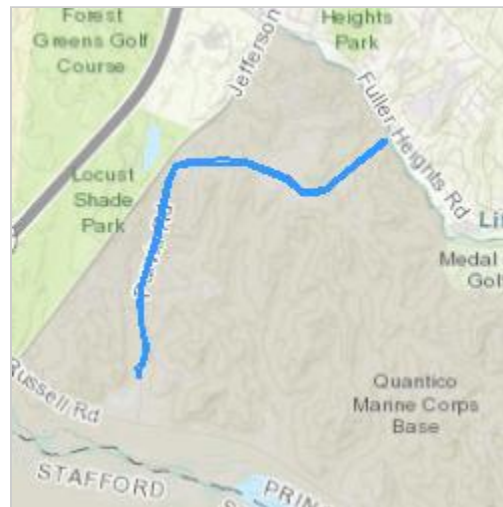
Project Name: Purvis Road -QMCB

Project Type: ** OTHER **

Project Description: Impacts to waters of the United States associated with the repairs and modification of an existing road and the adjacent sidewalks along Purvis Road located on Quantico Marine Corps Base in Quantico, VA in Prince William County.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@38.529993399999995,-77.34680828642345,14z>



Counties: Prince William County, Virginia

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

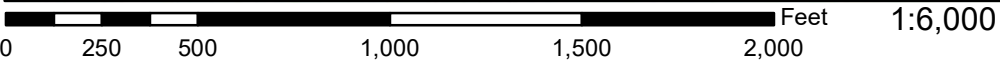
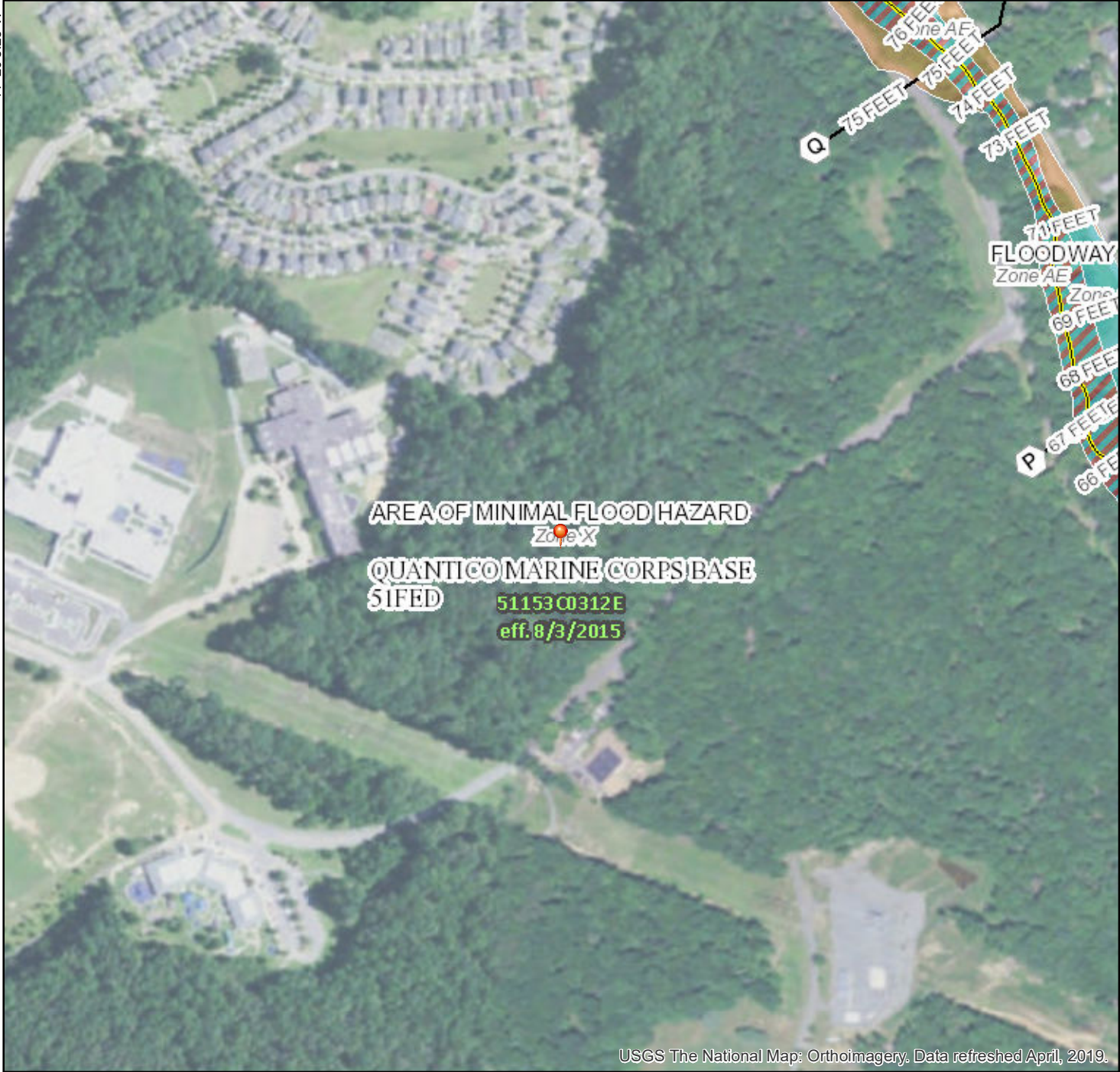
Appendix E

FEMA FIRMs

National Flood Hazard Layer FIRMette



38°32'25.92"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

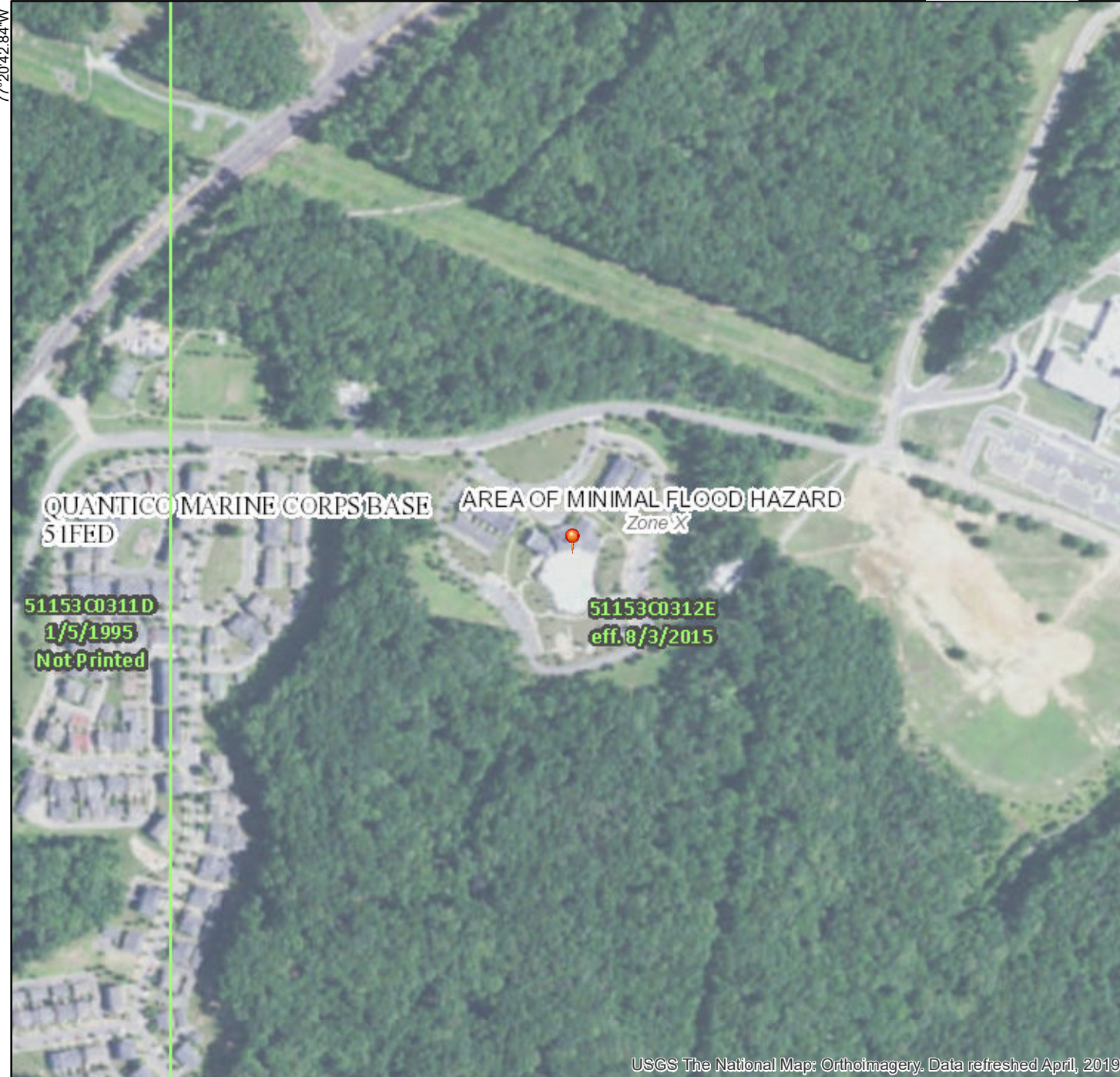
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This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette



38°32'22.52"N



USGS The National Map: Orthoimagery. Data refreshed April, 2019.

0 250 500 1,000 1,500 2,000 Feet 1:6,000

38°31'54.38"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		513 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **4/9/2020 at 1:38:54 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
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		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



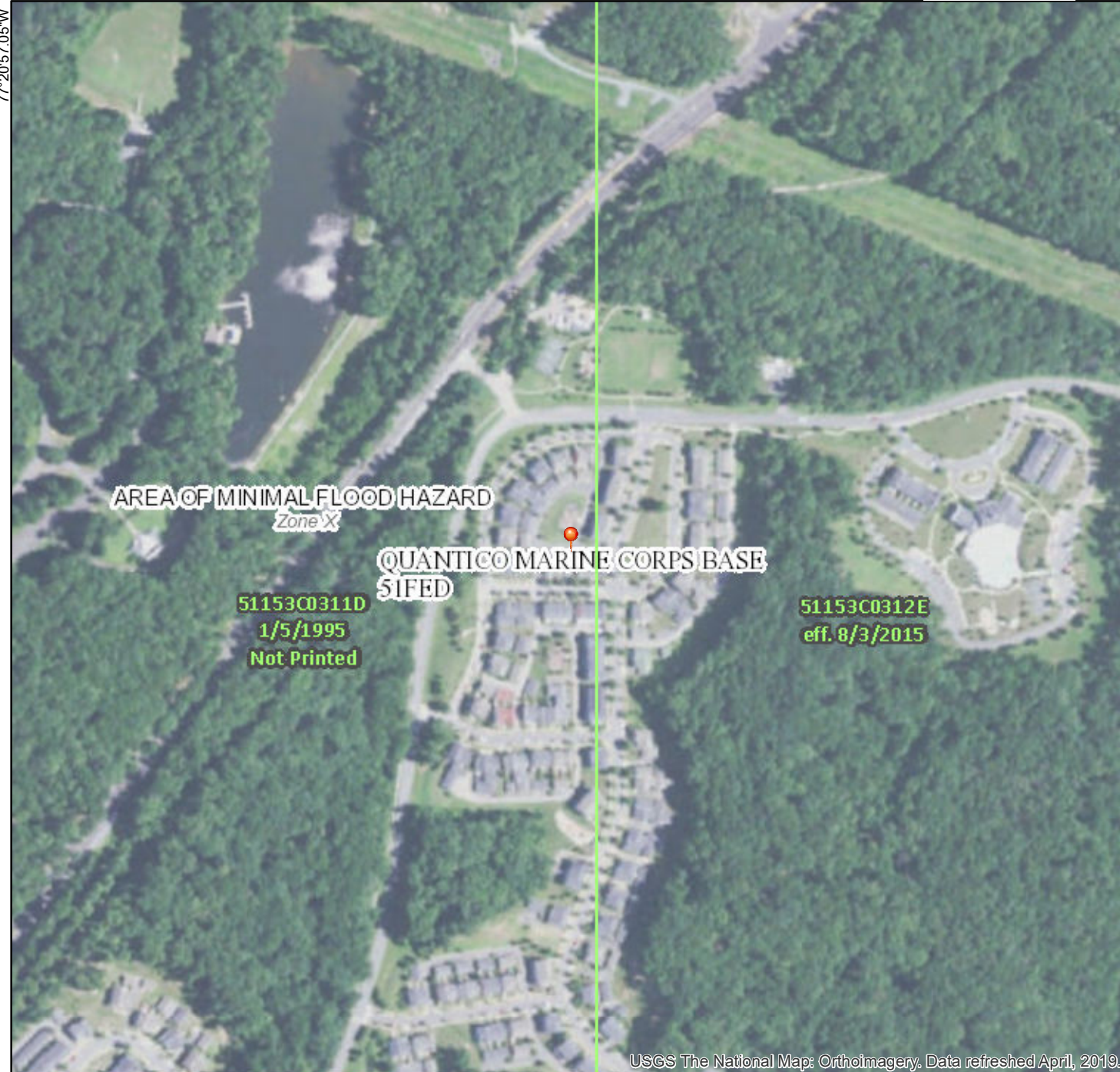
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This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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38°32'21.92"N



USGS The National Map: Orthoimagery. Data refreshed April, 2019.

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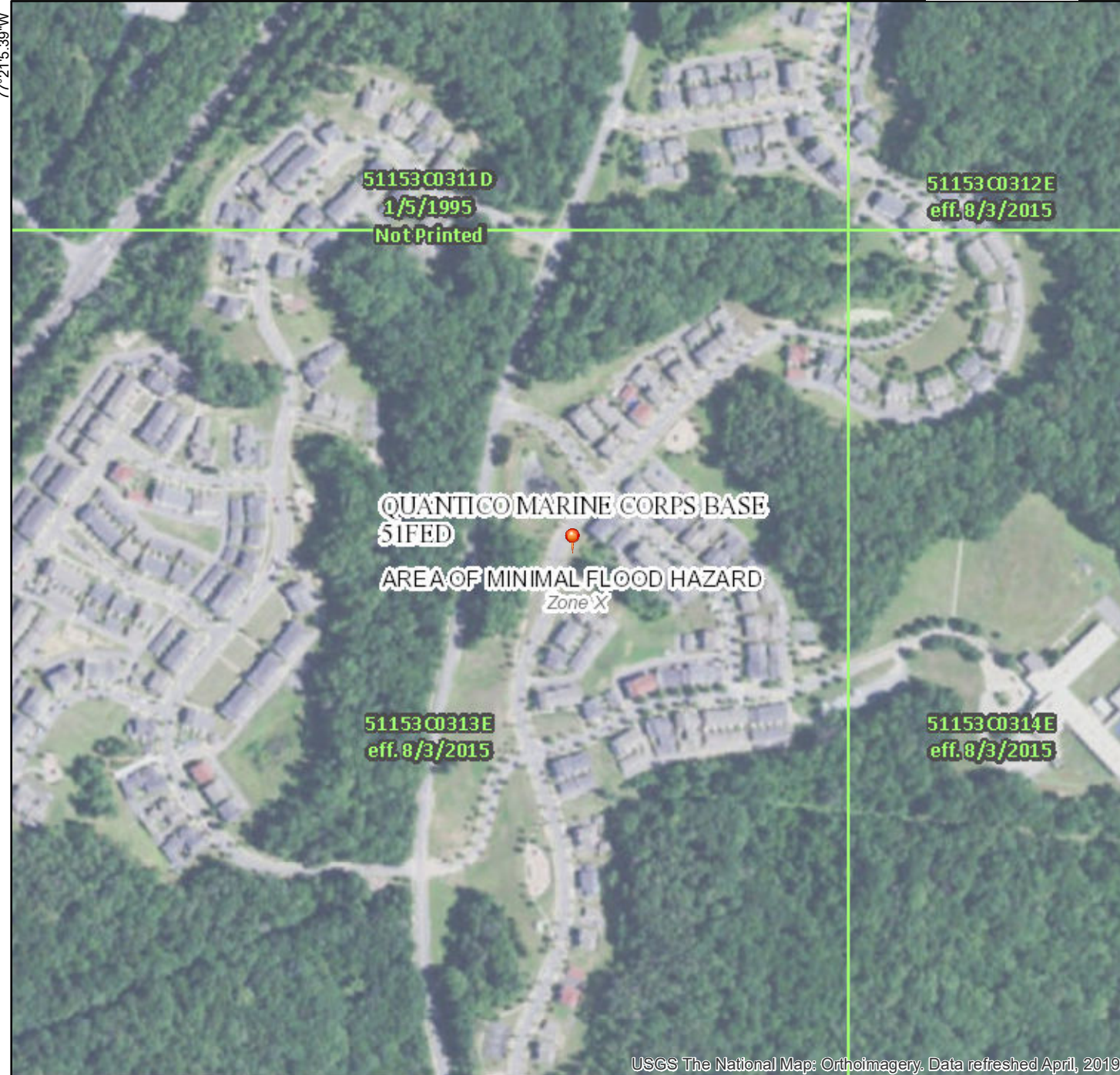
38°31'53.77"N

77°20'19.59"W

National Flood Hazard Layer FIRMette



38°31'58.48"N



USGS The National Map: Orthoimagery. Data refreshed April, 2019.

0 250 500 1,000 1,500 2,000 Feet 1:6,000

38°31'30.34"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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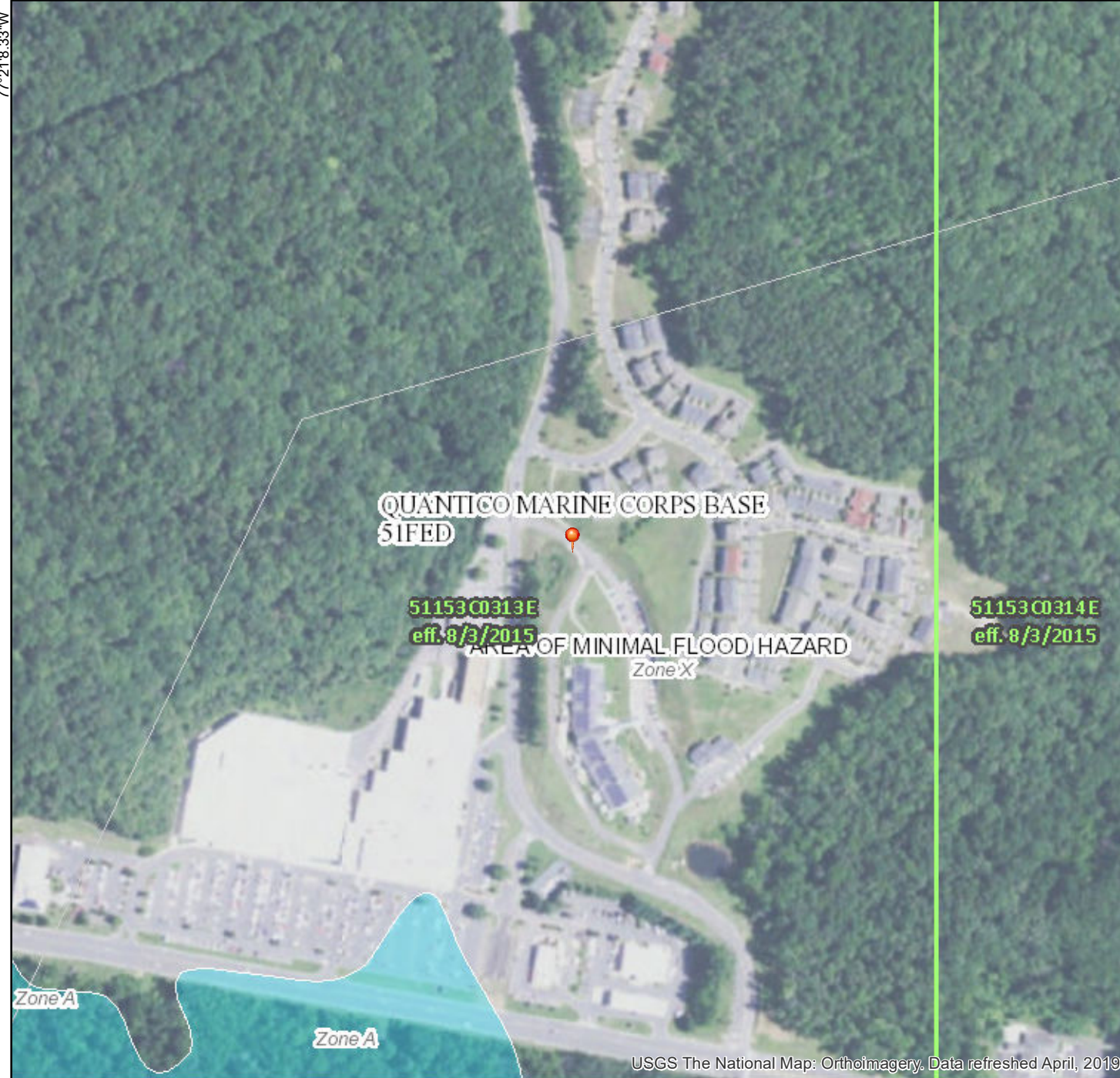
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



National Flood Hazard Layer FIRMette



38°31'34.18"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000

USGS The National Map: Orthoimagery, Data refreshed April, 2019.

38°31'6.03"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

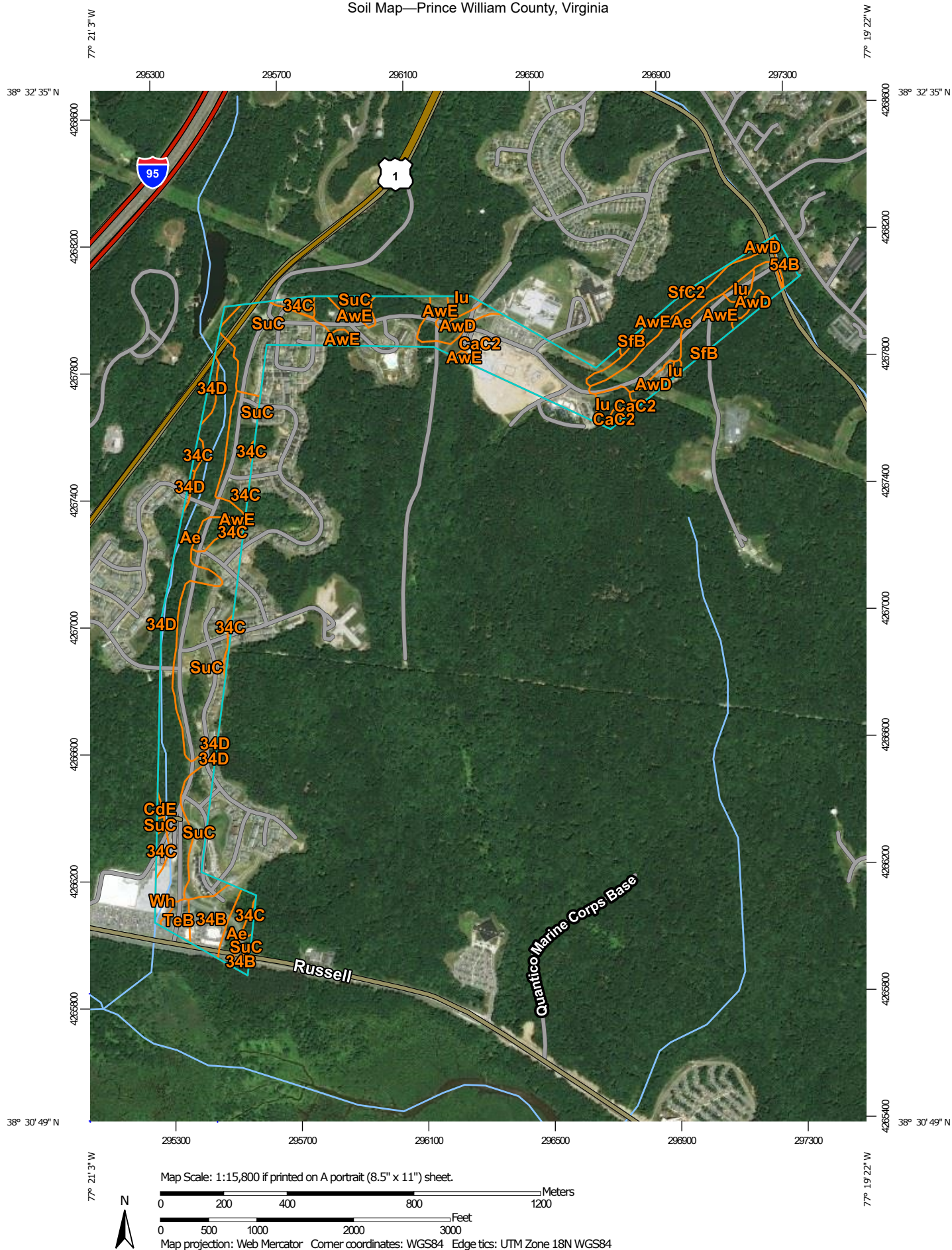
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This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix F
Soil Maps and Descriptions

Soil Map—Prince William County, Virginia



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

4/9/2020
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Prince William County, Virginia

Survey Area Data: Version 16, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 3, 2019—Aug 1, 2019

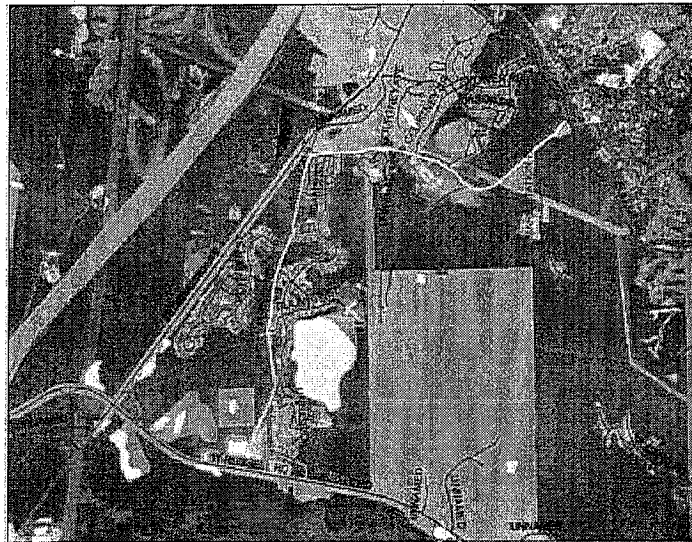
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
34B	Lunt loam, 2 to 7 percent slopes	6.3	3.6%
34C	Lunt loam, 7 to 15 percent slopes	6.5	3.7%
34D	Lunt loam, 15 to 25 percent slopes	9.1	5.1%
54B	Urban land-Udorthents complex, 0 to 7 percent slopes	1.4	0.8%
Ae	Alluvial land, wet	46.8	26.4%
AwD	Aura-Galestown-Sassafras complex, 6 to 15 percent slopes	5.8	3.3%
AwE	Aura-Galestown-Sassafras complex, 15 to 30 percent slopes	17.8	10.0%
CaC2	Caroline fine sandy loam, 6 to 10 percent slopes, eroded	30.4	17.2%
CdE	Caroline-Sassafras complex, 15 to 30 percent slopes	0.3	0.1%
Iu	Iuka fine sandy loam, local alluvium, 0 to 4 percent slopes	5.1	2.9%
SfB	Sassafras fine sandy loam, 2 to 6 percent slopes	0.5	0.3%
SfC2	Sassafras fine sandy loam, 6 to 10 percent slopes, eroded	0.1	0.0%
SuC	Susquehanna soils, 2 to 10 percent slopes	44.5	25.1%
TeB	Tetotum fine sandy loam, 2 to 6 percent slopes	1.9	1.1%
Wh	Wehadkee very fine sandy loam, 0 to 2 percent slopes	0.8	0.5%
Totals for Area of Interest		177.4	100.0%

Appendix G
National Historic Preservation Act Section 106 Documentation

**Archaeological Survey For
Purvis Road Expansion
Marine Corps Base Quantico, Stafford County,
Virginia**



**Kate Roberts
MCBQ Archaeologist
Natural Resources and Environmental Affairs Branch, Installation and
Environment Division, Marine
Corps Base,
Quantico, Virginia**

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Management Summary	3
1.0 Historic Context	
2.0 Previous Research	4
2.0.1 <i>Specific Historic Background</i>	
3.0 Survey Results	
3.0.1 <i>STP Results</i>	
References Cited	

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Figure 1. Map of Survey Area along Purvis Road.....	3
Figure 2. UXO21 in relation to 44PW1665	

Management Summary

The objective of the assessment is to identify improvements needed to the Purvis Road corridor, along a distance of about 2 miles to correct exhibited deficiencies of narrow pavement, poor drainage, erosion, pavement and subgrade damage and deterioration, and other deficiencies. It is the desire of the government to repair deficiencies and to improve road corridor appearance and safety. An archaeological survey was conducted along the road to relocate two sites that were potentially eligible for the National Register of Historic Places (NRHP) and to locate new sites within 50 meters of the existing road. Three sites located along the road were previously recorded, two are potentially eligible for NHRP (44PW1665, 44PW1106) and a third site that is not eligible (44PW1003).

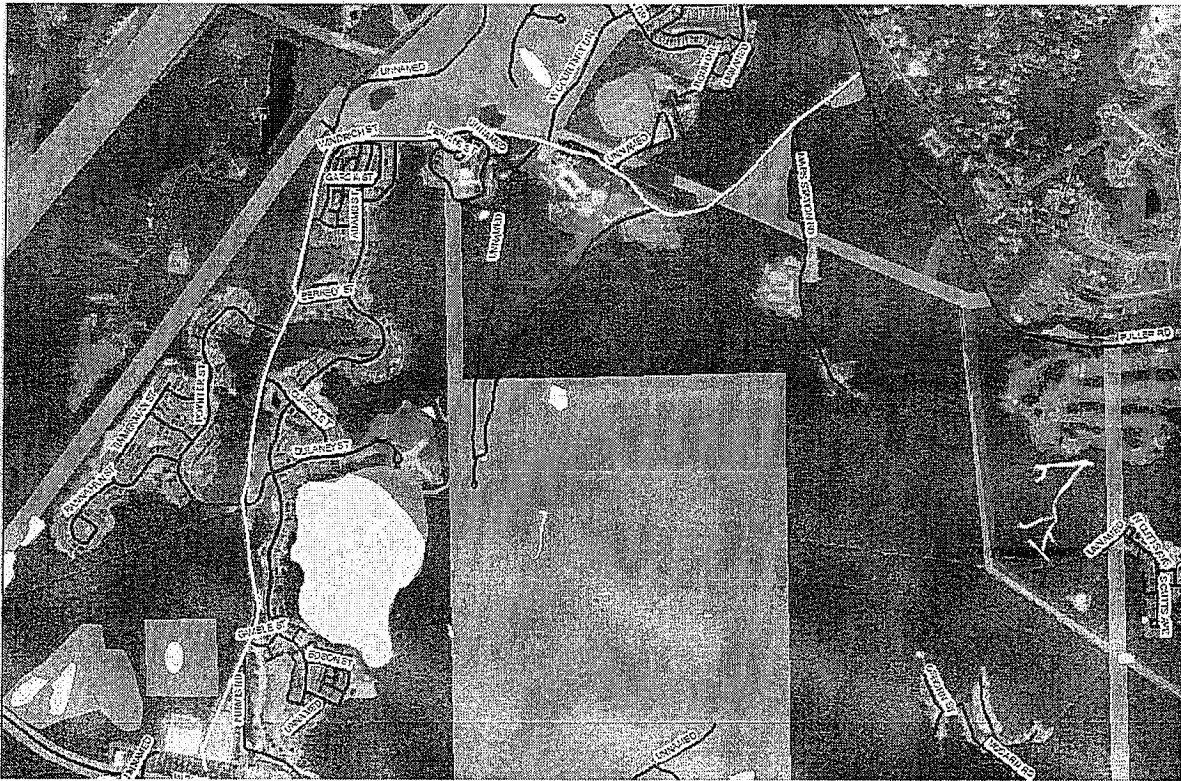


Figure 1. Map of Survey Area along Purvis Road

1.0 Historical Context

A general overview of the history and prehistory for the MCBQ installation area is given in the Integrated Cultural Resources Management Plan (NREA 2015) and in the scores of cultural resource survey reports. Given the scope of this study this will not be reiterate in this report.

2.0 Previous Research

Report Number	Year	Title	Author
47	2001	Phase I Survey of 16 Areas and Phase II Evaluation of 44ST205, 44ST327, 44ST399, and 44PW634, Marine Corps Base, Quantico Stafford and Prince William Counties, Virginia	Cynthia W. Auman
25	1996	Phase I Cultural Resources Investigation of the Stable Road Youth Center Alternate Aboard the Marine Corps Base Quantico, Fauquier, Prince William and Stafford Counties, Virginia	Eric Voigt
34	1997	The Cultural Legacy of Quantico, Volume 4: Part 3 Developing and Testing a Predictive Model for Identifying Significant Archaeological Resources, Marine Corps Base Quantico, Fauquier, Prince William, and Stafford Counties, Virginia	Joe B. Jones
37	1998	Phase I Archaeological Survey, Marine Corps Heritage Center, Marine Corps Base Quantico, Stafford County, Virginia	J. Sanderson Stephens

Site Number	Description	NRHP Status
44PW1002	Unidentified prehistoric	Not eligible
44PW1665	Historic - 20th c./Prehistoric Unidentified (possible Civil War component - earthworks used Later by USMC)	Further Study needed
44PW1106	Prehistoric-Middle, Late Archaic(Halifax, Lobate, Savannah R. small)/Historic - Late 18th/Early 19th c.	Eligible
44PW1003	Unidentified prehistoric	Not eligible

2.0.1 Specific Historic Background

In 1917 the Department of Defense leased land near Quantico that was used to train Officer and Enlisted Marine in trench warfare before deploying to Europe. Initially, the Department of the Navy leased 5,300 acres of land from the Quantico Company. The area had room for 7,000 Marines, trench training, and ranges (Fleming et al. 1978). All of the buildings initially constructed at Quantico were wooden structures. The first permanently constructed buildings were Officer housing built in 1918. Permanent constructions continued until the 1930's when the Department of the Navy purchased additional land on Shipping Point (Hospital Point) to construct a Naval Hospital Facility to support World War II.

World War I changed the way combatants engaged on the battlefield. With the introduction of planes for reconnaissance, the increase in distance that artillery could be fired, the widespread use of chemical warfare, and, most significantly, the extensive use of machine guns, trenching became a necessity. Trench warfare training was some of the earliest training Marines received at the newly established Marine Corps Base Quantico. Both Officer and Enlisted Marines at Quantico received trench warfare training before deploying to Europe. The training trenches at Quantico were comprised of several different trench types, connected together: firing, support, local, and reserve. Trenching at MCB Quantico trained Marines on the design, construction, and concepts of trench warfare. Marines trained with blank cartridges and grenades to simulate a combat environment while simultaneously constructing and firing from the trenches.

44PW1665 is located north along the border of UXO 21. The hand excavated trench was probably used as a firing position during weapons training starting in 1935 until the end of World War II. Rifle grenades (illumination), 60 MM mortar, three-inch Stokes mortar, 4.2-inch mortar base, and smoke grenades were found in the vicinity of 44PW1665.



Figure 2. Map of Survey Area along Purvis Road

A 2005 survey of the same area noted the same trench positions. That reports also concluded that while the area may have been trenches during the Civil War no artifacts were found in the area to verify that Confederate troops were in the area (Haynes 2005). A map date March 17, 1862 shows Confederate positions; however, they are well to the east of 44PW1665 and were probably used to defend Shipping Point. The map is not accurate, but subsequent research confirmed Confederate positions in the area that were shown on the March 1862 map.

3.0 Survey Results

A pedestrian survey was conducted in the vicinity of Purvis Road in September of 2013. The purpose of the survey was to relocate previously known sites and to shovel test for sites in areas not previously surveyed.

3.0.1 STP Results

Survey Area One

STP	Depth	Soil	Artifact
STP 1	5 cm	Disturbed	Negative
STP 2	0 cm (no top soil)	Disturbed	Negative
STP 3	10 cm	No top soil	Negative
STP 4	5 cm	Disturbed	Negative
STP 5	8 cm	No top soil	Negative

Family Center Area

STP	Depth	Soil	Artifact
STP 1	20 cm	Red Clay	Negative
STP 2	No top soil	Disturbed	Negative

Veterinarian Office

STP	Depth	Soil	Artifact
STP 1	10 cm	Grey sandy loam	Negative
STP 2	No top soil	Grey sandy loam	Negative
STP 3	No top soil	Grey sandy loam	Negative

44PW1665

STP	Depth	Soil	Artifact
STP 1	No top soil	Grey sandy loam	Negative
STP 2	No top soil	Grey sandy loam	Negative
STP 3	3 cm	Grey sandy loam	Negative
STP 4	No top soil	Grey sandy loam	Negative
STP 5	5 cm	Grey sandy loam	Negative
STP 6	6 cm	Grey sandy loam	Negative

No further work is necessary to determine the absence of significant cultural resources in the APE for this undertaking. Three sites located along the road were previously recorded, two are potentially eligible for NHRP (44PW1665, 44PW1106) and a third site that is eligible (44PW1003). The expansion of Purvis road will avoid the sites.

References Cited

Fleming, Lt. Col. Capt R.L Austin, and Capt. C.A Braley, III.

1978 *Quantico, Crossroads of the Marine Corps*. History and Museum Division,
Headquarters, U.S. Marine Corps, Washington, D.C

Haynes, John

2002 *Verizon Fiber-Optic Line*. NREA report.

Appendix H
Endangered Species Act Documentation

2020 BAT SURVEY FOR FOREST MANAGEMENT AND CONSTRUCTION PROJECTS ON MARINE CORPS BASE QUANTICO, VIRGINIA

Christa Nye¹, Tomás Nocera², Michael St. Germain²

¹ Natural Resources and Environmental Affairs Branch MCB Quantico Building 27007, Stafford, VA

² Conservation Management Institute at Virginia Tech, 1900 Kraft Dr. Suite 105, Blacksburg, VA

Objective

The objective of this study is to determine which bat species occur at 10 sites slated for land disturbance at Marine Corps Base Quantico (MCBQ), Virginia. Of particular interest is the occurrence of the federally listed Northern long-eared bat and Indiana bat. The land disturbance activities include a proposed timber harvest and clearing for construction and other improvement projects. It is vital for MCBQ land managers to have the most current and robust estimations of species occurrence to efficiently and effectively conserve and manage bat populations and maintain environmental compliance.

Introduction

Over the past decade, bat conservation has become one of the most important topics in natural resource management. North American bat species are major consumers of nocturnal insects and the ecological top-down trophic control of insects these bats provide has significant ecological and economic impacts (Kunz et al. 2011). These and other potentially far-reaching trophic cascading effects emphasize the ecological importance of bat communities and their conservation. Economically, the control of crop and forest pests by bats in North America is estimated to have an approximate value of \$3.7 billion annually based on potential losses and increased pesticide requirements in their absence, a practice that would likely bear many of its own ecological consequences (Boyles et al. 2011).

North American bat species have been experiencing severe population declines throughout the northeast and central regions of the United States region (USGS National Wildlife Health Center 2018, O'Shea et al. 2016, Powers et al. 2015, Reynolds et al. 2016). To date, populations of some Myotis species have been reduced by up to 95% across their range (Blehert et al. 2009, Frick et al. 2010, Turner et al. 2011). Various factors are contributing to the decline, including the invasive fungal pathogen, *Pseudogymnoascus destructans*, which causes the infectious and fatal disease known as white-nose syndrome. The disease, has decimated cave dwelling bats during hibernation periods through eastern and mid-western North America, and continues to spread (USFWS 2018b, Ford et al. 2011). In addition, high mortality events from wind energy development has resulted in heavy population declines of migratory and forest dwelling bats (Arnett et al. 2008, Cryan and Barclay 2009, Arnett and Baerwald 2013). Furthermore, habitat loss and fragmentation from urban development and deforestation has negatively affected bat populations throughout the same region. Bats rely on forested landscapes for their summer reproductive habitat and conversely the success of juvenile recruitment into the population, with several species primarily utilizing standing snags as roost trees, thus urban development and deforestation pose a threat to this already vulnerable taxon (Silvis et al. 2016). While these factors alone have caused declines in bat populations across the region, these factors often act synergistically to further negatively affect bat populations. Therefore, conservation of bat species at any level will help preserve these imperiled and beneficial animals from further population declines.

Military readiness requires that military installations provide training areas and live fire ranges in support of the military mission. All Department of Defense (DoD) administered installations are also required to abide by all federal environmental laws, including the Endangered Species Act (ESA). ESA Section 7(a) requires federal agencies to ensure that their actions are “not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species”, and mandates that “each agency shall use the best scientific and commercial data available” to fulfill these requirements. These mandates can lead to conflicts when training activities change in response to evolving mission requirements. The presence of federally threatened or endangered bat species within a proposed action area can mean heightened regulatory scrutiny on resource utilization and development, with the potential need for consultation with the U.S. Fish and Wildlife Service (USFWS) under ESA section 7. Therefore, it is necessary for installation natural resource managers to have the best information available to act proactively in avoiding conflicts between military training and environmental compliance.

Methods

We deployed 28 Songmeter SM-4 acoustic units and 3 Songmeter SM-3 acoustic units (Wildlife Acoustics, Inc. Maynard, MA) to record bat calls along 10 forested sites with MCBQ to support a proposed timber harvest and various construction and improvement projects. To maximize effort and minimize biases at each of the 10 sites we deployed at least two acoustic units of the same make and model. Within each site we deployed a set of detectors to sufficiently cover the entire site acreage for a total of 221 detector nights between 19 May and 30 June 2020, (Table 1). The sites that were surveyed include: Purvis Road Expansion (2.5 miles) with 5 detectors placed equidistant apart across the linear route; Delaney Street New Energy Facility (3 acres) with 2 detectors placed along a trail; Ambush Alley Trail Reroute (0.26 mile); with 2 detectors placed on the new route; Ronnies Run Trail Reroute (0.11 mile); with 2 detectors placed on the new route; MCIA New Campus Facility (18 acres) with 2 detectors placed at the proposed clearing site; VRE Parking Lot Expansion (0.47 acre) with 2 detectors placed in the forested zone within the proposed expansion; Battery Trail Trail Reroute (1 mile) with 4 detectors placed on the new route; Goettge Demolition Tree Clearing (5.6 acres) with 2 detectors placed in the forest compartment; Lunga Reservoir Building Demolition with 2 detectors placed facing the buildings set to be demolished; TDSA Timber Harvest Project (183 acres) with 8 detectors placed in the 4 forest compartments (2 within each compartment). All sampling followed the US Fish and Wildlife Service (USFWS) 2020 Range-Wide Indiana Bat Survey Guidelines (USFWS 2020). Acoustic detectors were placed in areas within the projects location that would amount to the highest probability of detection. These included suitable foraging corridors, roost trees, creeks and other water sources, and trails with closed canopies (Kunz and Kurta 1988, Murray et al. 1999).

All raw acoustic data were analyzed using USFWS-approved software Kaleidoscope Pro v5.1.8 (Wildlife Acoustics 2020). Following USFWS requirements and software program recommendations we used the approved sensitivity setting of (0) with a 95% confidence from the maximum likelihood estimator ($\alpha < 0.05$) screening for eleven bat species whose ranges include northern Virginia (Table 2).

Table 1. Site names, location, and detector deployment dates at Marine Corps Base Quantico, Virginia, 19 May – 30 June, 2020.

Site Names	Deployment Dates	Location		Detector Model
GDR_01	19 May - 26 May	277377	4272691	SM4
GDR_02	26 May - 4 June	277385	4272814	SM4
Ambush_Alley_01	20 May - 27 May	296958	4266351	SM4
Ambush_Alley_02	20 May - 27 May	297087	4266346	SM4
Ronnies_Run_01	20 May - 27 May	296968	4266946	SM4
Ronnies_Run_02	20 May - 27 May	296923	4266893	SM4
MCIA_01	20 May - 27 May	298233	4265573	SM4
MCIA_02	27 May - 9 June	298321	4265572	SM4
VRE_01	22 June - 26 June	299954	4265942	SM4
VRE_02	22 June - 26 June	299986	4265918	SM4
Delaney_Street_01	20 May - 27 May	295780	4267140	SM3
Delaney_Street_02	27 May - 9 June	295761	4267137	SM3
Purvis_Road_01	20 May - 27 May	295537	4266053	SM4
Purvis_Road_02	20 May - 27 May	295326	4266715	SM4
Purvis_Road_03	20 May - 27 May	295528	4267574	SM4
Purvis_Road_04	20 May - 27 May	295950	4267952	SM4
Purvis_Road_05	20 May - 27 May	297110	4268016	SM4
ETA_01	28 May - 5 June	293648	4264133	SM4
ETA_02	28 May - 5 June	293658	4264601	SM4
ETA_03	28 May - 5 June	293869	4263840	SM4
ETA_04	28 May - 5 June	2940326	4263880	SM4
ETA_05	28 May - 5 June	294591	4265174	SM4
ETA_06	28 May - 5 June	294508	4265202	SM4
ETA_07	28 May - 5 June	295023	4265045	SM4
ETA_08	28 May - 5 June	295133	4265175	SM3
LUNGA_01	29 May - 4 June	285540	4267005	SM4
LUNGA_02	29 May - 4 June	285662	4267164	SM4
Battery_Trail_01	9 June - 12 June	300307	4267328	SM4
Battery_Trail_02	9 June - 12 June	300272	4267436	SM4
Battery_Trail_03	26 June - 30 June	300204	4267496	SM4
Battery_Trail_04	26 June - 30 June	300238	4267615	SM4

Table 2. Species included for screening of acoustic files with Kaleidoscope Pro v5.1.8 software at Marine Corps Base Quantico, Virginia, 19 May – 30 June, 2020.

Species Code	Common Name	Scientific Name
EPFU	Big brown bat	<i>Eptesicus fuscus</i>
LABO	Eastern red bat	<i>Lasiurus borealis</i>
LACI	Hoary bat	<i>Lasiurus cinereus</i>
LANO	Silver-haired bat	<i>Lasionycteris noctivagans</i>
MYLU†	Little brown bat	<i>Myotis lucifugus</i>
MYSE*	Northern long-eared bat	<i>Myotis septentrionalis</i>
MYSO*	Indiana bat	<i>Myotis sodalis</i>
NYHU	Evening bat	<i>Nycticeius humeralis</i>
PESU†	Tri-colored bat	<i>Perimyotis subflavus</i>
TABR	Mexican free-tailed bat	<i>Tadarida brasiliensis</i>
* Denotes federally threatened or endangered species		
† Denotes species considered threatened or endangered in the state of Virginia		

Results

Nine of the ten bat species known to be present on MCINCR-MCBQ were detected. Maximum likelihood estimates for the sites surveyed provide evidence for the presence of big brown bat (*Eptesicus fuscus*, EPFU), eastern red bat (*Lasiurus borealis*, LABO), hoary bat (*Lasiurus cinereus*, LACI), silver haired bat (*Lasionycteris noctivagans*, LANO), little brown bat (*Myotis lucifugus*, MYLU), tri-colored bat (*Perimyotis subflavus*, PESU), evening bat (*Nycticeius humeralis*, NYHU), Mexican free-tailed bat (*Tadarida brasiliensis*, TABR), and Northern long-eared bat (*Myotis septentrionalis*, MYSE) between all of the twelve sites surveyed (Table 3). Presence of MYLU and PESU, state threatened and endangered bat species was detected along Battery Trail, Delaney Street, ETA, Lunga Reservoir, Purvis Road, and Ronnie's Run, with MYLU also being present at MCIA. Presence of MYSE, federally threatened species, was detected at ETA Site 8 (Forest compartment 4). See Below for a breakdown of each site and the maximum likelihood estimation for each species with potential occurrence on MCINCR-MCBQ.

Discussion

This survey detected two state listed threatened and endangered species along six of the ten sites sampled in each proposed construction and timber harvest sites. Presence of the federally threatened Northern long-eared bat was only detected at one forest compartment site within TDSA. Tree removal work within TDSA forest compartments should adhere to the appropriate time-of-year restriction to avoid potential impacts to state and federally listed species. If tree clearance occurs between 1 August and 31 May, these projects should have limited impacts on the bat populations at MCINCR-MCBQ.

PROJECT: PURVIS ROAD

Site Description

Site 1 (Purvis Road 01): This site is located within a forested section adjacent to Purvis Road within a deciduous hardwood forest. Vegetation consists of American beech (*Fagus grandifolia*), white oak (*Quercus alba*), and red maple (*Acer rubrum*) in the overstory and understory. Dense woody vegetation such as sweet gum (*Liquidambar styraciflua*) and American beech (*Fagus grandifolia*) is regenerating and has replaced the herbaceous layer at this site. See Figure 1 for site location.

Site 2 (Purvis Road 02): This site is within a deciduous hardwood forest stand along an opening and dried stream corridor. Overstory canopy cover is dense with patches of understory consisting of low shrubs and woody vegetation. The site vegetation consists of American beech (*Fagus grandifolia*) and red maple (*Acer rubrum*) with clusters of snags. See Figure 1 for site location.

Site 3 (Purvis Road 03): This site is within a deciduous hardwood forest along a stream bed adjacent to a Purvis Road. Understory is sparse with a dense overstory and snags. Site vegetation consists of white oak (*Quercus alba*), red maple (*Acer rubrum*), and American beech (*Fagus grandifolia*). Herbaceous layer consists of ferns at this site. See Figure 1 for site location.

Site 4 (Purvis Road 04): This site is located along a forested trail leading to a forest wetland. The site has an open canopy with little herbaceous layer understory. Snags are abundant within the forested wetland, and the site is in a deciduous forest consisting of hickory (*Carya sp.*) and white oak (*Quercus alba*). See Figure 1 for site location map.

Site 5 (Purvis Road 05): This site is located adjacent to a forested stream and Purvis road near Fuller Road. The site is situated on an upland deciduous forest which slopes down into a stream, where vegetation consists of American beech (*Fagus grandifolia*), red maple (*Acer rubrum*) and white oak (*Quercus alba*) in the overstory and understory. Closed Canopy structure with snags in the mid-story. See Figure 1 for site location.

Results:

Eight of the ten bat species known to be present on MCINCR-MCBQ were detected. Maximum likelihood estimates for the sites surveyed provide evidence for the presence of big brown bat (*Eptesicus fuscus*, EPFU), eastern red bat (*Lasiurus borealis*, LABO), hoary bat (*Lasiurus cinereus*, LACI), silver haired bat (*Lasionycteris noctivagans*, LANO), little brown bat (*Myotis lucifugus*, MYLU), tri-colored bat (*Perimyotis subflavus*, PESU), evening bat (*Nycticeius humeralis*, NYHU), Mexican free-tailed bat (*Tadarida brasiliensis*, TABR), between all of the five sites surveyed on Purvis Road (Table 3). No federal threatened or endangered bats were detected during the survey. However, presence of MYLU and PESU, state threatened and endangered bat species was detected. See Table 3 for a breakdown of each site and the maximum likelihood estimation for each species with potential occurrence on MCINCR-MCBQ.

Discussion

This survey detected two state listed threatened and endangered species along each of the five sites of sampled along the road. While presence of federally threatened and endangered bat species have been

detected across MCINCR-MCBQ, within the period of this study none were detected at these sites. Tree removal work along this site should adhere to the appropriate time-of-year restriction to avoid potential impacts to state listed species and, as such, these projects should have limited impacts on the bat populations at MCINCR-MCBQ.

Table 3. Maximum likelihood estimation ($\alpha \leq 0.05$, probability of misidentification) for each species with potential occurrence on Purvis Road Expansion Site Marine Corps Base Quantico, Virginia. Output is from Kaleidoscope v 5.1.8. 20 May - 26 May, 2020. * Denotes federally threatened or endangered species; † Denotes species considered threatened or endangered in the state of Virginia.

[illegible]

Figure 1: Purvis Road Acoustic Site Locations for 2020 Survey period between May 20th and May 27th, 2020

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UNITED STATES MARINE CORPS
MARINE CORPS INSTALLATIONS NATIONAL CAPITAL REGION
MARINE CORPS BASE
3250 CATLIN AVENUE
QUANTICO, VIRGINIA 22134 5001

IN REPLY REFER TO:

11015/1

B 046

2 July 2020

MEMORANDUM FOR THE RECORD

From: Head, Fish, Wildlife, & Agronomy Program, Natural Resources
and Environmental Affairs Branch

To: File

Subj: SMALL WHORLED POGONIA (SWP) SURVEY FOR THE REPAIR OF PURVIS
ROAD

Encl: (1) Site Location Map
(2) Photographs of Site

1. The proposed Purvis Road Repair project includes repaving and addition of gravel shoulders to Purvis Road. While disturbance of adjacent forested areas is not expected, a SWP survey was conducted in order to determine potential impacts along the associated drainages. A site location map is included as Enclosure (1).

2. Site suitability for the SWP was evaluated by Christa Nye on 2 July 2020.

3. Currently, the site consists of maintained roadway adjacent to streams with open turf grass areas and scrub-shrub habitat. These areas are not suitable SWP habitat. Forested areas adjacent to the youth and child development centers consist of suitable SWP habitat. See Enclosure (2) for site photographs.

4. Vegetation within the forested areas consisted of dense Japanese stilt grass (*Microstegium vimineum*), wineberry (*Rubus phoenicolasius*), New York fern (*Thelypteris noveboracensis*), tulip poplar (*Liriodendron tulipifera*), and oak species (*Quercus spp*).

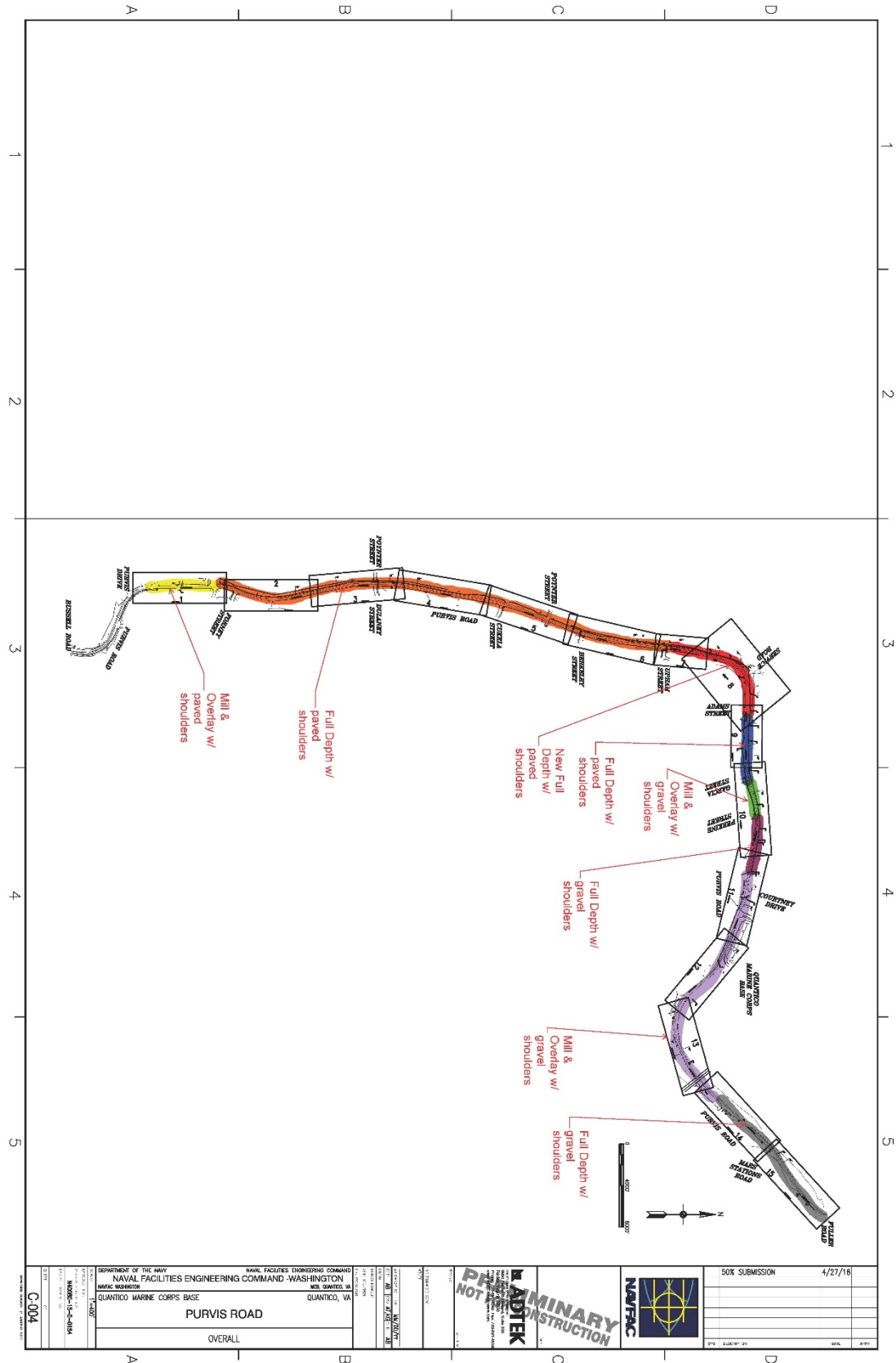
5. No SWP were found during the site survey.

6. The proposed repairs to Purvis Road will not adversely affect the threatened small whorled pogonia.

Christa Nye

Copy to:
Head, NEPA Program

FILE: C:\Program Files\Microsoft Visual Studio\2008\Tools\Windows SDK\bin\x86\WinSxS\x86-Microsoft-Windows-Common-rtm\WinSxS-Setup-Engine\WinSxS-Setup-Engine.exe



Encl (2):



Typical habitat near road and road shoulders.



Forested area near the youth and child development center.



Forested area near the youth and child development center.



Forested area near the youth and child development center.



Forested area near the youth and child development center.



Forested area near the youth and child development center.

Appendix I
Construction Waste Management Report

Construction Waste Management Report Quantico Marine Corps Base

Report Date: _____
 Project Number: _____ Project Name: _____
 Contract Number: _____ Contract Task Order/Delivery Order: _____
 Reporting Period: _____ to _____

RETURN THIS FORM TO marilisa.porter@usmc.mil FAX (703) 784-6335

REPORTS MUST BE TURNED IN MONTHLY
ANNUAL TURNINS ARE CASE BY CASE ONLY

Comments: _____

Waste Stream	Disposal (Tons)	Disposal Cost	Recycled (Tons)	Recycled Cost	Recycled Revenues
Landfill		\$		\$	\$
Incinerated		\$		\$	\$
Composted		\$		\$	\$

For each landfill and/or incinerator, provide name, city, county, state and tipping fee. If there are multiple landfills, please annotate below on the additional lines provided.

Name	City, County, State	Tipping Fee
Name	City, County, State	Tipping Fee
Name	City, County, State	Tipping Fee
Name	City, County, State	Tipping Fee

Recycling Breakdown (Qty should add up to recycled tons)

Category	Tons
Food	
Glass	
Metals (Brass .50 cal and below)	
Metals (excluding brass)	
Other (non-food, describe in comments)	
Paper and Paperboard	
Cardboard	

NREA Rcvd: _____
FY Reporting Period: _____

Plastic	
Wood	
Yard/Green Waste	

Comments: _____

CONSTRUCTION & DEMOLITION DEBRIS (C&D).

- Record hazardous and non-hazardous C&D waste as one entry. Enter total tons of C&D disposed of in a landfill, by incineration, and/or by hazardous waste contract.
- Enter total disposal cost for C&D.
- Enter the recycled hazardous and non-hazardous C&D tons as one entry under the recycling column. You can also claim C&D diversion conducted by a construction contractor or MILCON project. If you have recycled C&D, it is likely that some was disposed of as well. Therefore, if there are recycled tons of C&D there should be some disposed tons of C&D.
- Enter the cost associated with recycling. Recycling costs include handling, processing, transportation, and other costs associated with recycling C&D. Soils that are used at another location or that are reclaimed count toward recycling.
- Enter Recycling Revenues. Enter only actual revenues received from recycling. Do not enter cost avoidance for recycling revenues.

Reported by:

Company: _____ Contact: _____

Address: _____ Title: _____

_____ E-mail address: _____

Telephone: _____

Fax: _____

Definitions:

Construction and Demolition (C&D) Debris. Waste derived from the construction, renovation, demolition or deconstruction of residential and commercial buildings and their infrastructure. C&D waste typically includes concrete, wood, metals, gypsum wallboard, asphalt, and roofing material.

Other Select Waste (OSW). Construction and demolition debris are the “Other Select Waste” categories for purposes of DoD metric reporting via SW module. If the Other Select Wastes are hazardous they must also be reported in the calendar year HW module.

Appendix J

Acronyms

The following list of abbreviations and acronyms are commonly used in Navy and USMC environmental planning documents and are presented to ensure they are applied in a consistent manner throughout all Navy and USMC environmental planning documents.

μPa - micropascal
AAQS - Ambient Air Quality Standard
ACoE – Army Corps of Engineers
AGL - above ground level
AICUZ - Air Installation Compatible Use Zone
AO - Area of Operations
AOR - Area of Responsibility
APE - Area of Potential Effect
APZ - Accident Potential Zone
ARPA - Archaeological Resources Protection Act
ATC - air traffic control
ATFP - Antiterrorism Force Protection
BA - Biological Assessment
BASH - bird/aircraft strike hazard
BE - Biological Evaluation
BEQ - bachelor enlisted quarters
BMP - best management practice
BO - Biological Opinion
BOQ - bachelor officers quarters
CAA - Clean Air Act
CEQ - Council on Environmental Quality
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
CFR - Code of Federal Regulations
CHPPM - Center for Health Promotion and Preventive Medicine
CNIC - Commander Navy Installations Command
CO - carbon monoxide
CO₂ - carbon dioxide
CWA - Clean Water Act
CZMA - Coastal Zone Management Act
dB - decibel
dBA - A-weighted sound level
dBC - C-weighted sound level
dBP - peak decibel
DEIS - Draft Environmental Impact Statement
DNL - day-night average sound level
DoD - United States Department of Defense
DON - United States Department of the Navy
DZ - drop zone
EA - Environmental Assessment
EAP - Encroachment Action Plan
EFH - Essential Fish Habitat
EIS - Environmental Impact Statement

EO - Executive Order
EOD - explosive ordnance disposal
ESA - Endangered Species Act
EPCRA - Emergency Planning and Community Right-to-Know Act
ESQD - explosive safety quantity distance
FAA - Federal Aviation Administration
FEIS - Final Environmental Impact Statement
FIFRA - Federal Insecticide, Fungicide, and Rodenticide Act
FONSI - Finding of No Significant Impact
FY - fiscal year
GHG - greenhouse gas
GIS - geographic information system
HAP - hazardous air pollutant
HAPC - habitat areas of particular concern
HE - high explosive
ICRMP - Integrated Cultural Resources Management Plan
INRMP - Integrated Natural Resources Management Plan
IRP - Installation Restoration Program
kHz - kilohertz
LBP - lead based paint
MCAF - Marine Corps Air Facility
MCB - Marine Corps Base
MCCS – Marine Corps Community Services
MCO - Marine Corps Order
MEC - Munitions and Explosives of Concern
MEM - military expended material
MILCON - military construction
MLLW - mean lower low water
MMRP - Military Munitions Response Program
MOA - Military Operations Area
MSFCMA - Magnuson-Stevens Fishery Conservation and Management Act
MSL - mean sea level
MTR - military training route
NAAQS - National Ambient Air Quality Standards
NAGPRA - Native American Graves Protection and Reparation Act
NAVFAC - Naval Facilities Engineering Command
NEPA - National Environmental Policy Act
NEW - net explosive weight
NHPA - National Historic Preservation Act
NO2 - nitrogen dioxide
NOA - notice of availability
NOI - Notice of Intent
NPDES - National Pollutant Discharge Elimination System
NPS - National Park Service
NRHP - National Register of Historic Places
OPNAV - Office of the Chief of Naval Operations

OPNAVINST - Office of the Chief of Naval Operations Instruction
PAH - polynuclear aromatic hydrocarbon
PCB - polychlorinated biphenyl
PM10 - particulate matter less than or equal to 10 microns in diameter
PM2.5 - particulate matter less than or equal to 2.5 microns in diameter
Ppb - parts per billion
Ppm - parts per million
Ppt - parts per thousand
PPV - public/private venture
PTS - permanent threshold shift
RAICUZ - Range Air Installation Compatible Use Zone
RCMP - Range Complex Management Plan
RCRA - Resource Conservation and Recovery Act
ROD - Record of Decision
RONA - Record of Non-Applicability
SAV - submerged aquatic vegetation
SEL - sound exposure level
SHPO - State Historic Preservation Officer
SIP - State Implementation Plan
SO2 - sulfur dioxide
SPL - sound pressure level
TSCA - Toxic Substances Control Act
TTS - temporary threshold shift
U.S.C. - United States Code
UAV - unmanned aerial vehicle
USEPA - U.S. Environmental Protection Agency
USFWS - U.S. Fish and Wildlife Service
USGS - U.S. Geological Survey
USMC - U.S. Marine Corps
UXO - unexploded ordnance