Statement of Glenda C. Booth, President, Friends of Dyke Marsh to the Virginia Marine Resources Commission on Application #17-0921 to Restore Dyke Marsh March 27, 2018

Thank you for the opportunity to present the views of the Friends of Dyke Marsh on the National Park Service's application to restore Dyke Marsh, a valuable, freshwater tidal marsh on the Potomac River in Fairfax County, part of the George Washington Memorial Parkway unit of the National Park Service.

The Friends of Dyke Marsh is a nonprofit, volunteer, conservation group founded in 1976, 42 years ago, because local people feared for the survival of the marsh. We have advocated for marsh conservation, stabilization and restoration for 42 years. We partner with the National Park Service through a memorandum of agreement.

Congress created the National Park Service to preserve and protect our nation's greatest treasures. NPS's mission is as follows: "The National Park Service preserves unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations." The NPS authorizing law, the Organic Act of 1916, states as NPS's mission, to "conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

Dyke Marsh Is Disappearing

We are here today because Dyke Marsh is not only *impaired,* it is *disappearing*. U.S. Geological Survey scientists concluded in a comprehensive 2010 study and a 2013 update that the marsh is eroding six to eight feet or 1.5 to two acres per year a year on average, at an accelerating rate "which now appears to put at risk the short-term survivability of this marsh." Dyke Marsh will be *totally gone by 2035* without action. USGS reported, "We ultimately conclude that Dyke Marsh presently is in its late stages of failure as a freshwater tidal marsh system . . . Erosion is fragmenting the marsh and dismantling tidal creek networks by stream piracy. In the absence of human efforts to restore the equilibrium between marsh and tide, and equilibrium to the other natural forces acting on this wetland, Dyke Marsh likely will continue to accelerate its degradation, erosion and fragmentation until it is gone. This likely will occur prior to 2035 AD."

Between 1940 and 1972, Smoot, Sand and Gravel hauled away 270 acres of marsh, reducing the marsh by around 54 percent. NPS estimates that the marsh was once around 380 acres in size; today it is around 50 acres. USGS experts concluded that the dredging of sand and gravel from 1940 to 1972 was a strong destabilizing force, transforming the wetland from a net depositional state to a net erosional state.

USGS specifically pointed to the dredgers' removal of the promontory near the south end of the marsh as a major contributor to the marsh's destabilization, stressing that it removed the geologic wave protection that existed back to at least 1864 and altered the size and function of the tidal creek network. The

USGS study stated that the minimal protection needed to protect and enhance natural deposition includes a wave break in the location of the former, removed promontory.

Restoration Go-ahead, Congressional Directives, General Assembly Support

In 2004, NPS hosted a kickoff meeting for this project, that included representatives from the Virginia Institute of Marine Science, the Virginia Department of Game and Inland Fisheries, NPS, the Friends of Dyke Marsh, university scientists and others. All parties at that meeting agreed that restoration is both "feasible and desirable." Thus, NPS proceeded to develop a restoration plan.

Parts of the marsh are 2,200 years old. In 1959, in Public Law 86-41, Congress specifically designated it as a wetland preserve, "so that fish and wildlife development and their preservation as wetland wildlife habitat shall be paramount." Therefore, Congress's intent is clear.

Congress has directed NPS to restore Dyke Marsh:

- In the 1959 legislative history, one sponsor, then-Congressman John Dingell, said, "We expect that the Secretary will provide for the deposition of silt and waste from the dredging operations in such a way as to encourage the restoration of the marsh at the earlier possible moment." The Senate Committee on Public Works report indicated that "future reclamation" was expected. (Number 280, 86th Congress, May 11, 1959)
- In 1974, Congress authorized the U.S. Army Corps of Engineers to assist NPS in restoring the "historic and ecological values of Dyke Marsh." (P.L. 93-251)
- In 2007, Congress stated that Dyke Marsh should be restored. (H.R. 1495, Water Resources Development Act, Section 5147)
- In 2009, the U.S. House of Representatives approved House Resolution 701 and in 2010, the U.S. Senate approved Senate Resolution 297, supporting restoration and recognizing the marsh as a significant ecosystem.

The Virginia General Assembly has given support, in 2016 approving Senate Joint Resolution 190 recognizing Dyke Marsh as a "valuable natural resource" and supporting its restoration.

Public Funds Spent and Available

To get to this point, NPS has spent $3.8 million in public dollars on scientific studies, engineering plans, the environmental impact statement, public meetings and other work.

Fortunately, funds are available to start restoration. The Department of Interior awarded the National Park Service a $24.9 million grant specifically for restoration. Another $1 million in

mitigation funds are available from the Federal Airport Administration and another $4 million will be available this spring from the Washington Metropolitan Area Transportation Authority.

A Well-Studied Marsh

Dyke Marsh is one of the best studied, freshwater tidal marshes in North America. The natural resources present are well documented, including some species listed by Virginia as threatened or endangered. NPS has conducted studies on restoration feasibility, erosion, soils, elevations and the diversity of vegetation communities and their topographic positions. NPS has conducted or sponsored geotechnical investigations, hydraulic and hydrologic modeling, sediment transport modeling, wave analysis, bathymetric surveys and prepared an extensive environmental impact statement with ample public involvement. NPS and others have conducted inventories of marsh vegetation and plant communities, surveys of birds, butterflies, dragonflies, damselflies, other insects, spiders, reptiles and amphibians. A beetle new to Virginia was found at Dyke Marsh in 2014.

I have included at the end of this statement a list of 15 relevant papers omitted from the VIMS report. It is especially disappointing that VIMS, in their December 1, 2017, submission to you, in the "Literature cited," did not include the U.S. Geological Survey 2010 and 2013 studies, *the very foundation for this application*.

Broad, Deep Support

The Fairfax County Wetlands Board approved a permit (WB 17-W-04) on September 12, 2017 on a five to zero vote. It became effective on September 22, 2017.

Restoring Dyke Marsh has broad public support and support from many elected officials. You have letters from U.S. Senator Tim Kaine, who attended the $24.9 million grant announcement in the marsh; U.S. Senator Mark Warner; Virginia Congressmen Don Beyer, Gerry Connolly and Donald McEachin; Virginia State Senators Richard Saslaw, Adam Ebbin, George Barker, Barbara Favola and Scott A. Surovell; Delegates Paul Krizek, Mark Levine, Rip Sullivan, Patrick Hope, David Bulova, Kaye Kory and Mark Sickles; and Fairfax County, Mount Vernon District Supervisor Dan Storck. The Fairfax County Board of Supervisors and the Alexandria City Council have expressed support for restoration.

You have also received supportive letters, for example, from the Interstate Commission on the Potomac River Basin, the Potomac Conservancy, the National Parks Conservation Association, the Potomac Riverkeeper Network, Trout Unlimited/Virginia Council, the Virginia Conservation Network, the Virginia Society of Ornithology, Mount Vernon Estate and Gardens, the Fairfax County History Commission, among others. You have two letters from two University of Maryland scientists who have done extensive research in the marsh on ecogeomorphic processes that allow emergent plant communities to be diverse and persist with changing sea level and on sediment and vegetation dynamics.

Consistent with VMRC and Chesapeake Bay Goals

It is my understanding that you are charged with taking several factors into account in making your decision, including these:

- The Constitution of Virginia, section 1, which states as the Commonwealth's policy to "conserve, develop, and utilizes its natural resources, its public lands, and is historical sites and buildings . . . and "protect its atmosphere, lands, and waters from pollution, impairment, or destruction, for the benefit, enjoyment, and general welfare of the people of the Commonwealth"; and
- in Title 28, the public and private benefits and the project and its effect on other uses of state-owned waters and bottomlands; marine and fisheries resources; tidal wetlands; adjacent or nearby properties; and water quality.

You are also charged, in Title 28.2.1301 with preserving and preventing "the despoliation and destruction of wetlands while accommodating necessary economic development in a manner consistent with wetlands preservation."

Virginia has made multiple commitments under the Chesapeake Bay agreements. Virginia committed to "no net loss of existing wetland acreage and functions," to be realized, among other approaches, through wetlands restoration. Virginia also committed, in general, to protect, restore, enhance and sustain fisheries and fish habitats; to restore, enhance and protect wildlife habitat; to restore, enhance and protect wetland habitats; to sustain and increase the habitat benefits of underwater grasses (submerged aquatic vegetation, SAV); increase water quality in several ways, including an increase in forest buffers; reduce sediments. In terms of SAV, the agreement does not appear to give explicit preference to native SAV, but it is my understanding that Chesapeake Bay program managers do. For example, the Chesapeake Bay Foundation only funds native SAV in its underwater planting program.

We believe that this application to restore Dyke Marsh will help VMRC and Virginia fulfill its commitments under state law and in the Chesapeake Bay Agreements.

Our Request

Virginia has lost between 40 and 45 percent of its wetlands since colonial times. Approval of this application presents VMRC and the state of Virginia a rare opportunity to restore a valuable state, national and natural resource. Funds are available; support is broad and strong. We urge you to vote yes and approve application #17-0921 today.

Peer-reviewed Publications on Dyke Marsh Not Included in the VIMS report

Cadol, D., K.A.M. Engelhardt, A. Elmore, and G. Sanders, 2014. Elevation-dependent surface elevation gain in a tidal freshwater marsh and implications for marsh persistence. Limnology and Oceanography 59: 1065-1080.

Barrows, E.M., S.B. Arsenault, & N.P. Grenier. 2008. Firefly (Coleoptera: Lampyridae) flight periods, sex ratios, and habitat frequencies in a United States Mid-Atlantic freshwater tidal marsh, low forest, and their ecotone. Banisteria 31:47-52.

Barrows, E.M. & O.S. Flint. 2009. Mecopteran (Mecoptera: Bittacidae, Meropeidae, Panorpidae) flight periods, sex ratios, and habitat frequencies in a United States Mid-Atlantic freshwater tidal marsh, low forest, and their ecotone. Journal of the Kansas Entomological Society 82:223-230.

Elmore, A.J., K.A.M. Engelhardt, D. Cadol, and C.M. Palinkas, 2016. Spatial patterns of plant litter in a tidal freshwater marsh and implications for marsh persistence. Ecological Applications 26: 846-860.

Hopfensperger, K.N. & A.H. Baldwin. 2009. Spatial and temporal dynamics of floating and drift-line seeds at a tidal marsh on the Potomac River, USA. Plant Ecology 201:677-686.

Hopfensperger, K.N. & K.A.M. Engelhardt. 2007. Coexistence of *Typha angustifolia* and *Impatiens capensis* in a tidal freshwater marsh. Wetlands 27:561-569.

Hopfensperger, K.N. & K.A.M. Engelhardt. 2008. Annual species abundance in a tidal freshwater marsh: germination and survival across an elevational gradient. Wetlands 28:521-526.

Hopfensperger, K.N., K.A.M. Engelhardt, & T.R. Lookingbill. 2009. The seed bank and vegetation dynamics in a tidal freshwater marsh. Journal of Vegetation Science 20:767-778.

Hopfensperger, K.N., K.A.M. Engelhardt, & S.W. Seagle. 2006. The use of case studies in establishing feasibility for wetland restoration. Restoration Ecology 14:578-586.

Hopfensperger, K.N., K.A.M. Engelhardt, & S.W. Seagle. 2007. Ecological feasibility studies in restoration decision-making. Environmental Management 39:843-852.

Hopfensperger, K.N., S.S. Kaushal, S.E.G. Findlay, & J.C. Cornwell. 2009. Influence of plant communities on denitrification in a tidal freshwater marsh on the Potomac River, U.S.A. Journal of Environmental Quality 38:618-626.

Litwin, R.J., J.P. Smoot, M.J. Pavich, E. Oberg, B. Steury, B. Helwig, H.W. Markewich, V.L. Santucci, & G. Sanders. 2013. Rates and probable causes of freshwater tidal marsh failure, Potomac River Estuary, Northern Virginia, USA. Wetlands 33:1037-1061.

Myrick, R.M., & Leopold, L.B. 1963. Hydraulic geometry of a small tidal estuary: U.S. Geological Survey Professional Paper 422-B, 18 p.

Palinkas, C.M. and K.A.M. Engelhardt, 2016. Spatial and temporal patterns of modern (~100-y) sedimentation in a tidal freshwater marsh: implications for future marsh sustainability. Limnology and Oceanography 61: 132-148.

Palinkas, C.M., K.A.M. Engelhardt, & D. Cadol. 2013. Evaluating physical and biological influences on sedimentation in a tidal freshwater marsh with ^{7}Be. Estuarine, Coastal and Shelf Science 129:152-161.

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