APPENDIX – Q

STAKEHOLDER COORDINATION, REV1

I-64 Hampton Roads Bridge-Tunnel Expansion Project

Hampton Roads Connector Partners
240 Corporate Blvd. 4th floor
Norfolk, VA 23502

Hampton-Norfolk, Virginia
December 19, 2019

DOCUMENT HISTORY

Issue Date	Description	By	Revision
December 19, 2019	Added additional meetings and correspondence undertaken since the August 30th JPA submission. In addition, official correspondence has been added to this document as well	C Benson	1

ATTACHMENTS

Attachment Q-1 - Stakeholder Meetings and presentations

Attachment Q-2 - Official Correspondence

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TABLES

Q. STAKEHOLDER COORDINATION

Q.1 INTRODUCTION

The proposed HRBT Expansion Project will improve a section of Interstate 64 (I-64) that provides an important regional transportation link between the cities of Hampton and Norfolk, Virginia. The Project will address severe traffic congestion and will widen I-64 for approximately 9.9 miles along I-64 from Settlers Landing Road in Hampton, Virginia to the I-64/I-564 interchange in Norfolk, Virginia. The Project will create an eight lane facility with six consistent use lanes. The expanded facility will include four general purpose lanes, two new HOT lanes, and two new drivable (hard-running) shoulders to be used as HOT lanes during peak usage.

The Project will include full replacement of the North and South Trestle Bridges, two new parallel tunnels constructed using a Tunnel Boring Machine (TBM), expansion of the existing portal islands, and widening of the Willoughby Bay Trestle Bridges, Bay Avenue Trestle Bridges, and Oastes Creek Trestle Bridges. Also, upland portions of I-64 will be widened to accommodate the additional lanes, the Mallory Street Bridge will be replaced, and the I-64 overpass bridges will be improved.

This Appendix has been included to document the preliminary meetings and coordination efforts with regulatory agencies and stakeholders. Two groups of information have been provided as part of the stakeholder coordination efforts including:

- **Attachment Q-1 – Stakeholder Coordination Meetings and Presentations -** Meeting minutes and presentation materials have been included for the meetings conducted in chronological order starting in August of 2018 as Attachment Q-1. Page numbers for Attachment Q-1 have been included in to allow for quick access to these meeting minutes. Furthermore, Table Q-2also illustrates the regulatory agencies and stakeholders in attendance.
- **Attachment Q-2 – Official Correspondence** – Official responses and letters related to the environmental permitting aspects of the Project have listed chronologically in Table Q-3. The full transmittals have been included in Attachment Q-2.

Table Q-1: Table of Stakeholders with their Acronyms

Acronym	Agency or Stakeholder Group
USACE	U.S. Army Corps of Engineers
VDEQ	Virginia Department of Environmental Quality
VMRC	Virginia Marine Resources Commission
VIMS	Virginia Institute of Marine Science
NOAA-NMFS	National Oceanic and Atmospheric Administration National Marine Fisheries Service
FHWA	Federal Highway Administration
USN	U. S. Navy
USCG	United States Coast Guard
VCU	Virginia Commonwealth University
DGIF	Virginia Department of Game and Inland Fisheries
VA Port Auth	Virginia Port Authority
VHSC	Virginia Harbor Safety Committee
Norfolk / Hampton / Pilots	City of Norfolk / City of Hampton / Virginia Pilots
EPA	United States, Environmental Protection Agency

Table Q-2: Table of Stakeholder Coordination Meetings and Presentations

#	Agency Meeting	Pages	Date of Meeting	Meeting Minutes	Presentation Data	USACE	VDEQ	VMRC	VIMS	NOAA -NMFS	FHWA	USN	USCG	VCU	DGIF	VA Port Auth	VHSC	EPA	Others
1	HRBT Agency Meeting	2-4	8/10/2018	Yes	N/A	X	X	X		X									
2	HRBT _ Agency Conference Call	6-10	9/26/2018, 10/4/2018, & 10/19/18	Yes	N/A	X	X	X	X	X									
3	Section 408 Stakeholder Coordination for Marine Geotechnical Investigations	12-15	1/25/2019	Yes	N/A	X							X						
4	HRBT Agency Update Meeting	17 - 31	3/27/2019	Yes	Power Point	X	X	X	X		X								
5	HRBT Agency Update Meeting	33-51	4/24/2019	Yes	Power Point	X	X	X	X		X								
6	HRBT Expansion Project –Section 408 Meeting with Maritime Stakeholders	53-55	4/30/2019	Yes	N/A							X				X			
7	VPDES Sampling Plan and Analysis - Webinar	57-71	5/22/2019	Yes	Power Point	X	X		X										
8	HRBT Agency Update Meeting	73-92	5/29/2019	Yes	Power Point	X	X	X	X	X									
9	HRBT Agency Update Meeting	94-115	6/28/2019	Yes	Power Point	X	X	X	X	X	X								
10	Pile Driving Meeting	117-129	6/28/2019	Attendee List	Power Point	X	X	X		X	X								
11	JPA Pre-Application Meeting	131-189	7/10/2019	Yes	Power Point	X	X	X	X										

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12	U.S. Coast Guard Bridge Permit Coordination Meeting	191-221	7/24/2019	Yes	Power Point						X		X						
13	Virginia DGIF Update and Anadromous Fish Discussion (DGIF Meeting)	223-248	7/25/2019	Yes	Power Point									X	X				
14	VPDES Industrial Discharge Permit Pre-App Meeting	250-264	8/6/2019	Yes	Power Point	X	X		X										
15	Habitat Condition Assessment Meeting Webinar	266-283	8/8/2019	Yes	Power Point	X	X	X	X	X					X				
16	USACE - 408 Coordination Meeting	285-298	8/14/2019	Yes	Impact Sketches	X													
17	JPA Page-Turn Meeting	300-338	8/20/2019	Yes	Power Point	X	X	X		X					X				
18	JPA Page-Turn Meeting	338-364	8/28/219	Yes	Power Point	X													
19	Virginia Harbor Safety Committee Meeting	366-378	9/17/2019	Yes	Power Point												X		
20	USCG Meeting	380-409	9/18/2019	Yes	Power Point								X						
21	USACE – 408 Coordination Meeting	411-428	9/19/2019	Yes	Power Point	X													

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22	JPA USACE – Update Meeting	430-441	10/01/2019	Yes	Power Point	X	X	X	X	X	X				X				
23	Section 408 – Virginia Maritime Stakeholder Meeting	443-473	10/17/2019	Yes	Power Point	X		X					X						Norfolk Hampton VA Pilots
24	VRMC JPA Mitigation Workshop	475-508	11/06/2019	Yes	Power Point	X	X	X	X	X	X				X			X	
25	Section 408 Maritime Stakeholders Meeting	510-539	11/14/2019	Yes	Power Point	X		X				X	X			X			Norfolk Hampton VA Pilots
27	Section 408 Maritime Stakeholders Meeting	541	12/09/2019	Information under development															
29	JPA USACE – Update Meeting	543-560	12/11/2019	Not Avail.	Power Point	Information under development													

Table Q-3: Table of Official Correspondence

#	Agency Letter / Email Attachment Q-	Pages	To	Subject	Main Factors
1	Commonwealth of Virginia Department of Conservation and Recreation 10/24/2019	**2 -3**	USACE	NAO-1994-1166, HRBT Biotics Data System Review	There are no State Natural Area Preserves under DCR's jurisdiction in the Project vicinity
2	Commonwealth of Virginia Marine Resources Commission 10/25/2019	**5-6**	HRCP	VMRC #19-1577	Letter notifying HRCP that a permit will be required by the Marine Resource Commission for the Project.
3	Hampton Roads Connector Partners 11/1/2019	**8 - 9**	VDEQ	Response to DEQ Request for Additional Information #1	Additional information requested for SCC partner joint venture, marine boring information, fee requirements, wetland buffers, and Property Access Agreement.
4	Commonwealth of Virginia Department of Environmental Quality 11/5/2019	**11 - 62**	HRCP	Federal Consistency Certification: I-64 HRBT Project, Cities of Norfolk and Hampton, USACE individual Permit (DEQ 19-093F) (CZM)	Letter noting that the document has been submitted to the following agencies: • Department of Environmental Quality (DEQ) • Department of Game and Inland Fisheries (DGIF) • Department of Conservation and Recreation (DCR) • Department of Health (VDH) • Department of Historic Resources (DHR) • Virginia Institute of Marine Sciences (VIMS) • Marine Resource Commission (VMRC or Commission) • Hampton Roads PDC • Crater PDC
5	US Coast Guard 11/5/2019	**64 - 66**	FHWA	HRBT – Permit Requirements on Oastes / Mason Creeks	Coast Guard review of Coast Guard bridge permit exemption. No permit is required by the Coast Guard for the following bridges: Bridge across Oastes Creek / Bridge across Mason Creek
6	USACE – Email 11/12/2019	**68**	HRCP	Spreadsheet of Comments on JPA	Comment spreadsheet to be addresses as part of JPA – Revision 1 Submission

ATTACHMENT Q-1 STAKEHOLDER MEETINGS AND PRESENTATIONS

HRBT Agency Meeting – August 10, 2018

Minutes of Meeting

In attendance:

Jim Utterback VDOT
Martha Gross VDOT
Scott Smizik VDOT
David Field MM
Doug Gaffney MM
John Duschang HDR
Nancy Connor HDR
Marcie Aydelotte HDR
Olivier Bonnot Vinci
Antoine Vitte Vinci
Solene Vazelle Vinci
Bob Kerr Kerr Environmental
Igor Zikus Dragados USA
Wissam Akra Dragados USA
Randy Owen VMRC
Allison Norris VMRC
Lauren Pudvah VMRC
George Janek USACE
Stephen Powell USACE
Larissa Ambrose VDEQ
Janet Weyland VDEQ
Craig Nichol VDEQ
Dave O'Brien NOAA (last 10 minutes)

1. Introductions

Jim Utterback outlined the purpose of the meeting. Open for HRCP to ask questions with 10 minutes reserved at the end for Agency comments. All attendees introduced themselves.

2. HRCP Questions

1. D. Gaffney asked the first question which was intended to open the conversation up to a variety of species which could potentially have Time of Year restrictions (TOY) on construction. Mr. Gaffney stated that we are moving forward assuming no TOY for Sturgeon based on the newly released sturgeon study. Will avoidance and minimization be sufficient to avoid TOYs for sturgeon, hard clams and submerged aquatic vegetation (SAV). R. Owen (VMRC) stated that he does anticipate TOY restrictions on anadromous fishes. When D. O'Brien came in at the end of the meeting, he stated that unless the construction area is a known sturgeon congregation area, TOY restrictions will be difficult to use as a protective measure. NOAA will implement Reasonable and Prudent Measures (RPM) through informal consultation.
    a. R. Owen said that the previous hard clam study was in 2002. Since oysters and clams strike on clean substrate between May and September, a restriction to turbidity producing activities (dredging, etc.) could be considered. Mr. Owen stated that the James River was a shellfish "haven" and that mitigation has been 1.3 to 1 for clam takes.
    b. R. Owen felt a TOYR for SAVs would be required if impacts to their environment were proposed. Both VIMS and DGIF (Dept. of Game and Inland Fish) have been very strong proponents of TOY restrictions for clams for this project (approx. May to Sept).
    c. R. Owen mentioned that a meeting of the resource agencies including VIMS had recently taken place. There was considerable debate about the use of, and impacts to, resident fishes due to pile driving hollow steel piles.

2. B. Kerr asked if the USACE could carve out commonwealth mitigation for species such as clams and SAVs from the Federal mitigation rule. G. Janek stated that the Corps will look to avoid and minimize first, then mitigate. They are bound by the 12 requirements of the Federal Mitigation rule, and even though VMRC does not have a similar program, the mitigation will need to comply for the USACE to recognize the mitigation. The USACE will be as flexible as they can be when dealing with impacts other than wetlands (very little flexibility for wetland mitigation). Regarding SAV and clam impact, both these habitats are part of Essential Fish Habitat, and therefore NOAA will be involved in the mitigation for these habitats with the USACE. Begin coordination on this topic early in the permit application process to give time to resolve the issues.
3. G. Janek asked if we were planning to use offshore dredged material disposal, and if so, we needed to get started on Section 103 permitting quickly. D. Gaffney said it was unlikely due to the low volumes of DM that are anticipated. J. Utterback stated that Immersed Tube Tunnel is no longer on the table. Both HRBT teams will be adopting bored tunnel technology. Jim mentioned that ITT would have required disposal of 4 million cubic yards *(post meeting note: the FEIS and Supplemental EA states 1.2 million cubic yards which we knew was incorrect)*.
    a. Section 103 Ocean Disposal is off the table for material with TBM additives
    b. Beneficial Use Determination (BUD) not eligible for material with TBM additives placed in locations with wetland/ water pathways
4. L. Ambrose (VDEQ) stated that we need to look at beneficial use of dredged material, particularly clean sandy material for beach nourishment first. R. Owen agreed and said that if sand, there was a mandate that the material be put on beaches. Localities must have their beach nourishment permits in-place to receive sands.
5. L. Ambrose (DEQ) indicated that TBM bored material should be evaluated using traditional disposal methods, and will depend on additives used.
6. The HRPC team suggested initiating TSA (Section 7) consultation with indicative level of design prior to the bid. J. Utterback stated that it was unlikely that they would do that due to confidentiality issues. He said that consultation might be able to commence once the procurement phase starts, or if a topic of particular concern comes up.
7. D. Gaffney stated that we understand that we will need a NWP6 for supplemental borings. Will we also need a submerged lands permit from VMRC? R. Owens said yes. D. Gaffney asked if there been any recent changes to the manner in which Section 408 concurrence is determined? S. Powell (USACE) stated that the Corps has a draft Engineering Circular that will more formally codify 408. Once adopted, there will likely be timing requirements for submittals and reviews.
8. The HCRP Environmental team brought up several questions pertaining to mitigation. It was noted that the project is located in two HUC codes. Mitigation credits can come from different river basins, if necessary. Approval for out of River Basin credit usage will be through the Interagency Review Team (IRT) and require both DEQ and USACE approvals (Sarah Woodford is the DEQs point of contact). The simplest procedure for compensation for wetland impacts will be credits if sufficient numbers are available. Stormwater credits will also be required. G. Janek stated that the Corps is flexible with respect to “out of kind” mitigation, but will need to look at specifics and will be up to the applicant to document the compensation makes sense from ecological perspective.

9. D. Gaffney asked if VMRC will require royalties on the volume of material bored and/or dredged? R. Owen said no, VDOT is exempt.
10. B. Kerr asked VMRC to verify that as a VDOT D/B project, it is exempt from Local Wetland Board permitting. Mr. Owens agreed that it is, but those resources (tidal wetlands and tidal shores) are regulated by VMRC instead.
11. B. Kerr asked VDEQ about Shading impacts and conversion. L. Ambrose said that she will send the equation that VDEQ uses to determine the shading conversion over vegetated wetlands.

3. Agency Comments

J. Utterback asked the agencies for any final thoughts.

1. J. Utterback asked to confirm that work in uplands could proceed prior to secure permits to work in wetlands and waters. G. Janek confirmed this is lawful, as did R. Owens from VMRC. Larissa Ambrose and Janet Wayland (DEQ) indicated that E&S, stormwater and VSMP General Permit approvals are needed for any staging areas, laydown areas and areas where land disturbance occurs.
2. L. Ambrose and J. Wayland (VDEQ) stated that they would like to see chemical testing early to help determine which beneficial uses are possible. There is a time limitation on holding material that is slated for beneficial use since its properties may change over time. They mentioned two guidance documents will be applicable: Dredged Material Guidance Document, and Beneficial Use Document. A beneficial use determination will be required from the Solid Waste Division.
    a. J. Wayland indicated a VPDES permit will be required for any point source discharge of process waters such as from a water treatment facility. DEQ will require proof that HRSD cannot receive such process waters before reviewing a VPDES point source permit application.
    b. C. Nichol indicated that the applicant should not expect anything less stringent than the Parallel Thimble Shoals Tunnel project. Agency encourages pre-application meetings and early VIMS involvement.
3. S. Powell noted that the Corps does not want any contaminants to enter the navigation channel that might cause dredging problems in the future. USACE also concerned about ability to continue future maintenance activities above the tunnel (e.g., cutterhead dredging, no-spud zones).
4. VMRC noted that there may be TOY restrictions placed on hollow steel piles. It was recommended that we meet with DGIF and VIMS to discuss impacts to resident fishes.
5. G. Janek (USACE) indicated that the schedule was ambitious and that a pre-application meeting will be very important.

Hampton Roads Bridge Tunnel (HRBT)
Agency Conference Calls Summary

Conference Call - September 26, 2018

Attendees
U.S. Army Corps of Engineers (USACE) - George Janek
Virginia Department of Environmental Quality (VDEQ) - Larissa Ambrose / Jeff Hannah
Virginia Marine Resources Commission (VMRC) - Allison Norris
National Marine Fisheries Service (NMFS) – Dave O'Brien (follow-up conversation)
Virginia Institute of Marine Science (VIMS) – Emily Hein
VDOT - Scott Smizik
Stantec - Brian Hawley / Carolyn Keeler

Discussion Points

Jet Grouting / Island Extension
At this time, there are no specifics regarding the design for the HRBT project. However, based on the preliminary geotechnical investigation, substrate unsuitable to support the tunnel boring machine (TBM) is present under and north of the South island. Based on known experiences at the Chesapeake Bay Bridge Tunnel (CBBT) and other similar projects, jet grouting is an option that could be used to increase soil strength and rigidity necessary to support the TBM maintaining desired alignment and slope.

VDEQ
The Design-Builder (DB) for the CBBT project is proposing jet grouting in-water and on the portal islands. The VWP program is not involved with the in-island work. In-water jet grouting is being conducted from a trestle. Jet grouting has not yet been completed in-water, but a test hole was conducted in-island. The process has raised DEQ's concerns on the in-water jet grouting regarding water quality.
Concerns for in-water jet grouting has led to:

- As part of the JPA review, DEQ has required documentation on how the DB will control / contain the jet grout residual for the entire process.
- The DB has a dedicated person on the trestle to monitor containment the entire time jet grouting is being conducted.
- DEQ has required a jet grout spill and prevention control plan. This plan includes, in part:
    - A dedicated individual shall continually monitor the on-trestle jet grout residual storage tank to monitor the level of jet grout residual and to shut down the operation if any mechanical system fails.
    - At no time shall the on-trestle storage tank be more than 75% full.
    - The on-trestle storage tank shall be placed within a secondary spill containment pan.
    - The waste line carrying the jet grout residual from the on-trestle storage tank to the on-island muck bin shall be fully encased in a sleeve pipe that will serve as protection and secondary containment.
- The DB methods includes a separate casing around the jet grout system. Jet grout will flow up the casing into a storage contained on the trestle. There should be no interface with water.
- The separation of the waste streams (including jet grout) will depend upon the selected disposal facility. The disposal facility can take the jet grout material but not the tunnel boring material or

may be able to take both. Be prepared for the possibility that the materials will be disposed of at different locations. If you do use different disposal locations for the different materials, you'll need to show how the materials will be kept separate from each other from the point of generation to the point of disposal. For example, if you need to dispose of the jet grout material and the tunnel boring material at different locations *and* you will be generating both of these materials at the same time on your project site, you'll likely need separate on-site storage bins for the material to ensure that the material goes to the appropriate disposal facility.

- Need to provide agencies the specific details on the components and characteristics of the grout materials (also noted by the USACE).
- Demonstrate that either expansion or jet grouting are required for the project purpose. Show full avoidance and minimization efforts in the JPA. (also noted by the USACE).
- Water quality monitoring will be required based on project specifics. The need for a water quality morning plan cannot be determined at this time. At this time for projects with jet grouting, DEQ is not requiring a water quality monitoring plan specific to jet grouting. However, DEQ may make the determination that monitoring is required if jet grouting for other projects (or as this project progresses) causes water quality issues.

USACE

The USACE shares many of the same concerns as VDEQ (see above). It is not appropriate for the JPA to indicate that currents will dilute any grout material (ex, high pH levels). The USACE wants demonstrated containment and detailed description of disposal. For the CBBT, containment was increased through the use of higher sheet piling on the engineered berms. The CBBT JPA also included a detailed method for flushing equipment and wastewater containment to avoid wash water from entering US waters. The JPA included the decant mechanism for the process.

Contaminants settling to the channel bed could jeopardize the USACE use of the Norfolk Ocean Disposal Site (NODS) for future maintenance practices. Nothing that the DB does or discharges will contaminate or adulterate sediments such that the Corps can't use NODS for future channel maintenance and deepening. This applies to any type of discharge, i.e. jet grout residuals, decant water, effluent from tunnel boring operations, whether authorized by the Corps or DEQ through its VPDES program.

For the CBBT project, the JPA included the discussion that the use of jet grouting reduced the island footprint. This point added to the avoidance and minimization discussion. If both expansion and jet grouting are required, demonstrate the need for both practices.

VDOT

The NEPA documents assumed islands would be widened to the west. It is understood that in order to accommodate the grades that FHWA/VDOT will require, it is anticipated that the islands will be extended landward to provide the TBM with space to get down to the necessary depth while maintaining grade. It is assumed that such an alignment would result in less bottomland impact than estimated in the SEIS or EA Re-evaluation documents. In addition to this conversation, VDOT will be discussing these high-level concepts with the State Historic Preservation Office (SHPO) to gain any insight as to how these changes would be viewed under Section 106 of the National Historic Preservation Act.

- USACE – In terms of Section 408, widening landward is preferable to channel ward. This may also result in fill slopes / impacts. However, this may result in additional impacts to shallow water (depths less than 2 m/6.6 ft) / SAV / oysters / EFH concerns. These resources may be considered a different or higher value than bottomlands by different agencies. The JPA must

include detailed avoidance and minimization efforts discussing why these impacts are necessary. For discussions with the SHPO, be certain to also discuss viewsheds.

Shallow Water Habitat Impacts

USACE

For all impacts to shallow waters, JPA should include specific avoidance and minimization efforts. The USACE has typically required compensation to shallow water subaqueous bed impacts. As part of the overall review for compensatory mitigation, the USACE will need to consider (and obtain input from other agencies) on the value of the areas in terms of EFH, SAV, oysters, etc.

NMFS

Based on previous projects, the agency will focus on the loss of habitat. Conversions are not necessarily a loss of habitat. While habitat conversion must be considered, NMFS has recommended USACE include compensation for habitat loss. NMFS also will be interested in the change in depths of shallow waters. The intensity of conversion is measured, in part, on the change in depth. CBBT achieved a great deal of avoidance of habitat loss during the permitting process and similar efforts will be expected at HRBT.

Beneficial Use

VDOT has reached out to the Hampton Roads PDC for potential beneficial use projects. They have informally responded that there are no shovel ready projects and there are no known projects projected in the next seven years. Is additional coordination required as part of the permitting process?

VMRC (responded via email)

VMRC will require additional research for projects on public beaches to place the beneficial uses material. The City of Norfolk has potential projects that could use the material, and the City of Hampton may also use some. Suggest reaching out to those two cities to discuss further with them how they can use the material.

Conference Call - October 4, 2018

Attendees

USACE - George Janek
VDEQ - Larissa Ambrose
VMRC – Randy Owen / Allison Norris
NMFS – Dave O'Brien
VDOT – Scott Smizik
Stantec - Brian Hawley / Carolyn Keeler

Discussion Points

Test Pile Driving Activities

As the design has not yet been finalized, the location, number of, size, material, and additional details for test pile driving are not known. However, test pile driving is anticipated in both the small river systems and the main stem near the location of the existing bridge-tunnel.

All agencies agreed that the final recommendations cannot be provided until the construction means and methods are known but they have offered the following comments.

USACE
Test piling may be done under a Nationwide Permit (NWP) 6. However, a NWP 6 can only be used for temporary impacts. If the pile is removed 3 feet below the mud line, it may be considered temporary. USACE would need to discuss if this practice would be considered a permanent or temporary impact. Details on if the piles can be vibrated in or out of the subsurface would inform this decision. This issue should be discussed further with the USACE. Anything other than full removal could result in a navigational hazard or inhibit the future dredging of the federal navigation channel.

Section 408 will be an issue and will need to be resolved with the Operations Branch. Section 408 will be required even if the pile driving is completed outside of the Federal Navigation Channel, as USACE considers Section 408 from "bank to bank".

Although sturgeon are transient through this area, the agency will require a thorough review of how impacts to sturgeon and other anadromous fish will be avoided and minimized. Encased bubble curtains, soft start procedures, cushion blocks are being used at CBBT and may be appropriate for the HRBT project.

NMFS
Agreed with USACE comments. Need to understand the number, diameter and composition of proposed piles. Will also consider the time of year that the test piling is being completed and the potential impact to sturgeon (see results of sturgeon study). The DB will need to provide information on the noise levels and the zone of ensonification. Same resource concerns for test piles as production piles.

DEQ
DEQ's permitting will be dependent on the issuance of the USACE permit. If a NWP 6 is issued, a DEQ permit will not be required.

VMRC
Agree with USACE and NMFS comments. Will seek guidance from VIMS (including Dr. Tuckey) and DGIF.

If the piles are not extracted, agency will have concern on how to avoid boat strikes.

Defer to the USCG on pile driving and navigational impact study. Should have USCG involved regarding this issue (agreed by USACE).

Additional Geotechnical Work
VDOT asked about obtaining the same NWP 6 for both pile driving and additional geotechnical work.

USACE
Operations Branch will likely see this as two separate activities and actions. Suggest having these activities as separate NWPs.

Hydrodynamic Modeling

Hydrodynamic modeling was completed as part of the NEPA process. As noted in the September 26th conference call, island expansion may be required. What are the concerns regarding this work. Will VIMS be required to revisit the model and what are the limits to determine when the additional modeling is required?

VMRC
Suggest having VIMS answer this directly as additional modeling may be required. Randy will discuss this issue with VIMS.

USACE
Change in hydrodynamics is a public interest review factor. Will need to see the VIMS determination in writing.

One Hampton landowner is concerned that additional flooding on the property (100-year flood plain) will result from the new bridge / tunnel structure. They have sent letters to FHWA as part of the NEPA process. Lyle Varnell (VIMS) commented that they cannot comment at NEPA level because they do not have the appropriate data. The DB needs to confirm that the project will neither affect the 100-year flood plain as a result of the project nor cause additional flooding to local properties.

VDOT / VIMS / VMRC Clarification Call – October 19, 2018
A discussion was held to better understand what potential island expansion activities justify the need for additional hydrodynamic modeling. VIMS / VMRC cited two primary factors that dictate the potential need for additional modeling: the percentage increase in island expansion footprint relative to the water body cross-section and water depth. The larger the percentage of increase and blockage to the cross-section, the greater likelihood additional modeling would be required, therefore VIMS recommended the least amount of island expansion. Blockage resulting from island expansion in shallow water (landward) is not as concerning as deeper water impacts channelward. There is concern regarding the north island expansion since this is proximal to and could affect residence time in the Mill Creek area that showed the most effect in the initial modeling results. Shape of the island expansion is not considered a factor in the decision to re-model. Modeling will not be pursued at this time but may be requested by VDOT at a later date. Otherwise this will become the responsibility of the selected DB team. Given the needed design information, VIMS believes the re-modeling can be performed within a weeks' time, and a summary of the resulting changes to the previous report, provided shortly thereafter.

Meeting Summary

Date: January 25, 2019

Subject: HRBT Expansion Project – Section 408 Stakeholder Coordination for Marine Geotechnical Investigations

RE: Coordination Meeting

A coordination meeting with navigation stakeholders, HRBT proposer teams, regulatory agencies and Virginia Department of Transportation (VDOT) representatives was held on Friday, January 25, 2019 at the VDOT Hampton Roads Bridge Tunnel (HRBT) Project Office in Norfolk to update stakeholders on the current project schedule and discuss offshore geotechnical investigation to be conducted by the selected design-build team (DBT) after project award within the Hampton Roads marine environment and federal navigation areas. A sign-in sheet and presentation that was used to guide the conversation is attached to this meeting summary.

Opening Remarks

Following general introductions, Jim Utterback, the VDOT Project Director, provided opening remarks regarding the project. The general purpose of the meeting was to engage maritime stakeholders in advance of selection of the DBT, begin a process of collaboration and open communication in support of both short- and long-term critical path planning for Section 408 clearance for potential geotechnical investigation early works by the selected DBT, provide a forum for stakeholder comments to proposer questions, and share information since the coordination meeting for VDOT's preliminary geotechnical investigations was held in May of 2017.

Project Overview and Status Update

Scott Smizik, VDOT Environmental, reviewed the initial slides in the attached presentation, providing a more detailed discussion on the purpose of the meeting, progress since the previous May 2017 meeting, and anticipated next steps.

- Scott started with a brief overview of the schedule of activities that have occurred to date. Specifically FHWA issuance of a Record of Decision, additional environmental studies, USACE permit for VDOT geotechnical work, the proposers' commitment to a bored tunnel approach.

- Scott also presented the projected next steps of the schedule. The anticipated future timeline is as follows:
    - Identify selected DBT- February 2019
    - Contract Award - April 2019
    - Scope Validation - 2019
    - Project complete- 2025
- Scott discussed in more detail scope validation, and it's importance to the stakeholders. Scope validation is the period within the first 6 months of contract award that allows for the selected DBT to collect and verify project data. This may include geotechnical work along the project corridor. Until a DBT is awarded the contract, VDOT will not know the extent of the geotechnical investigations the selected DBT may choose to conduct. Therefore, for the purpose of this meeting, VDOT will assume geotechnical work will occur along the entire corridor and will present material similar to what was performed in 2017 during its own geotechnical investigations. While the exact location, type, and timing of the future geotechnical investigations may change, the goal of the meeting is to solicit input from the navigation stakeholders based on these anticipated activities to inform the Operations Plan the selected DBT would submit as part of a permit application for geotechnical work. Scott noted the stakeholders could indicate there had been no change in their requirements since 2017 or they could highlight changes in conditions for the DBT's incorporation into the Operations Plan.
- To inform this discussion, Scott summarized what VDOT had heard from past scoping and meetings with agencies and navigation stakeholders regarding the area being evaluated under Section 408. This included concerns about working in or around the federal navigation channel that passes over the tunnel, working near Anchorage Berth F-1, type and frequency of navigation traffic to consider, and expectations for working in the channel and emergency operations for clearing the area. He noted that the information developed to support VDOT's 2017 permit application, as well as the permit documents, had been provided to both proposers to allow them to understand what documentation is expected.
    - LCDR Peter Francisco (U.S. Coast Guard/Sector Hampton Roads) stated the busiest times for military activity in the channel are constantly in flux, even more so from the commercial side, so it should not be assumed that Monday morning and Friday afternoons are the only primary of heavy traffic.
    - Whiting Chisman (Virginia Pilots Association) clarified that Anchorage F does not typically receive 24 hour notice when its use is requested by vessels.

- There were not additional questions or comments related to the background information.

Scott then provided an overview of the project termini, specific improvements along the project corridor and key project segments including the tunnel crossing and its specifics, island improvements, marine bridges and landside highway widening. Procurement milestones were presented including the anticipated DBT's marine geotechnical investigation during the scope-validation effort.

Marine Geotechnical Investigations

Martha Gross, VDOT Deputy Project Director, provided a summary of VDOTs 2017 marine geotechnical investigation as an example of the work that may be performed in order to elicit questions from both stakeholders and proposers and inform the DBT's Operation Plan with regard to Section 408. It was emphasized that the information presented at the meeting was not meant to represent either proposer's specific plans, but was indicative of the types and locations of anticipated future geotechnical work that will be conducted by the selected DBT. The anticipated area along which the work would be performed, including navigational channel and anchorage mapping, was also presented.

Potential means, methods, and timeframes for the work were discussed. The DBT could use marine vessels such as a jack-up barge or spud barge to perform soil borings, cone penetrometer tests (CPTs), and related types of geotechnical sampling and testing. These tests may be conducted anywhere along the alignment of the new bridge-tunnel. In VDOT's experience, a typical boring could take approximately 24 hours at one location and a CPT test approximately 2-3 hours at one location. During its preliminary geotechnical program in 2017-18, VDOT kept a standby dive crew on the drill rig for all investigations within the navigable channel. This was in order to meet the stakeholders' requirement to clear the channel within 30 minutes in case of emergency, even if that meant having the divers cut a drill casing or barge spud underwater. The dive team was also able to help verify that unrecovered casing pipes during this operation were not impacting the navigation channel.

Q&A / Agency Inputs

Scott Smizik -Mentioned that in 2017 there was some focus on the time of year this work would take place. Based on a schedule that calls for contract award in April 2019, it is anticipated that the selected DBT's geotechnical work in marine environments could occur in the later part of 2019.

Frank Perrone (HRCP/MM) – Noting his proposer team's experience at the Chesapeake Bay Bridge Tunnel (CBBT) project, he understood that there could be different rules in auxiliary channels and requested to clarify requirements for diver support in the actual navigation channel, Norfolk Harbor Entrance Reach, and shore to shore, as well as effects of Standard Operating Procedures on operations. He was advised that there are no auxiliary channels around the HRBT, as at CBBT;

but outside the channel it would not be necessary to have divers on standby to support emergency evacuation, as ships would run aground in shallower water. It also was noted that the entire navigation channel can be used to support approaches to Anchorage F.

LCDR Peter Francisco (USCG/Sector Hampton Roads) –Even when planning for emergency evaluation of the channel, it is not necessary to move for each ship passage because the channel is very wide. In many cases, the ship and the Coast Guard would work with the geotechnical team to accommodate both vessels in the channel. It would be necessary to evacuate the channel though, when any large Navy ship needed to pass by.

George Janek (USACE Regulatory) – Should the federal government shutdown continue, he cannot coordinate with federal partners (National Marine Fisheries Service, Fish and Wildlife Service, etc.) or predict their workload delays that may result from shutdown. USACE would not be able to issue a permit (e.g. Nationwide 6) for the geotechnical investigations without this coordination. (Note: An announcement was made later on January 25 that the federal government would reopen on January 29, 2019.)

LCDR Peter Francisco (USCG/Sector Hampton Roads) – Navy safety and bridge permitting is suspended during shut down as well.

Steven Powell (USAC Operations) – Advised of a new Engineering Circular on the Section 408 process: no longer covers solely bank to bank but all potential impacts to projects including initiatives being studied. Project needs to consider both Hampton River and Willoughby Channels, as well as approaches to Anchorage F. Anchorage F is approved for a larger diameter and depth: design just underway, anticipate a 2-year effort to complete. This needs to be considered in the DBT's planning. The timeline for the design work could be accelerated by the Port of Virginia, USACE's cost share partner for the project.

Meeting Summary

Project: I-64 Hampton Roads Bridge-Tunnel Expansion **Project No.:** 0064-M06-032

Client: VDOT

Meeting Title:	HRBT Expansion Project – Periodic Resource Agency Meeting
Date:	March 27, 2019
Time:	9:00
Location:	VDOT Norfolk Offices

Attendees:

Name	Initial	Affiliation	Phone	email address
Jeff Hannah	JH	DEQ	(757) 518-2146	jeffrey.hannah@deq.virginia.gov
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David Barrier	DB	HRCP	(514) 663-9198	david.barrier@vinci-construction.com
Igor Zikus	IZ	HRCP	(571) 485-0927	izikus@dragados-usa.com
Brian Hawley	BH	Stantec	(540) 908-5528	brian.hawley@stantec.com
George Janek	GJ	USACE	(757) 201-7135	george.a.janek@usace.army.mil
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Paula Miller	PM	VDOT	(757) 619-4163	paula.miller@vdot.virginia.gov
Kim Blossom	KB	VHB	(757) 509-0736	kblossom@vhb.com

Meeting Summary

Meeting Notes:

No.	Description	Action
1	**Update and Project Status**	
	Introduction by SS (VDOT). This meeting is a continuation of meetings carried out at the pre-bid stage, which included a wider range of stakeholders. A separate meeting will also be held on Section 408 for navigation issues (tentatively scheduled for week of April 15). GJ (USACE) asked for the meeting to be scheduled as early as possible. Other potential discipline specific meetings may include: - Section 106 meeting with Virginia Department of Historic Resources - SS (VDOT) will schedule a meeting to discuss Sturgeon report findings and recommendations. Dr Garmin (VCU) is due to release findings of report on Sturgeon activity in James River. Research indicates that prior year presence of juveniles was an anomaly. SS confirm that Benthic Study 2018 will be used as basis for the project (and be distributed by VDOT to the agencies).	VDOT/HRCP
1.2	DG (HRCP) provided an overview of the Project including supplemental borings for geotechnical and environmental investigations. Please refer to enclosed PowerPoint Presentation. JIMA (HRCP) proposed that we keep monthly meetings with the agencies prior to the JPA pre-app meeting.	
2	**Proposed schedule of meetings, permit applications and construction – HRCP**	
2.1	For in-water borings, DG (HRCP) inquired whether General Permit No. 1 and Submerged Lands permit would be applicable for the supplementary borings currently being planned. AL (VMRC) stated that the existing permit issued to VDOT could be modified.	
2.2	JW (DEQ) enquired about the timing of the Construction General Permit (CGP), and noted that if possible, HRCP could consider an earlier submission date, as Central Office usually requires more than one submission. JW suggested that the CGP application be submitted through the Tidewater Regional office of DEQ.	
2.3	JW (DEQ) recommended that a pre-app meeting be held for the VPDES permit for water treatment. LV (VIMS) suggested that a plume dispersion study may be needed for the VPDES permitting for treatment plant discharges. The mouth of the James River is a different environment (to Thimble Shoal) as there would be less dilution, and clam beds are present. JIMA (HRCP) stated that HRCP are starting the permitting early to adequately address these issues given that, per the contract, the design-builder is not allowed to rely on disposal of treated water through HRSD. Shellfish and water quality stakeholders to be consulted.	

Meeting Summary

No.	Description	Action
	GJ asked whether there would be warm water discharges from the water treatment plant (similar to Thimble Shoal). JIMA responded that HRCP was not certain yet. GJ reminded the HRCP team that chemical discharges cannot be allowed which could impact the future ability of the Corps to dredge the federal channel and place the material at an offshore location.	
2.4	USACE requested a copy of the environmental permitting schedule as soon as possible.	HRCP
3.0	**Compensatory Mitigation**	
3.1	HRCP – the Habitat Condition Assessment (HCA) will be based on existing data. Since a benthic survey was completed by VDOT in 2018, an additional benthic survey will not be required. LV (VIMS) acknowledged that this was reasonable. LV requested a copy of the existing benthic survey report. DG (HRCP) stated that the HCA would be part of the Avoidance, Minimization and Mitigation Plan (AMMP) which would identify those aspects of the project design that have sought to avoid and minimize environmental impacts. It was recommended that the HCA consider temporary impacts less than 1-year, extended impacts greater than 1 year, and permanent impacts.	VDOT
3.2	GJ (USACE) requested that a description/list of ways in which impacts have been reduced in our design should be provided, e.g.: - Minimal island footprint - 1 x 8 lane bridge vs 2 x4 lane - Trestle impacts (vs dredging) - Reduced effluent due to different TBM.	HRCP
3.3	DG stated that a lack of sub-aqueous bottom credits exists to compensate for loss, making mitigation difficult. GJ (USACE) - HRCP should include a proposal for mitigation in its permit application, as leaving this open-ended will take longer.	HRCP
3.4	NOAA may require mitigation for impacts to SAV, EFH, shellfish, sub-aqueous bottom, shallows (<2m water depth). The physical footprint of impacts may include shading and sediment resuspension into the area due to hydraulics and wave effects. Using the 5-year SAV database to determine SAV extent (vs. new survey) is acceptable to VMRC and VIMS. VMRC is presently codifying their existing policy for SAV mitigation. HRCP requested details on this policy. Post meeting note: AL (VMRC) (April 09, 2019 1:49 PM) "impacts to SAV will need to be compensated for based on the total area and percentage of SAV cover with an in-lieu fee or other mitigation plan deemed appropriate during the review process."	VMRC
3.5	Elizabeth River Restoration Trust is now selling mitigation credits for impacts to sub-aqueous bottom - this is outside the HUC (where impacts may occur) but may be accepted by the USACE as there is a shortage of available credits within the HUC.	

Meeting Summary

No.	Description	Action
3.6	AL (VMRC) identified hollow steel pilings as having significant impacts. Best Management Practices (BMPs) would be required.	
3.7	LV (VIMS) noted that the Habitat Condition Assessment (HCA) previously submitted for Thimble Shoal is 'footprint centric'. HRCP should include information on what is being done within the footprint, by what methods, and timing. In addition to direct impacts from footprint, other (site and species specific) impacts e.g. from sediment dispersion and wave dynamic energy should be considered. LV stated that if the changes to the footprints of the islands are “normal” to the flow (i.e. 90 degrees to the axis of the flow), then this change may require a re-model of the VIMS hydrodynamic model. SS stated that island footprint changes will be provide as soon as they are available. SS added that based on the bid design of the Island Expansion proposed by HRCP, it is not expected that the hydrodynamic model will need to be revisited prior to permit coordination with VMRC.	
3.8	JIMA (HRCP) - HRCP is considering using demolition material from the existing roadway trestles for beneficial uses in artificial reef. AL (VMRC) - VMRC is supportive of this approach.	
3.12	USACE inquired about the proximity of navigation channels. DG stated that the current design has at least an 80ft clearance from the Hampton Creek Approach Channel. Distances to all channels will be shown at Section 408 meeting in a few weeks.	
3.13	LV (VIMS) enquired whether TBM conditions would be the same as Thimble Shoal. JIMA clarified that to minimize impacts, HRBT will use a slurry based TBM system, which requires less additives. HRCP will also carry out bench-scale testing of new chemical additives as part of the JPA to characterize TBM materials for disposal. The TBM material will have less moisture content than Thimble Shoal.	
4	**Other Topics Raised During the Meeting**	
4.1	LV (VIMS) enquired whether barge access dredging would be used? JIMA (HRCP) are anticipating use of temporary trestles for shallow water construction.	
4.2	JW (DEQ) indicated concern for chemicals from the TBM additives in the water discharged via the VPDES permit. DG recommended that we do Whole Effluent Toxicity testing during the Bench Scale Testing and JW agreed that this was a good approach.	
4.3	DG (HRCP) – not currently planning Section 103 for marine disposal of materials.	
4.4	USACE – HRCP will need to assess capacity of disposal facilities and routing in DMMP. JIMA (HRCP) stated that this was accomplished during the bid phase.	
4.5	JH (VDEQ) – Tidal creeks. HRCP – Wetland delineations have been provided by USACE for the entire project corridor/footprint. No new delineations will be required.	

Meeting Summary

No.	Description	Action
4.6	Monthly meetings to be continued. Next meeting was tentatively set for April 24, 2019. Location TBD.	VDOT/HRCP

Hampton Roads Bridge-Tunnel

VDOT

ENVIRONMENTAL PERMITTING
MEETING WITH RESOURCE AGENCIES
March 27, 2019
9:00 – 11:00 AM

Hampton Roads Connector Partners

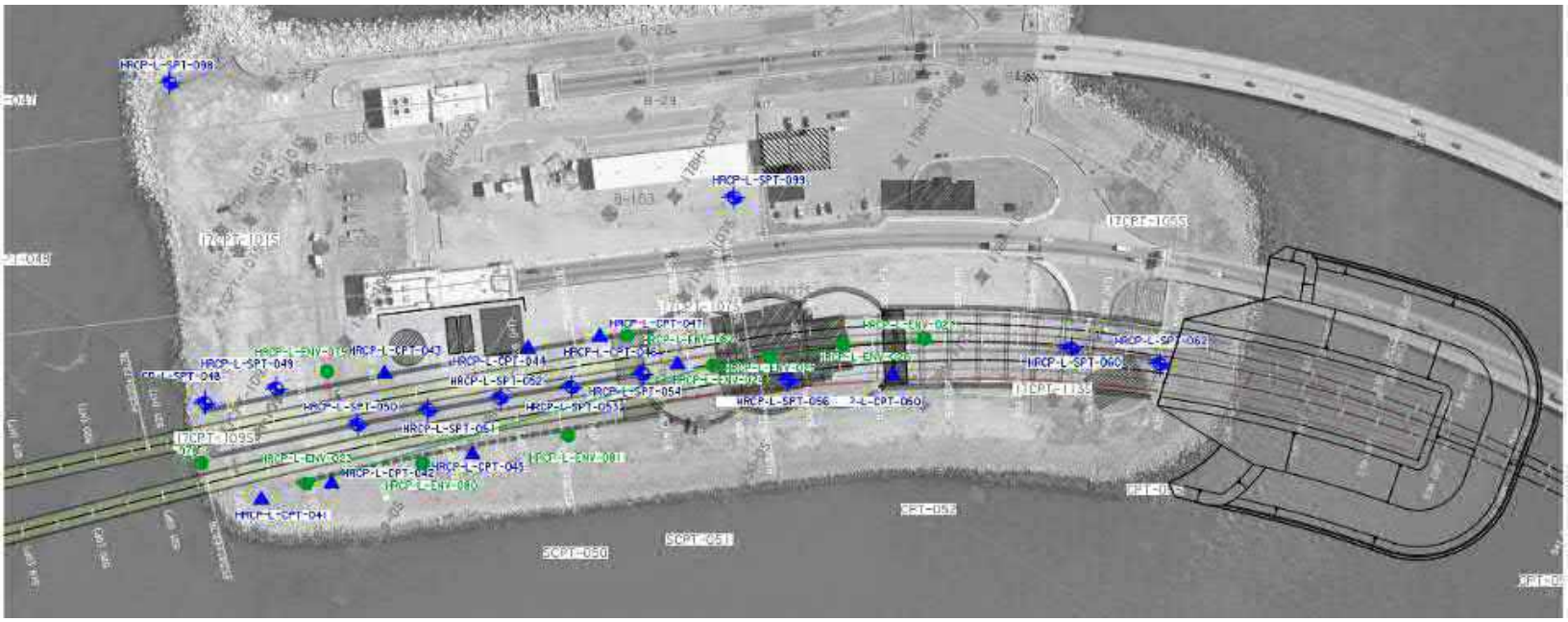
Agenda

- Update and Project Status – VDOT
- Proposed schedule of meetings, permit applications and construction – HRCP
- Compensatory Mitigation
- Joint Permit Application
- Other Discussion Points

Update and Project Status

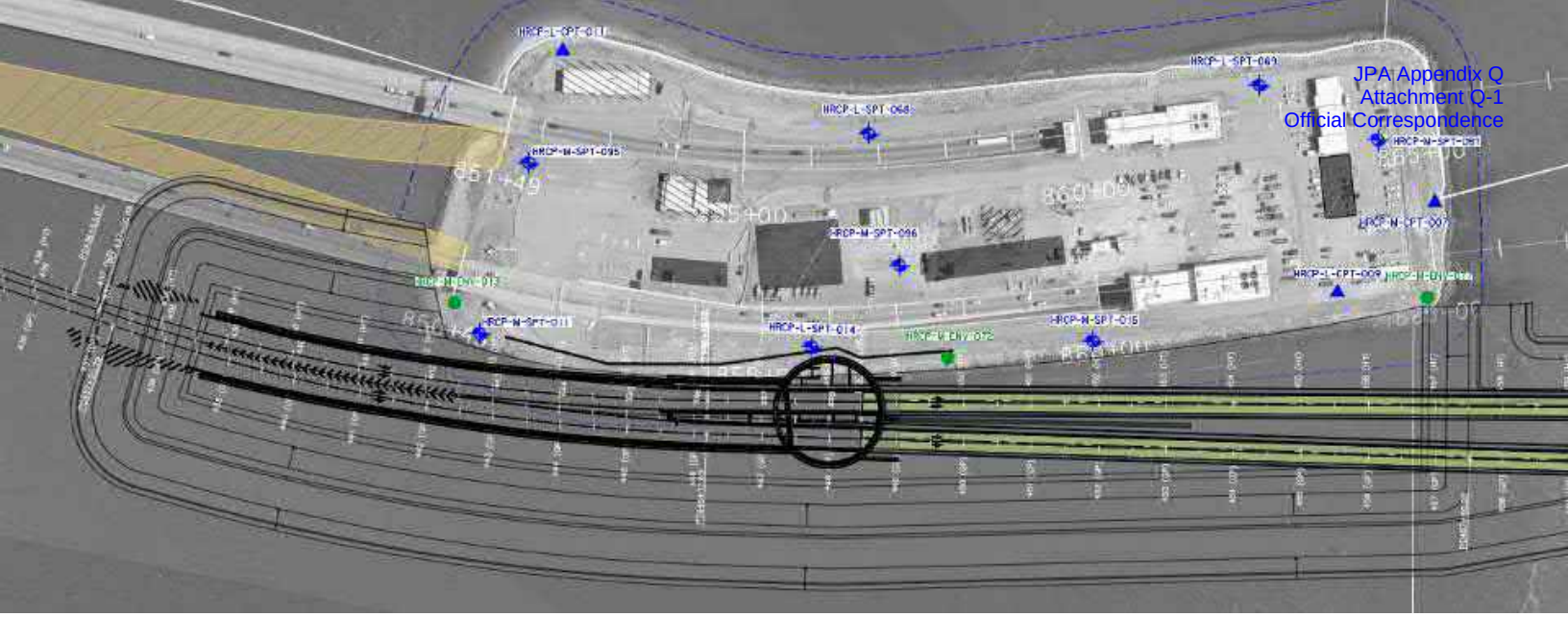
a. Overview of the Project

b. On-Island Supplemental Borings



South Island Boring Plan

Footprint of island expansion



North Island Boring Plan

Footprint of island expansion

Proposed schedule of meetings, permit applications, review and consultation period, and construction

Proposed schedule of meetings, permit applications, review and consultation period, and construction

- Section 408 Meeting for Supplemental Geotech. Investigation (S.I.) – Week of April 15
- NWP6, Submerged Tidelands application for S.I. – May 17
- Sturgeon Meeting – TBD
  - Other discipline-specific meets as required
- Pre-application JPA meeting – Week of June 24
- VPDES application – Week of August 23
- JPA Permit Application – Week of August 30
  - USACE Public Notice – September 2019
- Submit application of Construction General Permit and VSMP Week of Nov 6

Proposed schedule of meetings, permit applications, review and consultation period, and construction

- Agency Review of JPA – September 2019 →
  - Respond to RFI's
  - Discipline-specific meetings as necessary
  - Compensatory Mitigation Meetings
- NEPA Consultation – Section 7, EFH and Section 106
- Revise Environmental Assessment
- Coastal Zone Management Federal Consistency
- VMRC Commissioner's Hearing – March 2020
- VDEQ Draft Permit – March 2020
- USACE Draft Permit and Section 408 – April 2020

Proposed schedule of meetings, permit applications, review and consultation period, and construction

- Construction →
  - South Portal - June 2020
  - Roadway Trestles Oct 2020
  - Tunneling – February 2022
- Substantial Completion – September 2025

Compensatory Mitigation

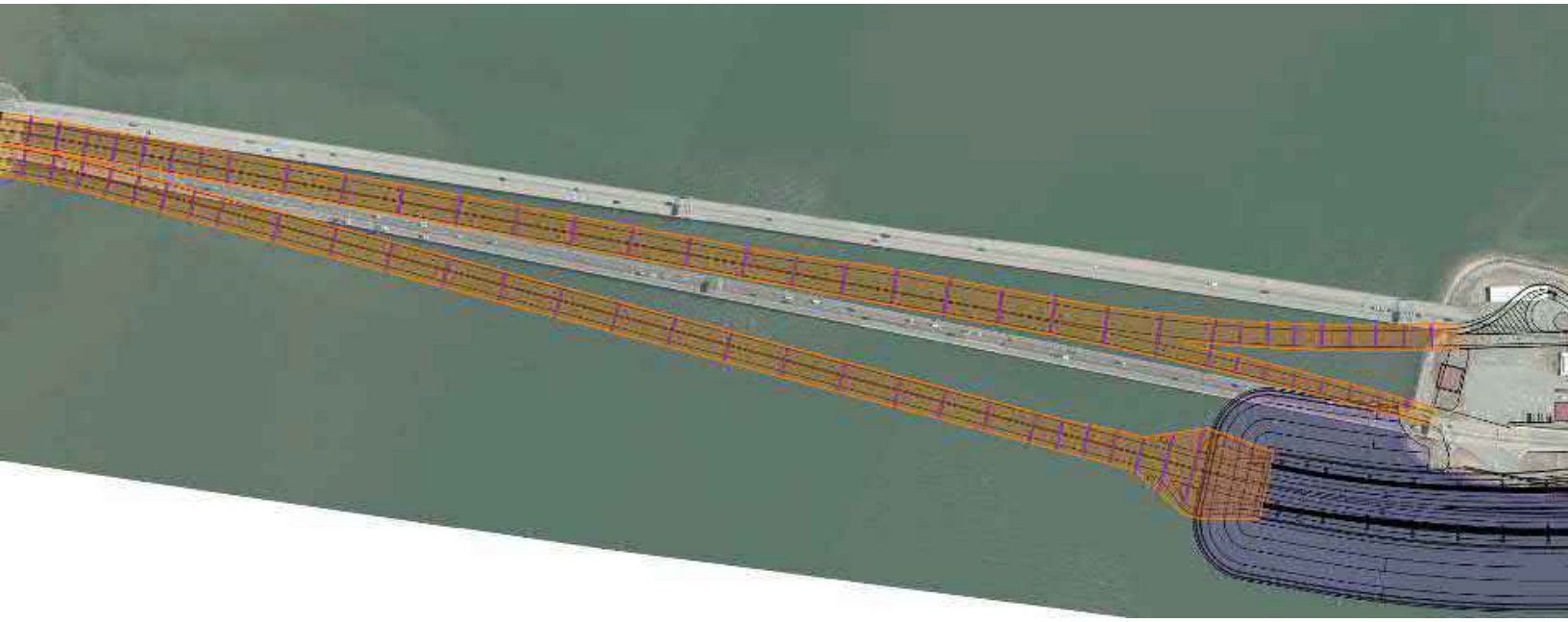
Compensatory Mitigation

- Habitat Condition Analysis (HCA)
  - Benthic Survey Completed in 2018
- Avoidance, Minimization and Mitigation Plan (AMMP)
- Agency perspectives on specific habitats
  - SAV
  - Subtidal bottom
- Meet with USACE, NOAA, and State to finalize Mitigation Plan
  - Deficit of available credits for subtidal bottom

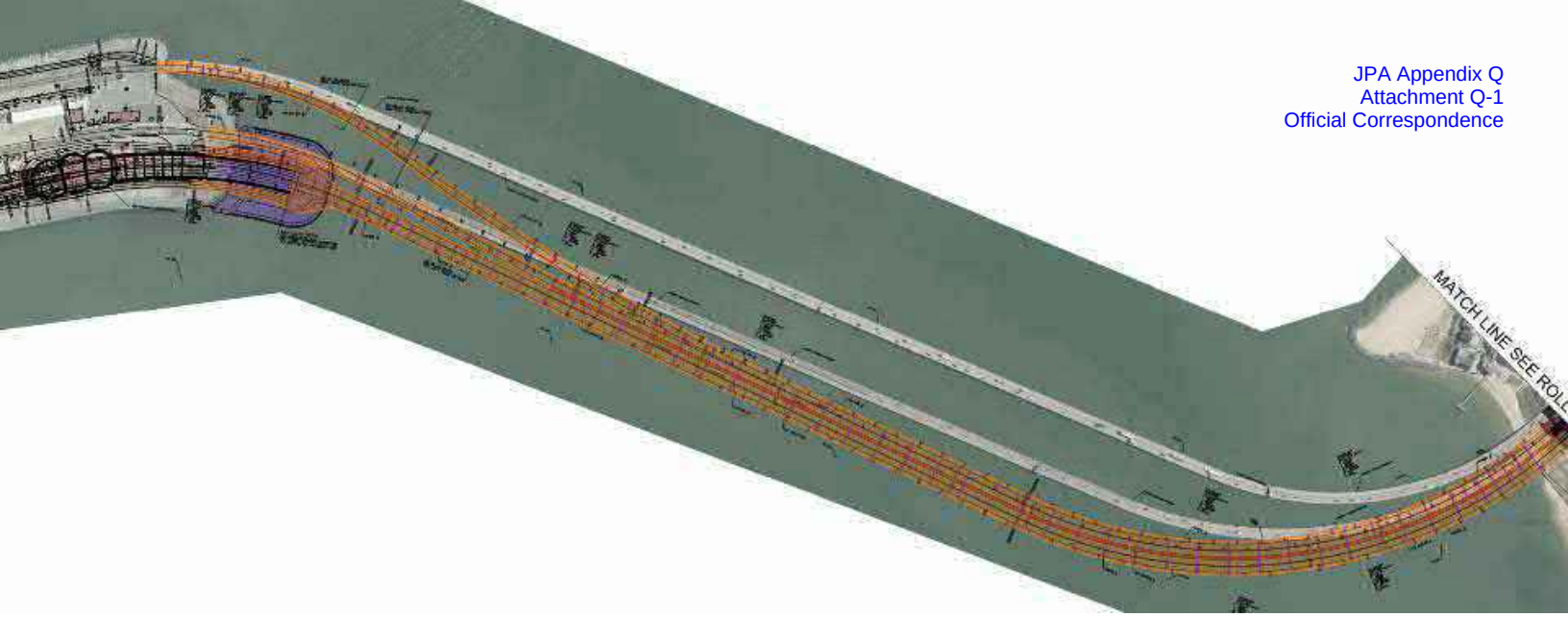
Joint Permit Application

Joint Permit Applications (JPA)

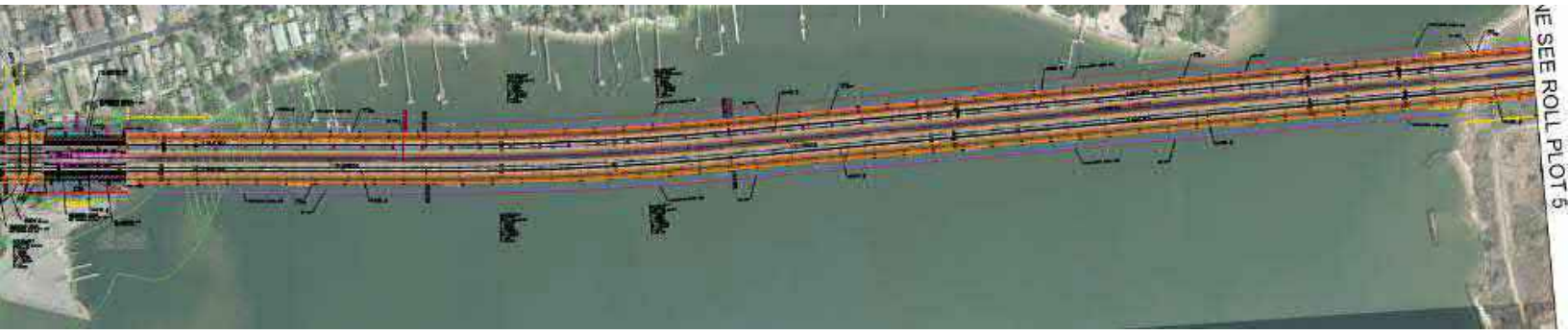
- Pre-Application Meeting – Late June 2019
- Submit JPA – Late August 2019
  - w/ DMMP, AMMP, species consultations, Section 106
  - Respond to RFIs
- Incidental Harassment Authorization (IHA)
  - Pile Driving
- Final Design Efforts
  - Temporary in-water Structures (roadway trestles, temporary quay)
  - Demolition and Disposal/Beneficial Use of Existing Trestles
  - Construction Water Discharge (VPDES) (will likely require separate meetings)



Proposed North Trestle Replacements

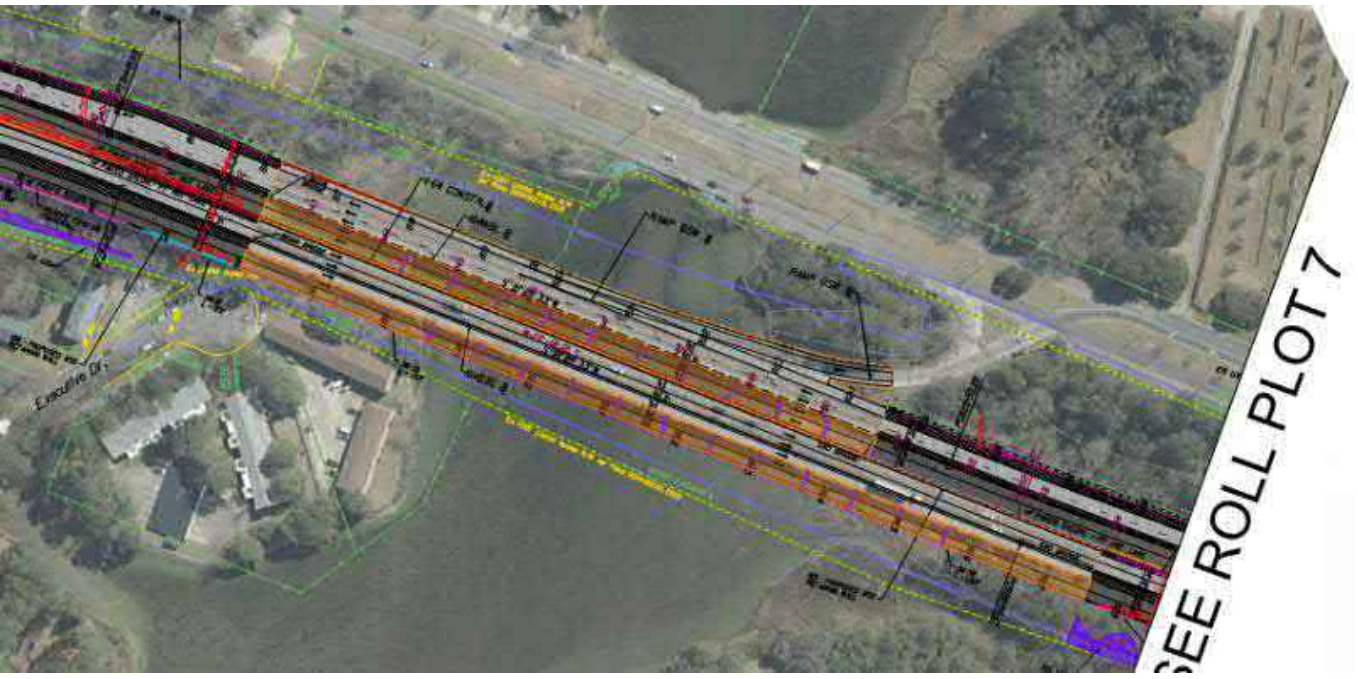


Proposed South Trestle Replacements



Proposed Willoughby Bay Trestle Improvements

Proposed Oastes Creek Crossing



Proposed Mason Creek Crossing

Other Discussion Points

Meeting Summary

Project: I-64 Hampton Roads Bridge-Tunnel Expansion **Project No.:** 0064-M06-032

Client: VDOT

Meeting Title:	HRBT Expansion Project – Environmental Progress Meeting
Date:	April 24, 2019
Time:	10:30
Location:	Hilton Doubletree (Military Highway, VA) – Conference Hall

Attendees:

Name	Initial	Affiliation	Phone	email address
Craig Nicol	CN	DEQ	(757) 518-2173	Craig.nicol@deq.virginia.gov
Janet Weyland	JW	DEQ	(757) 518-2151	janet.weyland@deq.virginia.gov
Jeff Hannah	JH	DEQ	(757) 518-2146	jeffrey.hannah@deq.virginia.gov
Melinda Woodruff	MW	DEQ	(757) 518-2174	melinda.woodruff@deq.virginia.gov
Ed Sundra	ES	FHWA	(804) 775-3357	Ed.sundra@dot.gov.com
John Mazur	JM	FHWA	(804) 775-3329	john.mazur@dot.gov
Angela Stowe	AS	HRCP	(845) 216-3052	Angela.stowe@hdrinc.com
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Bud Morgan	BM	VDOT	(757) 376-2606	Robert.morgan@vdot.virginia.gov
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Meeting Summary

Name	Initial	Affiliation	Phone	email address
Steve Begg	SB	VDOT	(804) 786-4304	Steve.begg@vdot.virginia.gov
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Kim Blossom	KB	VHB	(757) 509-0736	kblossom@vhb.com
Neville Reynolds	NR	VHB	(804) 695-4344	rreynolds@vhb.com
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Allison Lay	AL	VMRC	(757) 247-2254	allison.lay@mrc.virginia.gov
Fred Parkinson	FD	WSP/VDOT	(757) 285-1797	Fred.parkinson@wsp.com
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Meeting Notes:

No.	Description	Action
1	**Introduction**	
1.1	DG (HRCP) introduced the meeting and gave a presentation covering: • Brief Re-cap of the Section 408 meeting • Environmental Permitting Schedule • Material Management, Beneficial Use and Disposal JD (HRCP) presented slides covering the HRCP team's approach to compensatory mitigation • The planned Habitat Condition Assessment • Impacts to Species and Habitats • Hydrodynamic Model OB (HRCP) presented slide relating to the temporary MOT trestle construction sequence. A copy of the presentation slides are appended to the meeting minutes. JIMA – advised that detailed meetings between stakeholders and HRCP regarding specific issues can be organized. If required, please email HRCP.	
2	**Brief Recap of Section 408 meeting**	
2.1	DG / JIMA (HRCP) provided a brief recap of a meeting between the project team and maritime stakeholders regarding the Section 408 held earlier in the day. Approximately 530 borings will be obtained. Three types of tests are identified in the envisioned: 1. SPT – Standard Penetration Test – this uses a 4-inch dia. drill to obtain samples at depth and records blow counts	

Meeting Summary

No.	Description	Action
	2. CPT – Cone Penetrometer Test. This is a much smaller diameter rod which is pushed into the ground to measure ground resistance. ENV/Sonic – Sonic is another name for vibracore. These cores will use Lexan liners to obtain undisturbed samples for environmental testing.	
3.0	**Environmental Permitting Schedule**	
3.1	DG (HRCP) presented the project's updated environmental permitting schedule (see attached presentation). Post-meeting note: NWP6 application will be submitted on or before 24 May 2019. The JPA pre-app meeting has been tentatively set for July 10, 2019. GJ (USACE) – USACE will need early information on water treatment discharge for the full JPA with the intent to include the provided info in the USACE public notice. DG responded that the VPDES application will be submitted prior to the JPA. A pre-application meeting for the Construction General Permit is planned to be held with VDEQ Tidewater office. GJ – asked whether stormwater facilities will be identified. JD – (HRCP) confirmed.	
4	**Material Management, Beneficial Use and Disposal**	
4.1	DG (HRCP) presented waste disposal quantity estimates by type; identified management and disposal facilities; and waste transport routes. JIMA (HRCP) - noted that the numbers presented are the maximum currently expected, but these will be confirmed when the supplementary geotechnical/environmental investigations are complete. We foresee that the volume may be reduced – mainly in dredged materials.	
5	**Habitat Condition Assessment (HCA)**	
5.1	JD (HRCP) presented slides on tidal and non-tidal habitat types, by area; benthic resources in open water habitat; the 2018 benthic survey (to be used for the JPA); and impacts to habitats and species. No opposition was voiced to HRCP's assertion that no TOY restrictions are anticipated for oyster and Atlantic sturgeon.	
6	**Hydrodynamic Model**	
6.1	JD (HRCP) presented slides on the VIMS hydrodynamic model and island/trestle footprints.	
6.2	EH (VIMS) – stated that VIMS would need to compare the footprint of the islands and trestles with what has been used in the VIMS model. DG (HRCP) – responded that the footprint drawings can be provided.	EH e-mailed DG on 4/26 confirming that VIMS only requires shapefiles

Meeting Summary

No.	Description	Action
	EH informed HRCP that any geo-referenced file types were likely suitable to check against the VIMS modeling. She will confirm. DG – stated that most of the water circulation takes place in the main channel. However, there are no changes to the island footprints which would narrow the cross section of the channel, therefore changes to the hydrodynamics would be insignificant. EH – noted that small changes may not require remodeling, but major changes could require remodeling. JIMA (HRCP) asked about expected timeframe to re-run the Hydrodynamic model, EH stated that it would be weeks, not months. JIMA (HRCP) asked whether phases of construction or only worst-case situation would be required. EH confirmed that only worst-case would be needed.	
7	**Temporary Trestle Construction Sequence**	
7.1	OB (HRCP) presented slides on the temporary trestle construction sequence.	
8	**Questions and Discussion**	
8.1	JW (VDEQ) – asked whether we knew where staging/lay down area(s) for demolition of trestles would be. OB (HRCP) – replied that the details are not yet available and will be determined later, as this will occur late in the project.	
8.2	JW – Asked whether the project team have been in contact with appropriate authorities about drinking water and shellfish. DG (HRCP) asked whether JW could provide contact details for the relevant people to contact. JW (VDEQ) – suggested Keith Skiles at Virginia Dept. of Health as a contact.	
8.3	EH (VIMS) – requested information on types of piles to be used. JIMA (HRCP) – stated that the permanent trestle piles would be concrete, but in certain areas, such as the TBM Dock Trestle , round steel piles will be required. HRCP are investigating alternative pile types for the temporary work trestles for bridge construction. BMPs will be used to mitigate noise and other impacts.	
8.4	CN (VDEQ) – Enquired about public interface / website; environmental justice in relation to the road widening, and plans for collaboration with other projects, such as the Elizabeth River Project.	

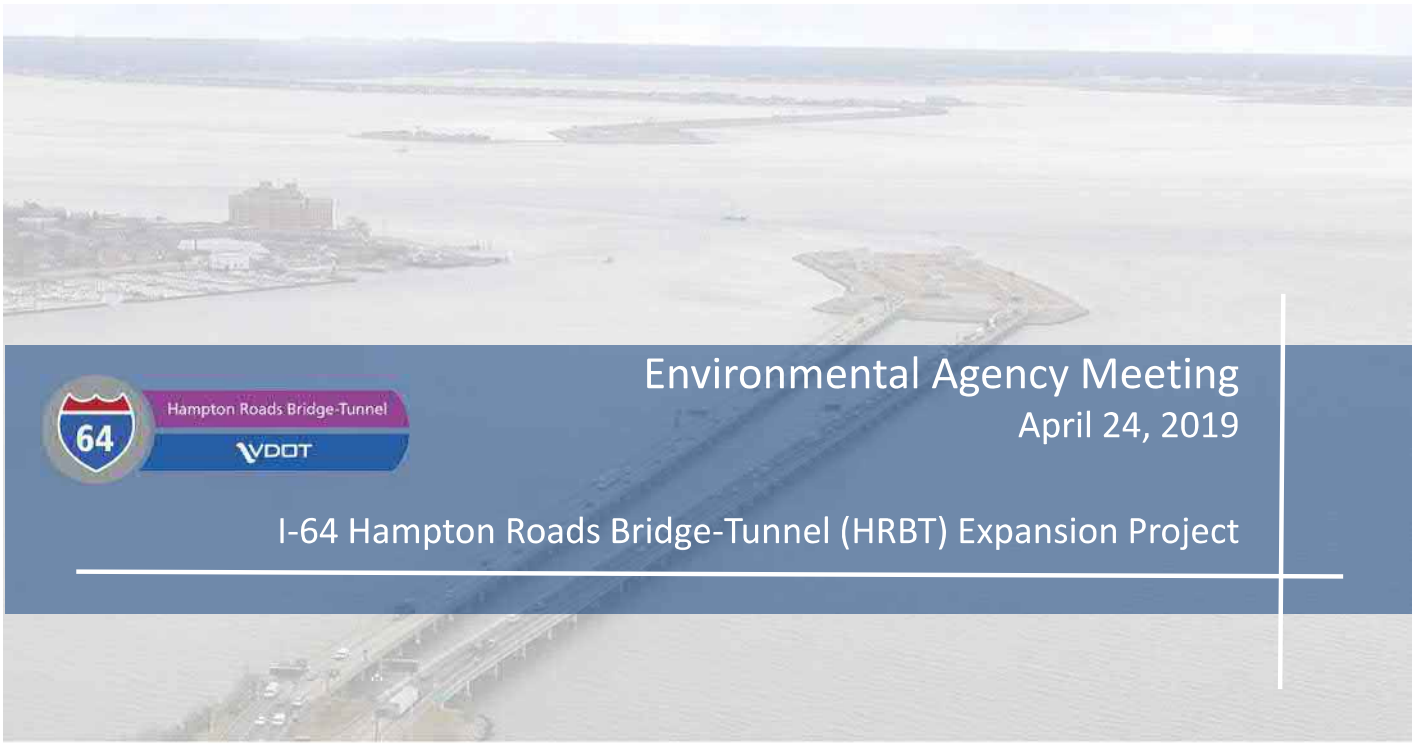
Meeting Summary

No.	Description	Action
	SS (VDOT) – responded that there is an existing HRCP website, and there has been a mailing list for 3-4 years. In terms of environmental justice FHWA has carried out a lot of work during the NEPA process to ensure that these issues have been addressed. CN – added that there is an advantage to releasing limited project information to the public in advance of the public consultation as the feedback will inform decision making. However, there are risks associated so this is only a comment for consideration.	
8.5	EH (VIMS) asked whether it was HRCP's intention to test only the new chemical additives being considered for this project. DG (HRCP) responded that the geo-strata for the vast majority of tunneling is similar to PTST. The new TBM will use fewer chemical (e.g. no foaming agents), and the main additive will be bentonite (clay). Of the additives tested at PTST, we understand which chemicals might lead to TPH readings >50ppm so we will avoid these additives and will only test new chemicals not used on PTST. Decant water will be processed through the water treatment plant. The testing regimen is very stringent and includes WET testing. TBM material will only be disposed of in upland facilities, and discharge water will be the focus of our attention in relation to the marine environment. EH – noted that VIMS will likely recommend that all additives to be used on this project be tested. EH referred DG to a letter issued on the same subject during testing for the PTST project. JIMA (HRCP) stated that we are testing all strata - and added that it would be better not to refer to letters from other projects. JW (DEQ) added that DEQ did not accept the testing data previously due to data quality issues. JIMA confirmed that HRCP will be testing all chemical additives to be used with the HRBT TBM, regardless of whether they were tested on PTST. HRCP's estimated boring quantity allows for it. Since there were issues raised with previously followed methodology, it was agreed that DG (HRCP) will send a memorandum before the next meeting specifying the procedure HRCP is planning to test for stakeholders' review and comment preceding the May monthly agency meeting. DG (HRCP) noted that a specific dedicated meeting could be set up in relation to this issue. DG added that there is a need to define the sampling and analysis method in coordination with the stakeholders prior to initiation the marine boring program.	HRCP to send a memorandum on proposed testing for team review and comment VMRC/USACE/VIMS/VDEQ to clearly set expectations regarding testing.
8.6	GJ (USACE) – noted that HRCP should provide information on pile driving, numbers, sizes, pile types and driving equipment.	
8.7	JW (DEQ) – asked whether it is planned to follow VDOT's standards and specifications and self-certify for stormwater and erosion & Sediment Control, i.e. VDOT will review/approve and share with DEQ, as DEQ don't typically review VDOT designs. With this in mind, a VDEQ pre-application (recommended in the March 27 meeting) is no longer required.	

Meeting Summary

No.	Description	Action
	SS (VDOT) responded that this is the intention, similar to previous D/B projects.	
8.8	EH (VIMS) – asked about quantifying SAV impacts, looking at sediment and shading impacts, and whether 5-year areas would be used. JD (HRCP) confirmed that 5 years would be used. DG stated that no direct impacts are anticipated at this point, however there may be shading impacts.	
8.9	A brief discussion pertaining to mitigation was held. JD (HRCP) suggested that mitigation could form a topic for a special meeting. GJ – added that USACE, VIMS, EPA, VMRC, FHWA and others would need to be involved. JIMA (HRCP) asked if anyone had additional points of contact for mitigation programs that we may not be familiar with. GJ – suggested the Elizabeth River Project, Tidal bank – New Mill Creek. Credits may be available, but not sure if they are advanced. If in-kind credits are available in the Hydrologic Unit Code (HUC), USACE may direct the HRBT project team to buy these credits	HRCP to schedule meeting
8.10	EH (VIMS) – dates for meetings. Difficult for VIMS to participate in June 24 week and 4th July week for the JPA pre-application meeting. DG (HRCP) – suggested May 29, 2019 for the next general meeting. GJ (USACE) asked for the project team to send an email prior to issuing the Minutes of Meeting (MOM) to ask for available dates.	HRCP

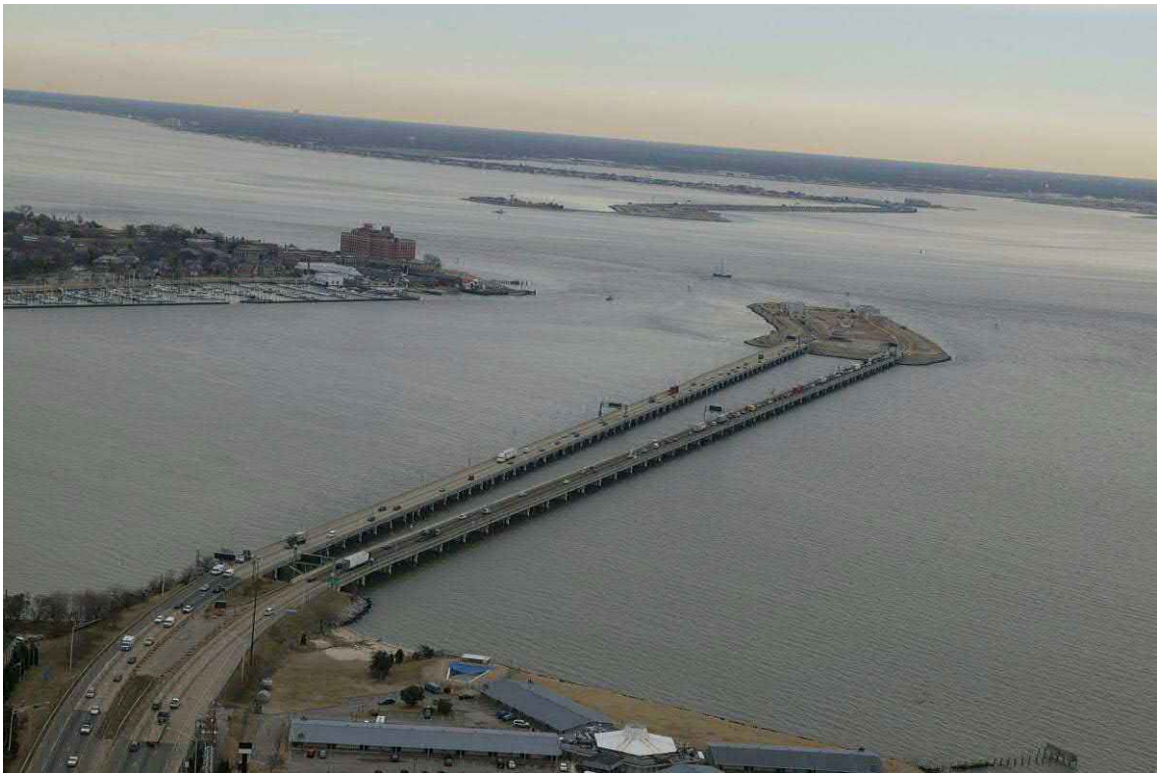
MEETING CLOSED



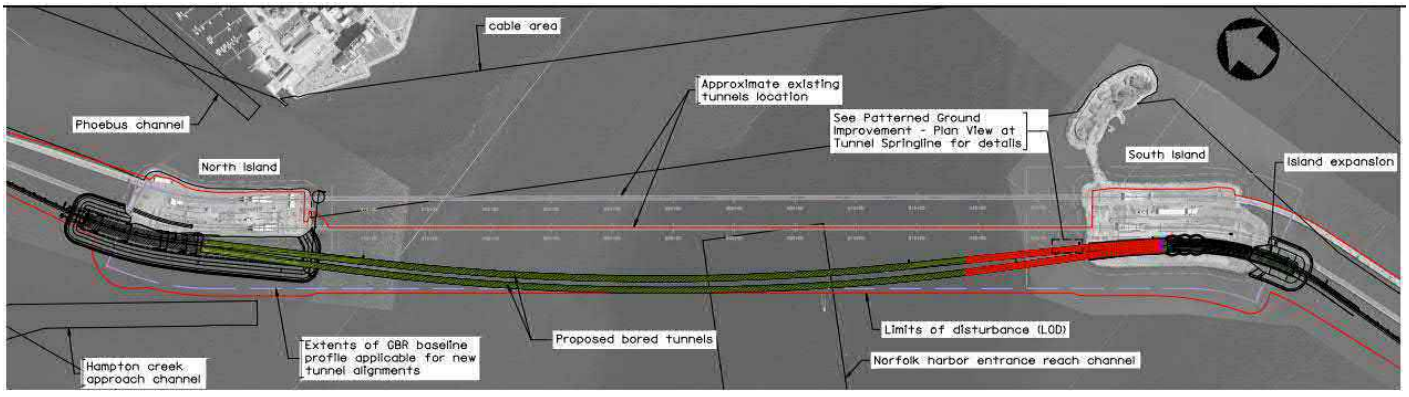
Agenda

- Introduction
- Brief Re-cap of Section 408 meeting (HRCP)
- Environmental Permitting Schedule
- Material Management, Beneficial Use and Disposal
- Habitat Condition Assessment
- Impacts to Species and Habitats
- Hydrodynamic Model
- Trestle Construction sequence
- Additional Issues/Questions

Introduction



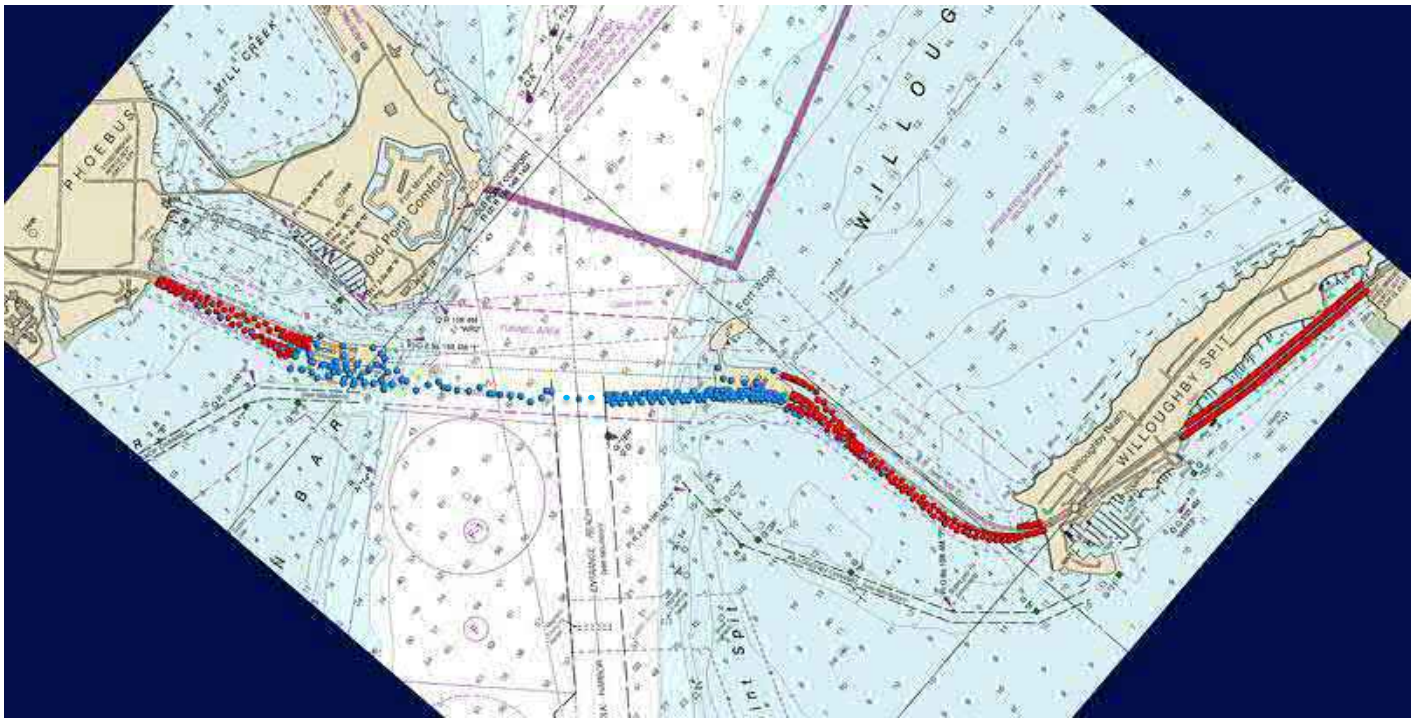
Introduction



- In-water work includes:
  - Bored Tunnel Alignment between existing North and South Islands along a refined alignment
  - Island expansion
  - Trestles

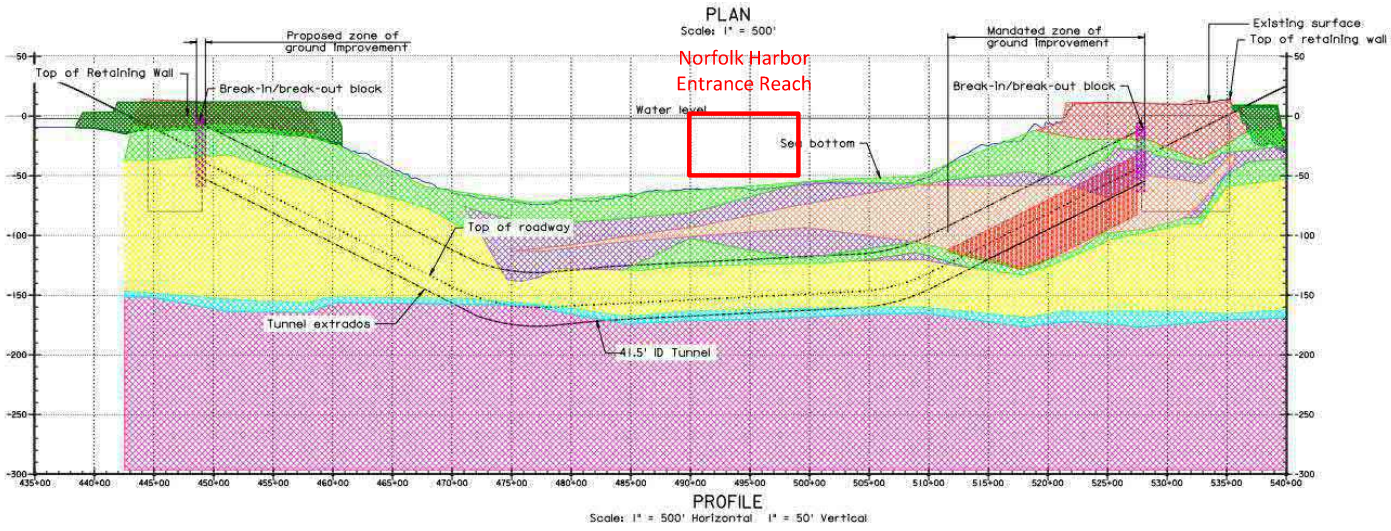
Brief Re-cap of Section 408 Meeting

- In-Water Boring Plan 2019



- Trestle Related Borings
- Tunnel Related Borings

Introduction



- Bored Tunnel between existing North and South Islands along a refined alignment

Brief Re-cap of Section 408 Meeting

- Supplemental Geotechnical Investigation
- Environmental Borings
  - Baseline characterization of materials for disposal or re-use
  - Materials Management - testing as required for placement or disposal (material management plan)
    - e.g. 206,000 cy of clean sand needed for north island expansion
    - Amended Tunnel Boring Machine (TBM) material

Brief Re-cap of Section 408 Meeting (HRCP)

- North Island

Brief Re-cap of Section 408 Meeting (HRCP)

South Island

Updated Environmental Permitting Schedule

Submit NWP6 JPA to VDEQ, VMRC and USACE – 24 May 2019

JPA Pre-app meeting – 10 July 2019

Submit JPA Application – early September 2019

Section 106 coordination – week of 24 June 2019

Coordination with USCG for Bridge Permit – week of 12 August 2019

VPDES pre-application for WTP discharge – 1st week of August 2019

Material Management, Beneficial Use Disposal

Material Disposal Schedule and Quantities

Volume and Type of Material for Disposal

Material Source – Construction Activity	Volume (bulked)
Bored Tunnel Material	968,000 CY
Dredged Material	380,000 CY
Ground Improvement Residuals	400,000 CY
Slurry Wall Residuals	150,000 CY
Excavated soil for the Tunnel Approach Structures (on Islands)	720,000 CY
Trestle Demolition Concrete	59,000 CY
Excavated upland soils from Roadway Construction	23,000 CY
TOTAL	**2,700,000 CY**

Material Management, Beneficial Use Disposal

Identified waste handling and disposal facilities

Name	Location	Transportation Method	Agreed Capacity	Limitations or Restrictions
Pre-con Marine (Transfer Facility)	Chesapeake, VA	Barged directly from each island	2.8 million cubic yards of amended tunnel material and/or dredged materials	No limitations, this is a waste transfer facility
Dominion Recycling Facility	Chesapeake, VA	Barged from South Island to Pre-Con inclusive of 1.6 mile transfer trip	2.8 million cubic yards of amended tunnel material and/or dredged materials	Disposal criterial in accordance with 9VAC20-81-660 D.3 (less than 50 ppm total petroleum hydrocarbons (TPH) and 10 ppm BTEX and are located sufficient distances from sensitive receptors)
Port Tobacco (Weanak)	Shirley Plantation, Charles County, VA	Barged directly from each island	2.8 million cubic yards of sediment and/or dredged materials	Must meet their Exclusion Criteria which includes materials having less than 45 ppm TPH

Material Management, Beneficial Use Disposal

Habitat Condition Assessment

Waters and Wetland Habitat by Area

Resources	North Shore	River and Harbor	Willoughby	Norfolk	I-564
Estuarine Subtidal Open Water	X	X	X	X	
Estuarine Intertidal Emergent Marsh	X		X	X	
Estuarine Intertidal Reef	X	X			
Estuarine Intertidal Scrub Shrub	X		X	X	
Estuarine Intertidal Unconsolidated Shore Sand	X	X	X	X	
Estuarine Intertidal Unconsolidated Shore Mud	X				
Jurisdictional Ditch	X		X		
Palustine Emergent	X		X	X	X
Palustrine Forested	X		X	X	
Palustrine Scrub Shrub	X		X	X	
Palustrine Unconsolidated Bottom				X	X
Lower Perrenial, Riverine			X		
Intermittent, Riverine				X	

Habitat Condition Assessment

2018 Benthic survey

- Soft Bottom
  - Fine to medium sand
  - Reef building polychaetes
  - Amphipods
  - Oligochaetes
  - Sand Lancelets
  - Mud crabs
- Intertidal Rocky Shore
  - Barnacles
  - Amphipods
- Subtidal Rocky Shore
  - Oyster
  - Ribbed mussels
  - Algae
  - Sponges Bryozoans
  - Amphipods/Polychaetes
  - Bryozoans
  - Anemones

Figure E-3. Diver scraping the rock and suctioning the sample into a collection bag at a subtidal site during the portal island benthic survey

Impacts to Species and Habitats

- Anadromous (Sturgeon)
  - Phase II Results from Dr. Greg Garman
    - Adults and some subadults move through the channel quickly (very short periods of residence)
    - Juveniles typically don't occur in the project area
  - Impacts from the HRBT Expansion are not likely
    - No construction in the navigation channel
    - No TOY Restriction anticipated

Impacts to Species and Habitats

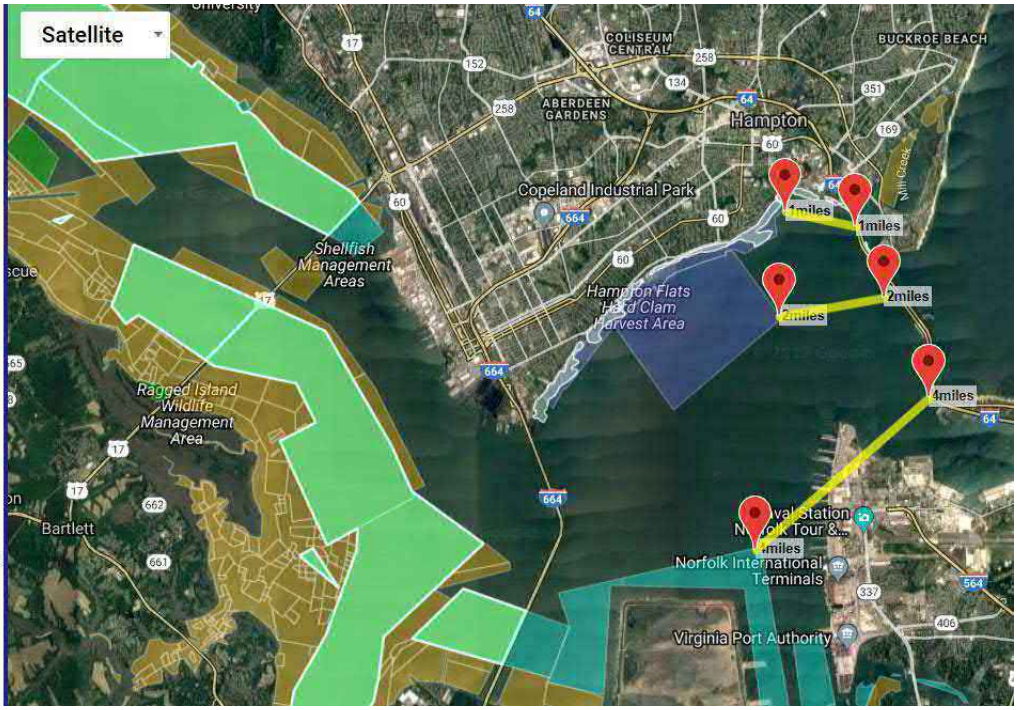
Shellfish

Map Layers

Shellfish Grounds
- Private Oyster Ground Leases
- Oyster Ground Applications
- Shellfish Condemnation Zones By VDH
- Open Harvest Areas 4 VAC 20-720
- Public Grounds
- Public Clamming Grounds
- Oyster Sanctuaries
- State Marsh and Meadow Lands
- Submerged Aquatic Vegetation Sanctuaries
- Submerged Aquatic Vegetation 2013-2017
- PRFC Jones Shore Special Mgmt Area

Fixed Fishing Devices
- Pound Nets
- Staked Gill Nets
- Fyke Nets

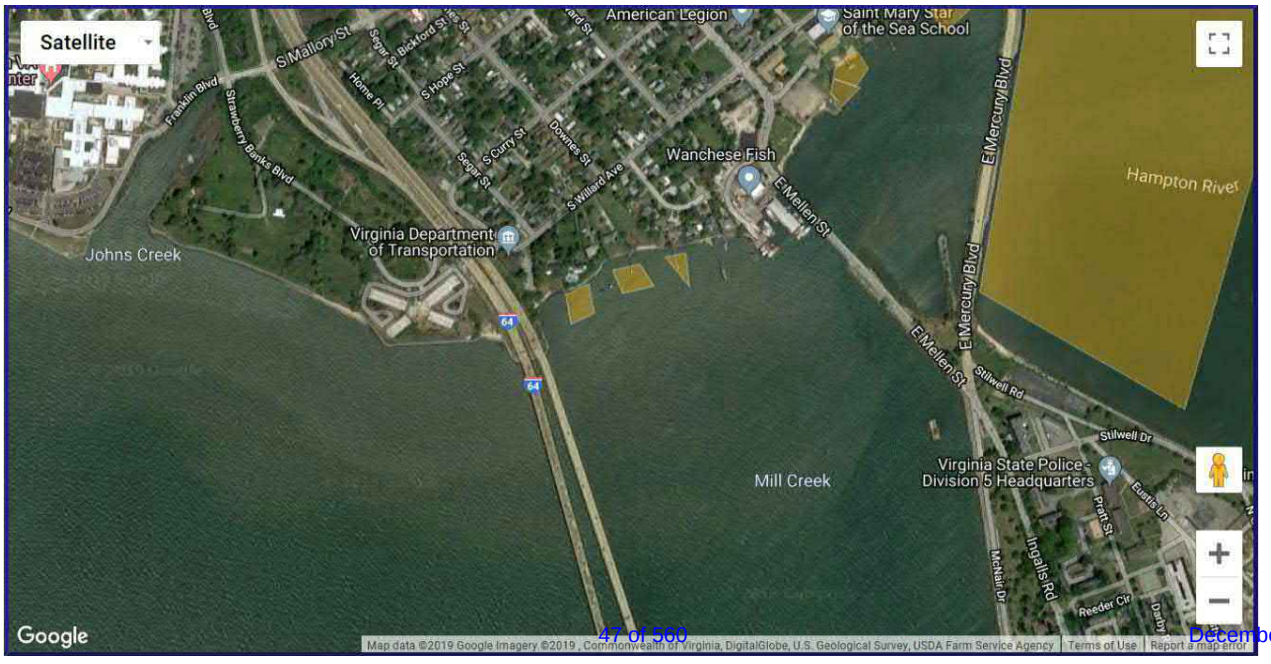
Habitat Permits
- Habitat Permit Applications Open Since 2012
- Habitat Permit Applications in 2016
- Habitat Permit Applications in 2017
- Habitat Permit Applications in 2018
- Habitat Permit Applications in 2019
- Oyster Gardening Permits



Impacts to Species and Habitats

Shellfish

Oyster Lease Grounds



Hydrodynamic Model

- HRBT VDOT Natural Resources Technical Report Appendix B – Summary of Hydrodynamics Modeling
  - 3-D hydrodynamic-sedimentation model developed in late 1990's by Virginia Institute of Marine Science (VIMS)
    - Model was built simulate existing conditions and to assess impacts of proposed bridge-tunnel infrastructure on tides, currents, circulation, salinity, and sedimentation

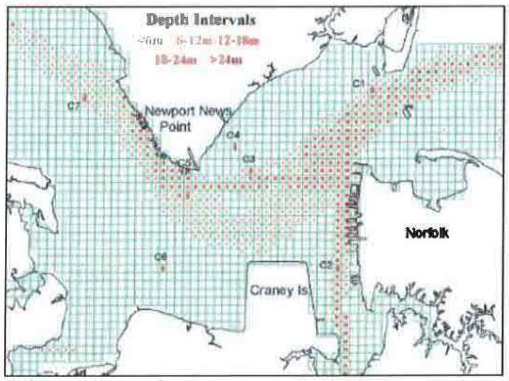
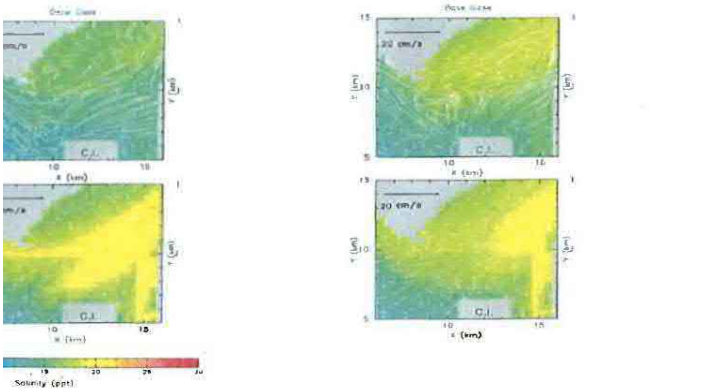


Figure 2. Location of Tidal Current Simulation Stations (VIMS 1999)



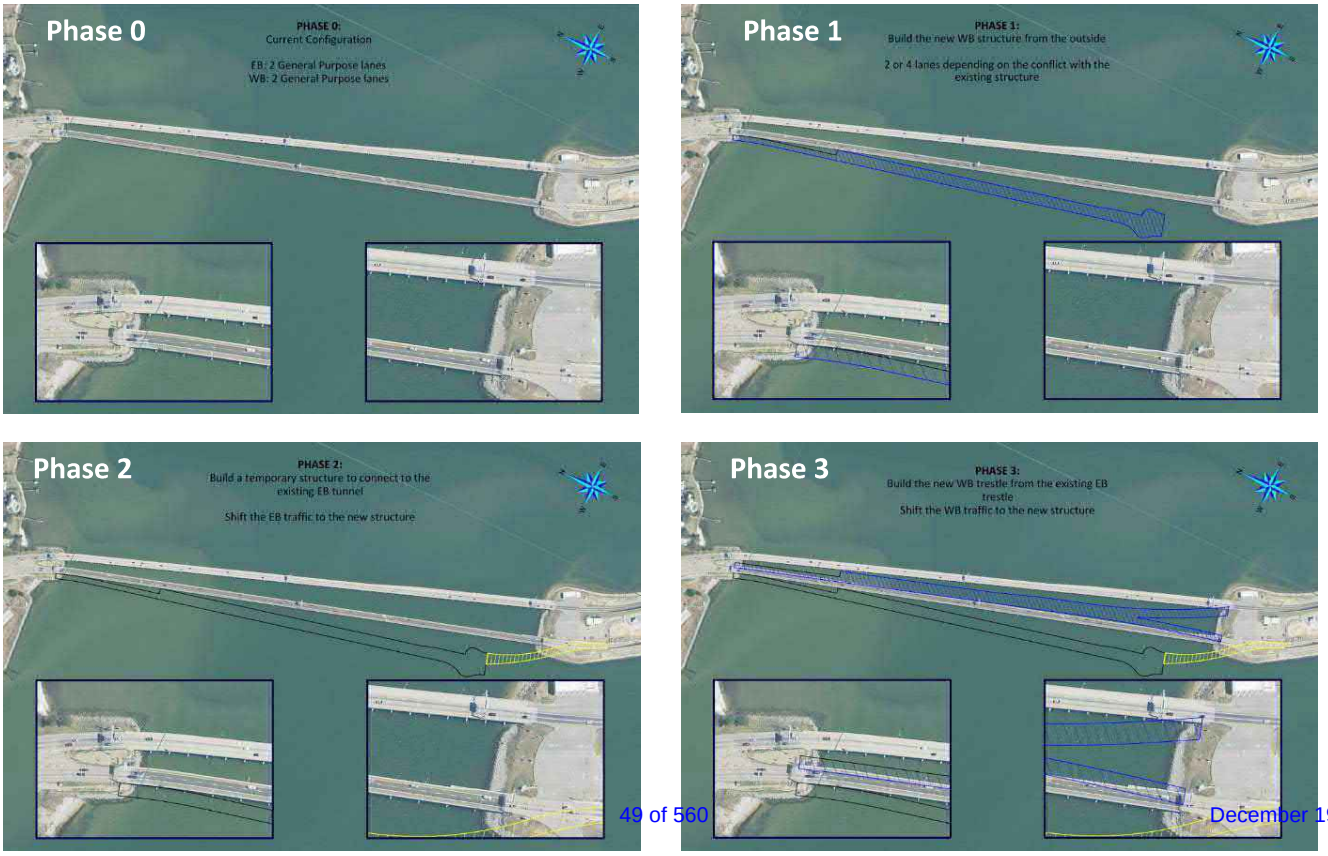
ally-averaged Current and Salinity: Apogean-neap Tide (Left) and Perigean-spring Tide (Right), Hampton Roads (adapted from VIMS 1999)

Hydrodynamic Model

Temporary Trestle Construction Sequence

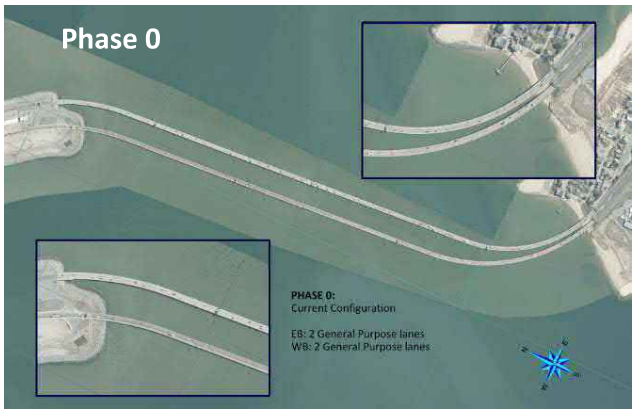
- Temporary Trestles are required for MOT
- Temporary (<1 year) and extended (>1 year) impacts are anticipated due to temporary trestles

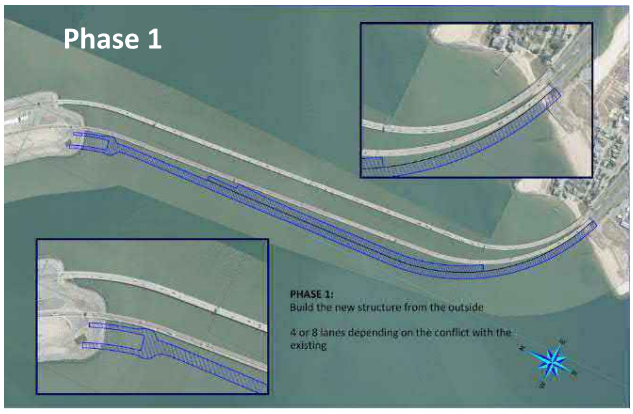
Trestle Construction Sequence

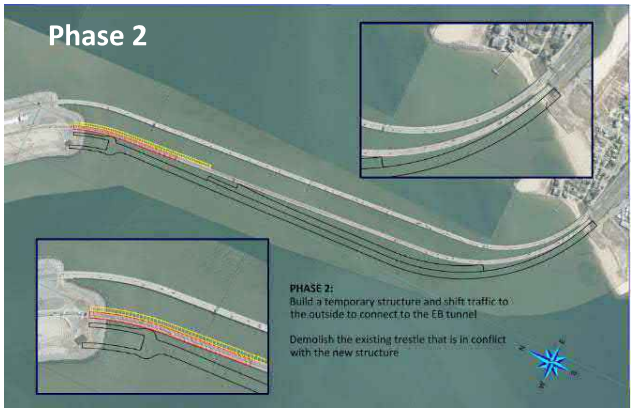


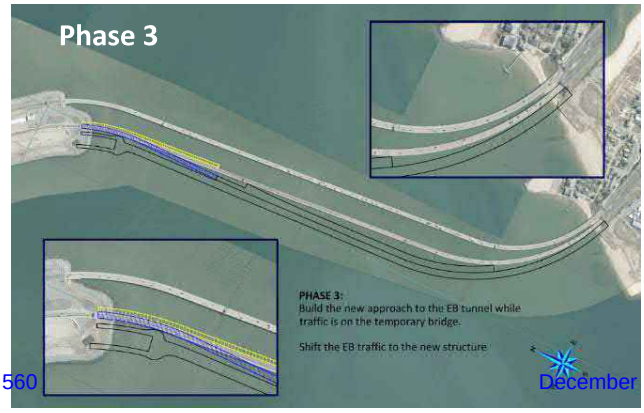
Trestle Construction Sequence

Trestle Construction Sequence

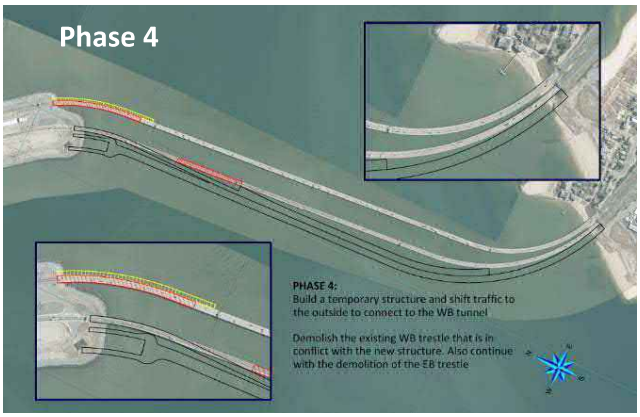


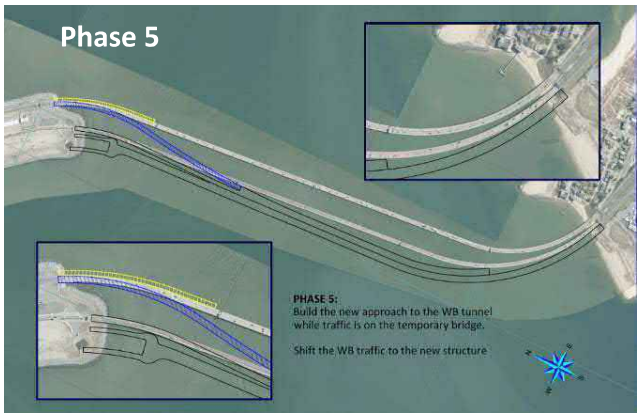


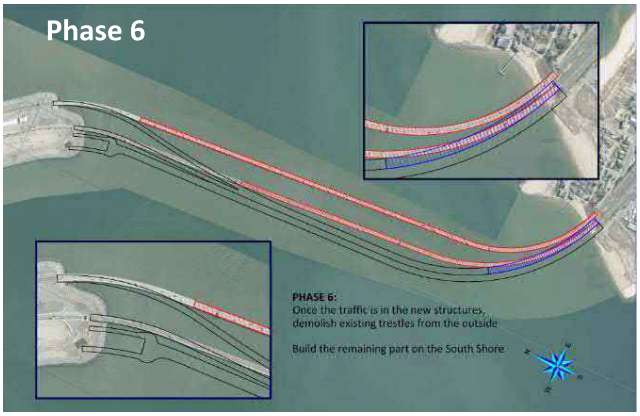


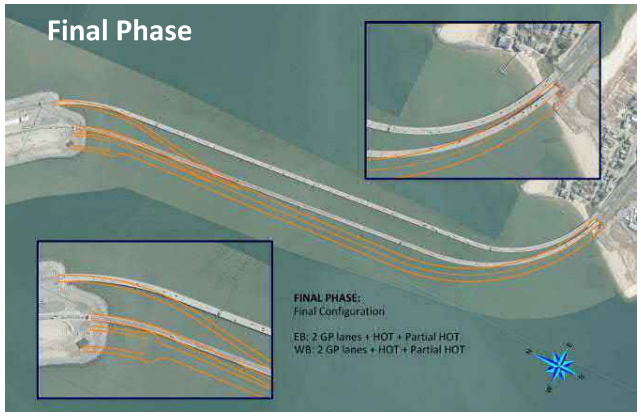


Trestle Construction Sequence









Additional Issues

Questions and Discussion

Meeting Summary

Project: I-64 Hampton Roads Bridge-Tunnel Expansion Project No.: 0064-M06-032

Client: VDOT

Meeting Title:	HRBT Expansion Project –Section 408 Meeting with Maritime Stakeholders
Date:	April 30, 2019
Time:	3:00
Location:	Virginia Port Authority, Norfolk, VA

Attendees:

Name	Initial	Affiliation	Phone	email address
Zac Canody	ZC	VPA	(757) 634-5466	zac.canody@PortofVirginia.com
Steve Jones	SJ	USN	(757) 708-4491	Steve.g.jones@navy.mil
David Field	DF	HRCP	(571) 212-9332	David.field@mottmac.com
Douglas Gaffney	DG	HRCP	(856) 924-3363	Douglas.gaffney@mottmac.com
Bud Morgan	BM	VDOT	(753) 376-2606	Robert.morgan@vdot.virginia.gov
Solene Vazelle	SV	HRCP	(757) 933-0878	Solene.vazelle@vinci-construction.com
David Barrier	DB	HRCP	(514) 663 9198	David.BARRIER@vinci-construction.com
Neville Reynolds	NR	VHB	(804) 695-4344	rreynolds@vhb.com

Meeting Notes:

A copy of the presentation provided by HRCP will be appended to the meeting minutes.

No.	Description	Action
1	Overview of the Hampton Roads Bridge Tunnel Expansion Project	
1.1	An overview of the project was provided by DG. It was stressed that this meeting is for the NWP6 and Section 408 for the supplemental boring program only. ZC mentioned that good quality sand material in the channel does not start until east of the CBBT. Shallow areas of Anchorage F may be an option for obtaining sand for beneficial use. DM from the inner harbor (West of HRBT) goes to Craney Island, east of HRBT goes to Dam Neck (DNODS). ZC stated that VPA had additional borings in the channel that we could obtain. ZC stated that ships regularly stray outside the channel toward the F Anchorage but would stay in the channel if the know coring is occurring.	HRCP
2	Proposed Supplemental Geotechnical Water Borings	

Meeting Summary

No.	Description	Action
2.1	DG (HRCP) – presented slides on Proposed Supplemental Geotechnical Water Borings The supplementary borings are to confirm the existing geotechnical conditions and provide material for environmental testing. One (1) borehole is proposed within the navigational channel and an additional two (2) boreholes are only if needed. We do not anticipate that the additional boreholes will be required. An elevation view of the stratigraphy and proposed alignment of the bored tunnel was shown in relation to the Norfolk Harbor Channel.	
3.0	Marine Zones Overview	
3.1	DG (HRCP) – presented the zones that have been define for the geotechnical in-water borings and CPTs. Three types of tests are identified in the envisioned: 1. SPT – Standard Penetration Test – this uses a 4-inch dia. drill to obtain samples at depth and records blow counts 2. CPT – Cone Penetrometer Test. This is a much smaller diameter rod which is pushed into the ground to measure ground resistance. 3. ENV/Sonic – Sonic is another name for vibracore. These cores will use Lexan liners to obtain undisturbed samples for environmental testing.	
3.2	DG (HRCP) – noted that there are 530 boreholes planned up to 250ft in depth, with drilling taking place 24hrs daily. We do not envision impacts to maritime traffic due to daily communication and built-in flexibility. Zone 4 1. A total of 8-10 boreholes in the approach to the channel (7) and the channel (1 to 3) will require divers on standby in the event of an emergency demobilization. 2. SJ stated that fueling operations and vessels go to Little Creek (Mercedes Holland), Norfolk, Yorktown, Langley, and the Naval Shipyard (Doug Taylor). DG to email Steve to get contact information. 3. SJ noted that there will be in increased amount of vessel traffic in November and December as ships are returning for the holidays, and then redeploying. 4. SJ stated that we could send questions pertaining to preferred days of the week for scheduling the in-channel borings.	HRCP HRCP
3.3	1. SJ provided information pertaining to two specific areas of concern. At Mason Creek, cranes will be a concern during construction, and possibly drill rigs, due to the glide slope into a landing area. Coordination will be required. Construction at Mason Creek does not fall under the existing easement at Mason Creek. Therefore a request will need to be made from VDOT to NAVFAC Public Works. Our team is to contact Glenn Redavid (Navy). 2. Willoughby Bay - Helicopter and dive training takes place in the Bay, and LCATs use the old seaplane ramps. The HRCP team may need to reconsider	HRCP

Meeting Summary

No.	Description	Action
	where in-water staging is required due to NAVY training. This is primarily a consideration for the main JPA.	
4	Draft Navigation Plan and Flexibility and Responsiveness to Navigational Interests	
4.1	DG (HRCP) Presented slides on the Draft Nav Plan and Flexibility and Responsiveness to Navigational Interests (see attached presentation).	
5	Communication During Investigation	
5.1	SJ inquired about the communications protocols. DG (HRCP) noted that Scott Kibby (HRCP) has been designated as HRCP lead for maritime communications relating to the marine borings. He carried out a similar role on the PTST project. See attached presentation for more details about daily and weekly communications.	
6	Schedule	
6.1	DG (HRCP) – presented slides pertaining to the proposed Schedule for borings and also permit applications.	
7	Safety	
7.1	DG – presented slides on safety (see attached presentation)	
7.2	SJ inquired about planning for major storm events. DF responded that the drilling vessels will either return to their home berths or shelter in Willoughby Bay. SJ stated that Navy vessels will either deploy or shelter in place - usual decision 120 hours ahead through monitoring.	
9	Additional Issues	
	Next steps: • HRCP will begin preparing the NWP6 JPA application • Operational Plans and Safety Plans will be forwarded to stakeholders for review and comment.	HRCP

Meeting Minutes

Project: I-64 HRBT Expansion

Subject: HRBT Sampling and Analysis Plan Webinar

Date: Wednesday, May 22, 2019

Location: GoTo Meeting and HRCP Office 5701 Thurston Ave VAB

A webinar presentation of the contents of the Sampling and Analysis Plan (SAP) was provided on May 22, 2019. The presentation outlined the protocols included in the SAP as well as detailed the TBM activities, which will provide for the basis of our bench scale testing.

Attendance List

Doug Gaffney (HRBT DJV)
Taylor Sword (HRBT DJV)
Ellen Moore (HRBT DJV)
Emily Hein (VIMS)
Scott Smizik (VDOT)
Taylor Sprenkle (WRA)
Melinda Woodruff (VDEQ)
Chris Frye (VHB)
David Watson (HRBT DJV)
David Barrier (HRCP)
Carolyn Keeler (Stantec)
Richard Giffen (DJV)
Yvonnick Rescamps (CJV)
Mike Unger (VIMS)
Lyle Varnell (VIMS)
Jeff Hannah (VDEQ)
Craig Nichol (VDEQ)
Janet Weyland (VDEQ)

Question/Comment 1 – Will toxicity testing be performed?

Response – We acknowledge that toxicity testing will be a requirement on the effluent of the WTP. We will have filtrate water from the filter press (from the bench scale test), but this will not be representative of the treated water from the WTP. As the identification of additives are

pending at this time and the design of the WTP is pending, we have not included the testing in the SAP. The toxicity testing protocols will be developed and implemented at a later date.

Question/Comment 2 – What are the next steps with the SAP? (presented to VDEQ)

Response – VDEQ, in response, requested a timeframe to provide comments. The JV requests that comments on the sampling of the beneficial reuse be provided as soon as possible, as these samples are currently undergoing analysis at the laboratory. We would appreciate comments no later than Thursday, May 30, 2019. Comments pertaining to the remainder of the SAP should be submitted by June 14, 2019.

Question/Comment 3 – Please review the analytes listed in the ER-Ms as compared to the analytical suites included in the SAP.

Response – In reviewing the ER-Ms to the full analytical suite proposed in the SAP, those analytes with sediment screening levels are included in the analysis being performed so that an evaluation of the sediment to the screening values can be performed.

Question/Comment 3 – Please verify that the technical memorandums identified on page 2 of the SAP are incorporated into the sampling.

Response – The technical memorandums noted on page 2 of the SAP are related to the upland boring locations. The memorandums will be utilized in the design of the upland boring program, whereas, borings/sampling will be targeted towards areas of Potential Environmental Concern. Analytical testing/parameters will be based on contaminants of concern for those areas. A separate SAP for upland borings will be generated and forwarded for review.

Question/Comment 4 – What samples have been taken?

Response: On-island borings were installed to depths up to 200 feet below ground surface; with 3 borings located on the north island and 12 borings located on the south island. A total of 8 borings were installed within the tricell/portal entry area to evaluate materials for beneficial reuse and/or disposal. Samples were obtained from each of the 8 borings at two intervals – surface grade to 25 feet bgs and below 25 feet bgs to end of boring. These samples have been submitted and are currently being analyzed. Laboratory data is expected to begin to be received the first week of June. The remainder of the borings were installed utilizing lexan liners, which, upon retrieval were capped and sent to refrigeration. These cores will remain in refrigeration until the TBM additives are identified, at which time the cores will be processed and samples collected for bench scale testing. Two groundwater grab samples have been obtained and sent in for analysis. The grab

samples will be useful in identifying background conditions and assist in the design of the STP/WTP.

Question/Comment 5 – Please identify the decon procedures for marine borings.

Response: A separate note will be forwarded which will outline the decontamination procedures for the marine borings. The detail will include the location, procedures and equipment proposed.

Overview

- Introduction
  - Purpose
  - Objective
  - Data Quality Objectives
- Baseline Characterization
  - Beneficial Reuse
  - Material disposition / Disposal
- Background Analytical
- Bench Scale testing for TBM waste streams
- Additional Issues/Questions

2

Overview of Tunnel Area

3

Introduction

- Purpose of presentation is to provide introduction to, and process for, initial baseline sampling and analysis to :
  - Determine if material is suitable for reuse
  - Screening for determination of material for off site disposal at upland facility
  - Determine TBM slurry characteristics for design of water treatment plant
  - Determine TBM spoils (cuttings) characteristics for determination of beneficial/reuse or disposal options
- Objectives of SAP
  - Provide basis of / and protocol for collection of samples and testing
  - Gain Agency concurrence on methodology
  - Meet stated DQOs
  - Initial sampling guidance document

4

Data Quality Objectives (DQO)

- Data Quality Objectives
  - Goal is to characterize material to assist in determination of application (of material)
  - Information inputs include specific analytical data from specific samples – locations/depths of materials sampled representative of where material will come from
  - Boundaries, baseline characterization and general representation of materials anticipated to be encountered
  - Analytical approach defined for soil/sediment/ elutriate/ water – and analytical parameters defined, includes TBM additives, mix, generation of spoils and characterization of constituents
  - Performance criteria, lab qualifications, QA/QC, validation, applicable screening criteria
  - Plan for obtaining the data (SAP) methods and procedures

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Baseline Characterization

- Primary purposes:
  - Determination of beneficial reuse or not
  - Initial basis for materials disposition
  - Provide analysis of TBM amendments through bench scale testing
- Secondary purposes:
  - Provides background chemical analytical data for the strata
  - Provides samples for bench scale testing of material the TBM will bore through – emulate slurry and cuttings removal process and produce process water to test for design of water treatment application

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Sampling Locations

15 on land initial locations
Majority on South Island

Marine Sampling to follow

7

Table of borehole locations and depths for those on either South or North Island,

Location	Boring ID	Depth (Feet)	Lexan Liner Interval (depth bgs)
South Island	HRCP-L-ENV-023	100	Bagged
South Island	HRCP-L-ENV-024	90	Bagged
South Island	HRCP-L-ENV-025	90	Bagged
South Island	HRCP-L-ENV-026	70	Bagged
South Island	HRCP-L-ENV-027	55	Bagged
South Island	HRCP-L-ENV-078	200	25-200
South Island	HRCP-L-ENV-079	200	25-200
South Island	HRCP-L-ENV-081	200	25-200
South Island	HRCP-L-ENV-082	200	25-200
South Island	HRCP-L-ENV-083	60	Bagged
South Island	HRCP-L-ENV-084	45	Bagged
South Island	HRCP-L–ENV-085	45	Bagged
North Island	HRCP-M-ENV-013	100	25-100
North Island	HRCP-M-ENV-072	75	0-75
North Island	HRCP-M-ENV-077	200	25-200

Vibracore Drill Rig Typical set up.

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Overall Trestle and Tunnel Area Planned Borings

- In-Water Boring Plan 2019

Trestle Related Borings
Tunnel Related Borings

9

Scale Testing

- The following slides present -
- Multi mode and Variable Density Tunnel Boring Machine (TBM)
  - Different from the Earth Pressure Balance TBM
- Planned process flow diagram for Tunnel Boring Machine (TBM), Slurry Treatment Plan (STP) and the Water Treatment Plant (WTP)
  - Closed System
- 3-D Model of Bore (tunnels) through Strata
- 3-D Model of Bore depicting alternate view of how Strata mix will vary as the tunnel is advanced
- Overall tunnel area generalized cross section

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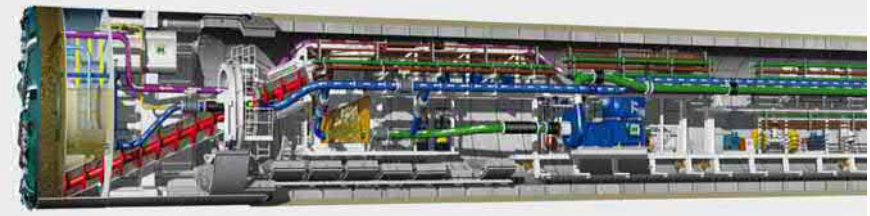
Tunnel Boring Machine (TBM)

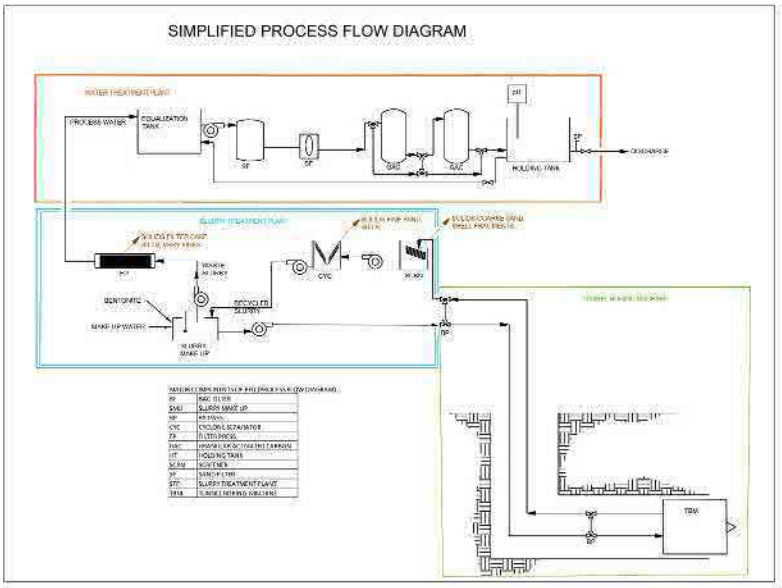
TBM SELECTION

Multi mode and Variable Density with Visitable Cutterhead



11

Tunnel Boring Machine / Process



Bench Scale Testing

- Identification of manufacturers for TBM additives and pre-screening of TBM additives
  - Review SDSs for ecological toxicity
  - Evaluation for obvious hazardous substances – screen out
- Academia outreach to implement bench testing protocols
  - Simulate STP and WTP processes
  - Emulate separation process and analysis of waste streams

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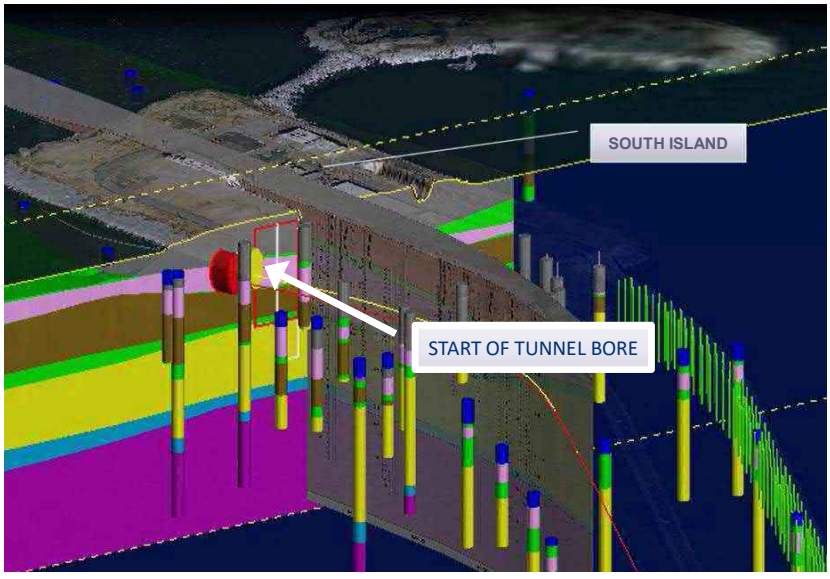
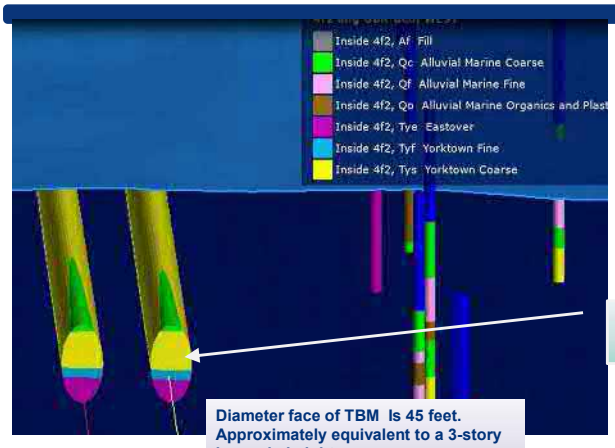
Tunnel Boring Machine / Graphic Representation



14

Boring Transects Multiple Strata Simultaneously

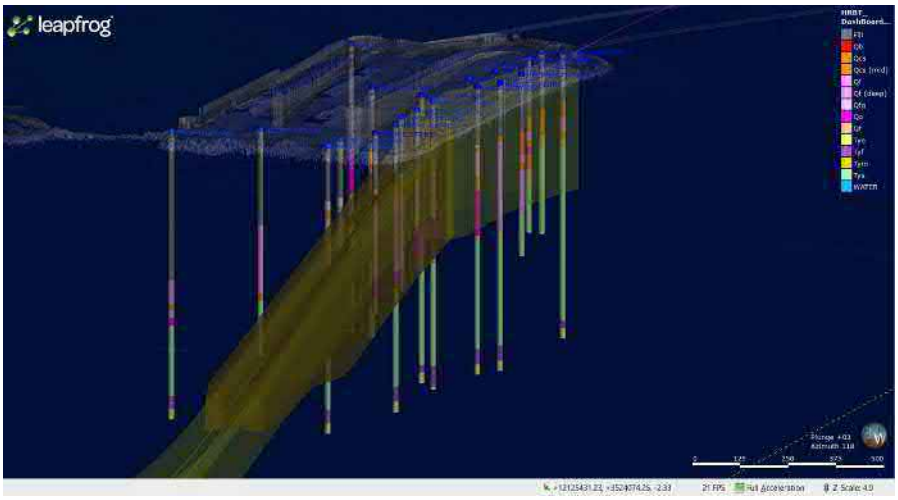


Example figure depicting bore traversing multiple strata as tunnel advances

Diameter face of TBM Is 45 feet. Approximately equivalent to a 3-story house in height.

15

South Island Borings Depicting Soil Stabilization Corridor



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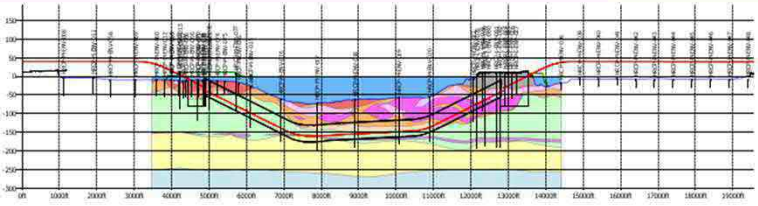
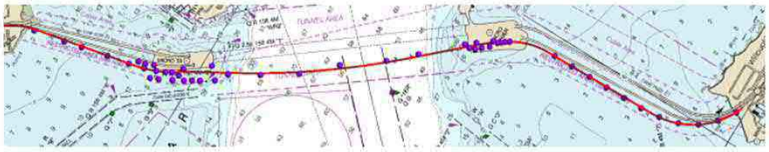
Overall Generalized Cross Section





- Bored Tunnel between existing North and South Islands along a refined alignment

Responsible dept.	Technical reference	Creator DC	Approved by
Legal owner Mott MacDonald		Document type MM Ground Model	Document status Draft for discussion
		Title Proposed ENV BHs	Identification number 507408486
			Rev. / Date of issue 2019/05/16 / Sheet

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Chemical Analysis

- Baseline analytical results for samples from:
  - Elutriate Water
  - Soil/Sediment
  - Amended Bored Material
  - Bench Scale Slurry process water
- Analyte list (following slide)
  - Encompasses an extensive list to provide for background information and basis for future use and/or design parameters
  - QC, Field and trip blanks are to be included

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Overall List of Parameters being analyzed. SAP includes further Details as to which media and purpose

Parameters	Method
Metals (ITM List)	SW846 6020
Mercury	SW846 7471A
Butyltins	Unger Method / Rice 1987
PCB Congeners	SW846 8082
PCB Aroclors	SW846 8082A
Semi volatile Organic Compounds	SW846 8270C
Polynuclear Aromatic Hydrocarbons (PAHs)	
Cyanide	SW846 9012A
pH	EPA 9054D
Nitrate/Nitrite	EPA 353.2
Chlorinated Pesticides	SW846 8081A
Herbicides	SW846 8151A
Volatile Organic Compounds	SW846 8260C
Dioxins/Furans (2,3,7,8-TCDD and 2,3,7,8-TCDF only)	EPA 1613B
Extractrable Organic Halides (EOX)	SW846 9023
TPH - DRO/ORO (C10 to C34)	SW846 8015 D
TPH - GRO (C6 to C10)	
Ammonia (as N)	EPA 350.1
Total Kjedahl Nitrogen (TKN)	SM 4500 Norg_C
Total Phosphorus	SM4500_P_E
Sulfide	EPA 9030B/9034
Potential Acidity	VA Tech method
Neutralization Potential	Neutralization Potential
Acid Base Accounting	Calculation
Calcium Carbonate Equivalence	AOAC 955.01
Pyritic Sulfur (Fizz Rating)	Calculation
Saturated Paste pH & Conductivity	Saturated paste extract
Flashpoint	7.1.2
Paint Filter Test	SW846 9095A
Total Organic Carbon	Lloyd Kahn
Total Solids	SM 2540G
Atterberg Limits	ASTM D4381
Specific Gravity	ASTM D854
Grain Size(Sieve and Hydrometer)	ASTM D422
TCLP Analysis (Includes Volatiles, Semi volatiles, Pesticides, Herbicides, Metals, Mercury, and TCLP	SW846,8260B,8270C,8081A,8151A, 6010B, 7470A, 1311

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Material Management, Beneficial Use/ Disposal

- Material Quantities (estimated)

- Significant volume of material presents beneficial opportunities and potential cost minimization (table below from earlier work – quantities are less than those reported here).

Volume and Type of Material for Disposal

Material Source – Construction Activity	Volume (bulked)
Bored Tunnel Material	968,000 CY
Dredged Material	380,000 CY
Ground Improvement Residuals	400,000 CY
Slurry Wall Residuals	150,000 CY
Excavated soil for the Tunnel Approach Structures (on Islands)	720,000 CY
Trestle Demolition Concrete	59,000 CY
Excavated upland soils from Roadway Construction	23,000 CY
TOTAL	**2,700,000 CY**

The materials management plan (future document) will contain revised quantities and be served by information garnered under this sampling plan.

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