

APPENDIX B

PROJECT DESCRIPTION AND ALTERNATIVE ANALYSIS

INTRODUCTION

The Chesapeake Energy Center (Station), owned and operated by Virginia Electric and Power Company dba Dominion Virginia Power (Dominion), is located in Chesapeake, Virginia, within the Hampton Roads region. The Chesapeake Energy System has been generating electric power for almost half a century to homes and businesses. A shoreline stabilization project at the Chesapeake Energy Center was initiated in 2010 in order to address comments received following an inspection conducted by O'Brien & Gere on behalf of the EPA. The 2010 shoreline stabilization project consisted of improvements to the east and west shorelines of the bottom ash pond/sedimentation pond at the south end of the perimeter shoreline. These improvements were completed in January 2011.

With the decommissioning of the station in mind, planned for December 2014, and EPA inspection comments, Dominion is currently pursuing the necessary repairs for the remainder of the perimeter shoreline. The purpose of the shoreline stabilization project is to stabilize the perimeter shoreline around the Columbia Gas property and dry ash storage facility south of the station, with a long-term, low maintenance solution. The remaining areas requiring repair are known as Priority 1 Area, Priority 2 Area, and Priority 3 Area. The Priority 1 Area, for which this JPA applies, is the section of the east shoreline adjacent to the Columbia Gas facility between the transmission tower and the station. Priority 1 Area shoreline repairs will consist of work to be completed on both Columbia Gas Transmission property and Dominion property. Priority 1 Area been identified as being the area with the most severe erosion and is in need of the most urgent repair.

DESCRIPTION & BACKGROUND

Shoreline stabilization was previously conducted at the Chesapeake Energy Center in 2010. The 2010 work was done on the east and west shorelines of the bottom ash pond/sedimentation pond at the south end of Dominion's property. In order to improve the stability of the east shoreline, sheet piling was installed along a 470 foot long portion of the shoreline. There were no wetlands impacted as a result of the east shoreline improvements. For the west shoreline, a riprap buttress was constructed to improve stability. This portion of the project impacted 3,800 sq. ft. (0.09 ac) of non-vegetated tidal wetlands. On-site, in-kind compensatory mitigation was not feasible due to

area constraints. Therefore, Dominion Virginia Power purchased 0.05 credits from the Libertyville Road Tidal Mitigation Bank. The JPA for the 2010 shoreline stabilization project was submitted on October 15, 2010, and the permit was issued November 18, 2010.

Subsequent to the 2010 work, Dominion is currently pursuing shoreline stabilization in Priority 1 Area. Priority 1 Area at the Chesapeake Energy Center is an approximately 1,000 foot long area on the east side of Dominion's property. The area is bordered by the Elizabeth River to the east and the Columbia Gas property to the west. An asphalt-paved service road runs along the crest of the shoreline in this area. The condition of the shoreline slope below the service road varies. In an approximately 300-foot long section starting at approximately Station 17+50, the upper portion of the slope is near vertical. The remaining sections of the shoreline slope of the perimeter shoreline in the Priority 1 Area range from about 1H:1V to 2H:1V with an average of about 1.5H:1V.

ALTERNATIVES ANALYSIS

Dominion's primary objective for this project is to stabilize the perimeter shoreline in the Priority 1 Area with a long term, low maintenance solution that minimizes environmental impacts. From a regulatory perspective, the primary objective is to identify the least environmentally damaging practical alternative. To ensure that the most appropriate solution was selected, Dominion and their engineering consultant, Schnabel Engineering, considered multiple alternatives for repairing and stabilizing the perimeter shoreline in the Priority 1 Area. Each of the alternatives considered are discussed below. A plan view and cross section view of each of the alternatives is also provided. The alternatives consist of some combination of a flattened slope with and without a sheet pile wall, and erosion and scour protection along the toe of the slope and/or the base of the wall.

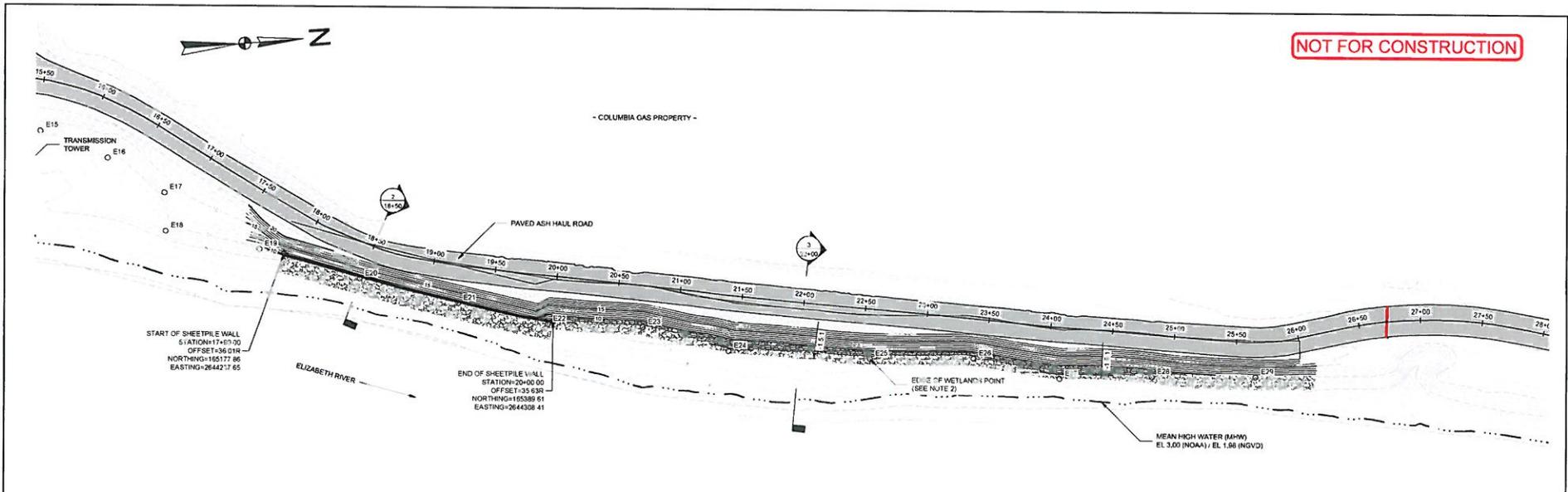
Alternative 1

Alternative 1 consists of re-constructing the existing slope and reinforcing the slope with geogrid to allow a stable 1.5H:1V slope to be constructed. A steel sheet pile wall will be needed to support the 1.5H:1V reinforced slope between Station 17+90 and 20+00. Rip rap will be placed along the toe of the reconstructed slope and below the sheet pile wall between Station 20+00 and Station 26+10 to provide erosion protection along the full length of the repair area. The installation of rip rap below the sheet pile wall will allow the wall to be cantilevered. Approximately 16,500 square feet of wetlands would be impacted by this alternative. (See Figure 1)

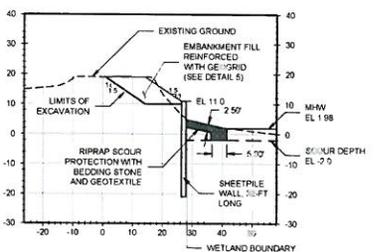
Alternative 1 has the potential to result in non-uniform shoreline conditions, potentially resulting in hydraulic eccentricities that could cause shoreline stability concerns in adjacent areas over time. Additionally, sheet piles have a shorter service life (25-50 years), especially in an industrial environment, and require regular maintenance. Impacts to station operations were also considered during the alternatives evaluation since the station will still be in operation during the construction of the Priority 1 Area improvements. This alternative would require complete closure of the service road along the crest of the shoreline for up to 8 months during construction, resulting in significant hardship to station operations.

Sheet piles do not achieve Dominion's objective of providing a long term, low maintenance solution. In addition, Alternative 1 will adversely affect station operations. Based on the foregoing, Alternative 1 is not a practical option.

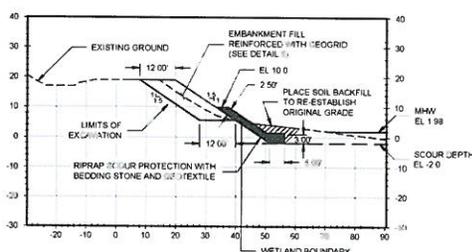
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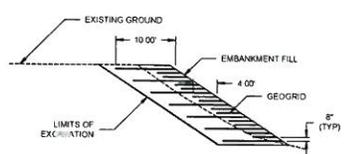
1 ALTERNATIVE 1 - PRIORITY 1 AREA



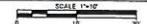
2 SECTION AT 18+50



3 SECTION AT 22+00



5 GEOGRID DETAIL



NOTES

- 1 SURVEY OF EXISTING GROUND SURFACE AND SITE FEATURES PERFORMED BY D&M SURVEYING, INC. OF TAPPANANNOCK, VIRGINIA, DATED JUNE 2011. HORIZONTAL CONTROL IS NAD 83 (2011) VIRGINIA STATE PLANE SOUTH VERTICAL CONTROL IS NGVD 1988.
- 2 WETLANDS SHOWN ON SITE FLAGGED BY MAP BY ENVIRONMENTAL, INC. OF VIRGINIA BEACH, VA ON SEPTEMBER 27 AND 28, 2011 AND SURVEYED BY D&M SURVEYING IN OCTOBER 2011. NOTIFICATION OF PRELIMINARY JURISDICTIONAL DETERMINATION WAS ISSUED ON DECEMBER 7, 2011.



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SHORELINE EROSION REPAIR AND
STABILIZATION
PROJECT NO. 12821022.00

ALTERNATIVE 1 -
PRIORITY 1 AREA

FIGURE 1

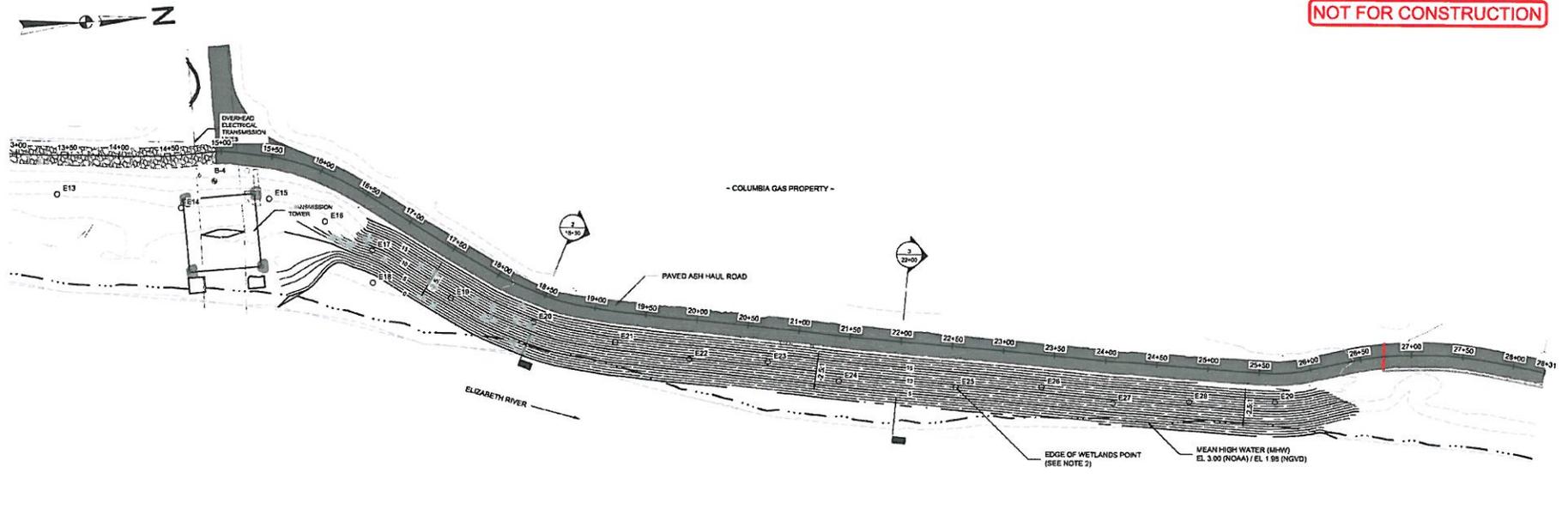
Alternative 2

Dominion proposed Alternative 2 at the initial pre-application meeting on January 29, 2013. Alternative 2 consists of flattening the shoreline slope to 2.5H:1V through a combination of excavation and placement of compacted structural fill. Compacted structural fill will generally consist of soils with greater than 50% sand and less than 50% silt and/or clay. Riprap will be placed over the bottom half of the re-graded slope to provide erosion and scour protection during normal river flows and high river flows resulting from storm events. Riprap and bedding stone will consist of crushed rock. The total area of wetlands to be impacted by Alternative 2 is 32,180 ft² (0.739 acres). (See Figure 2)

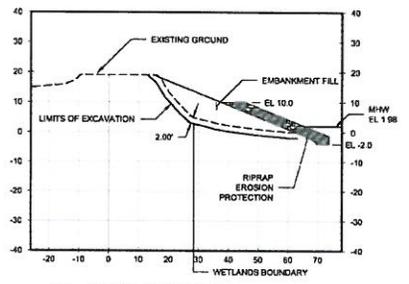
During the January 2013 meeting, regulatory agencies expressed concern over the amount of wetlands impacted by Alternative 2. During that meeting, regulators suggested relocating the service road along the shoreline in order to reduce the wetlands impacted. Since the facility will be maintained upon decommissioning of the plant, the road will be needed into the future. Additionally, the adjacent Columbia Gas property includes a containment structure adjacent to the road and will continue operation after decommissioning. Therefore, relocation of the road to the west is not possible.

Alternative 2 meets Dominions objective of a long-term, low maintenance solution, with the service life being 50+ years and minor maintenance. However, the regulators suggested another alternative that further minimizes environmental impacts, particularly to wetlands.

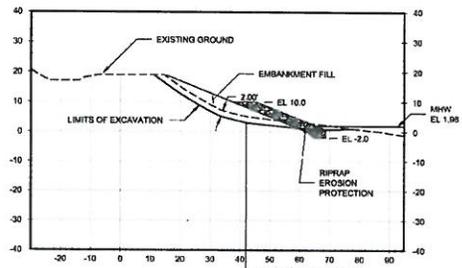
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1 ALTERNATIVE 3 - PRIORITY 1 AREA
SCALE 1"=30'



2 SECTION AT 18+50
SCALE 1"=20'



3 SECTION AT 22+00
SCALE 1"=20'

- NOTES**
1. SURVEY OF EXISTING GROUND SURFACE AND SITE FEATURES PERFORMED BY D&M SURVEYORS OF TAPPANNOCK, VIRGINIA, DATED JUNE 2011. HORIZONTAL CONTROL IS MAD 1927 VIRGINIA STATE PLANE SOUTH. VERTICAL CONTROL IS NGVD 1929.
 2. WETLANDS SHOWN ON SITE FLAGGED BY MAP ENVIRONMENTAL, INC. OF VIRGINIA BEACH, VA ON SEPTEMBER 27 AND 28, 2011 AND SURVEYED BY D&M SURVEYORS IN OCTOBER 2011. NOTIFICATION OF PRELIMINARY JURISDICTIONAL DETERMINATION WAS ISSUED ON DECEMBER 7, 2011.



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ALTERNATIVE 2 -
PRIORITY 1 AREA

FIGURE 2

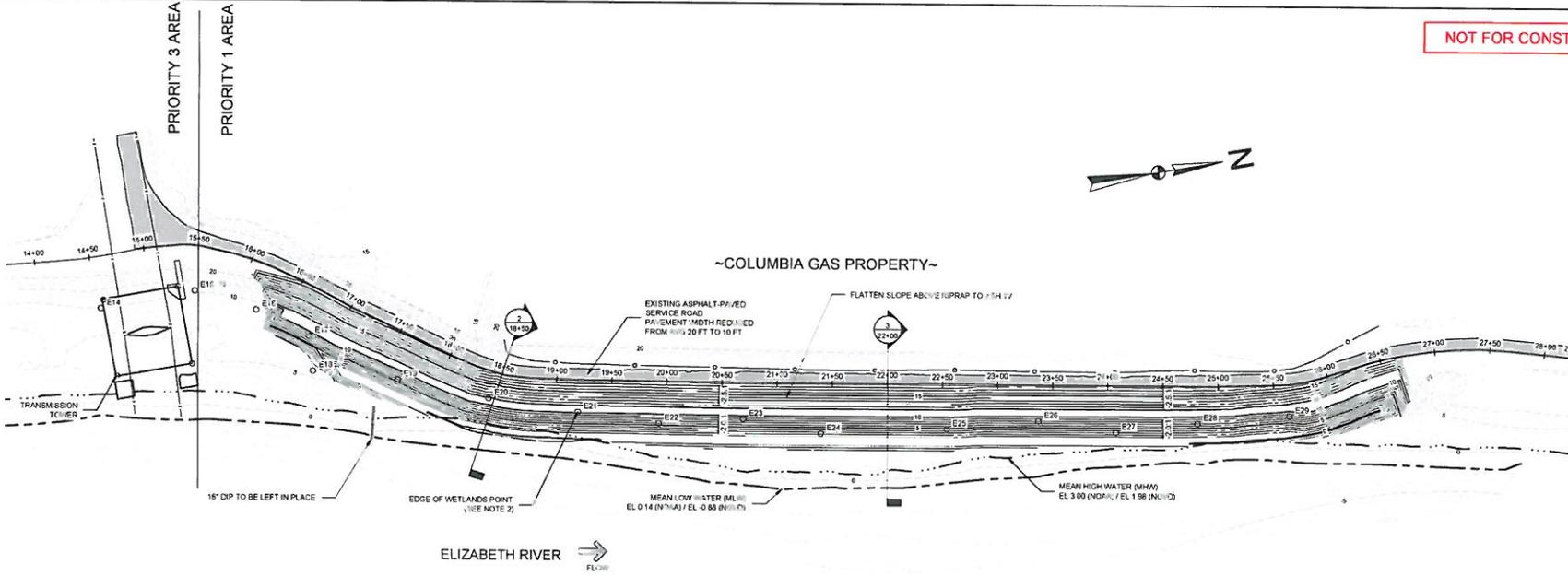
Alternative 3

As discussed in the most recent pre-application meeting on June 6, 2013, significant efforts were made to reduce the impacts associated with Alternative 2. Alternative 3 reflects the results of these efforts. These efforts included reducing the width of the service road along the crest of the dike to one lane, steepening the bottom half of the slope from 2.5H:1V to 2H:1V, and modifying the riprap revetment geometry at the south end of the Priority 1 Area to result in a smaller footprint and a more efficient tie-out of the proposed grading. The total affected area of wetlands to be impacted by the proposed construction is 20,870 ft² (0.480 acres). (See Figure 3)

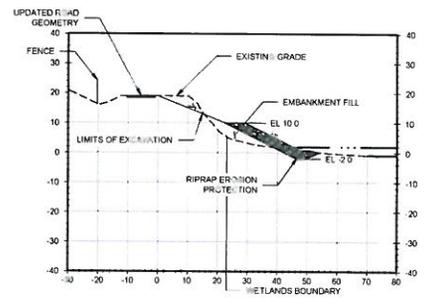
Alternative 3 has a 50+ year service life and low maintenance required. The service road would be closed for a limited period of time decreasing the effects on station operations. Additionally, the Columbia Gas containment area would not be impacted with this alternative. Another advantage of the alternative proposed by Dominion is that uniform shoreline conditions will be re-established after stabilization. Due to the narrowing of the service road, Alternative 3 was able to decrease the amount of impacted wetlands by 11,310 square feet compared to those impacted by Alternative 2.

Since Dominion plans to decommission the Chesapeake Energy Center in 2014/2015, a long term, low maintenance solution is essential. In order to achieve this objective, and satisfy the regulatory objectives, Alternative 3 is the most viable and least environmentally damaging alternative. Alternative 3 requires little maintenance and has a long service life. Alternative 3 also takes into account facility operations and would limit the effect on those operations.

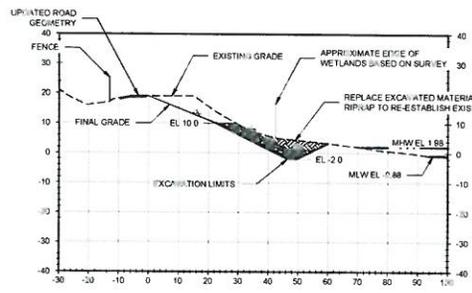
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1 PRIORITY 1 AREA PLAN
SCALE 1"=40'



2 SECTION VIEW STA 18+50
SCALE 1"=20'



3 SECTION VIEW STA 22+00
SCALE 1"=20'

NOTES

- 1 SURVEY OF TOPOGRAPHY AND SITE FEATURES PERFORMED BY D&M SURVEYORS OF TAPPANHANNOCK, VA AND DATED JUNE 2011. HORIZONTAL CONTROL IS NAD 1983 VIRGINIA STATE PLANE SOUTH AND VERTICAL CONTROL IS NGVD 1988.
- 2 WETLANDS SHOWN ON SITE FLAGGED BY MAP ENVIRONMENTAL, INC. OF VIRGINIA BEACH, VA. ON SEPTEMBER 27 AND 28, 2011 AND SURVEYED BY D&M SURVEYORS IN OCTOBER 2011. NOTIFICATION OF PRELIMINARY JURISDICTIONAL DETERMINATION WAS ISSUED ON DECEMBER 7, 2011.



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ALTERNATIVE 3 -
PRIORITY 1 AREA