Attachment 4 of 5
Northrop Grumman Comments on Proposed Amended Record of Decision and Feasibility Study

Review of Natural Resources Assessment

ATTACHMENT 4

to Northrop Grumman Comments on Proposed Amended Record of Decision and Feasibility Study for Northrop Grumman Bethpage Facility and Naval Weapons Industrial Reserve Plant

Review of Natural Resource Assessment

On behalf of Northrop Grumman Systems Corporation (Northrop Grumman), Ramboll was retained to evaluate the adequacy of the assessment of natural resources in the Feasibility Study Report (dated April 3, 2019) and the Proposed Amended Record of Decision (Proposed AROD) (dated May 2019) issued by the New York State Department of Environmental Conservation (NYSDEC).

Our review found that the current FS does not provide sufficient analysis to substantiate comparisons among alternatives and conclusions regarding mitigation of potential impacts on the environment. The qualitative conclusions provided do not represent a sufficient characterization of this required element in an FS. Further, because the Proposed AROD relies upon the current FS to identify Alterative 5B as the preferred remedy, the failure of the FS to provide an appropriate level of evaluation of environmental impacts also means that the recommendation in the Proposed AROD is not adequately supported with regard to this element.

Comments on FS

1) Section 2.5.2, page 11, second para.

The tabulated stream flow information for Massapequa Creek shows that there is substantial variability in flow rates in this system, ranging historically from 0.83 cubic feet per second (cfs) to 57 cfs. Excluding the extreme high and low measurements, the difference between the 25th percentile value (2.6 cfs) and 75th percentile value (9.5 cfs) is more than 3.5-fold. This indicates that dynamic flow rates are routine and relevant to the ecosystem in this basin. A remedial alternative, such as Alternative 5B, that will result in consistent, year-round discharges will limit natural rises and falls in stream level throughout the system, affecting habitat usage such as foraging in shallow, emerging shoreline areas, spawning in low-flow areas and nutrient transport processes related to varying flow regimes.

Reference is also included to Figure 2-3, which includes information from the period of 2006 to 2018. However, since the data plotted on Figure 2-3 include a number of readings from each year, this figure also serves to illustrate directly that the flow variability is seasonal within each year. The graphs indicate that seasonal variation is routinely 5-fold across the year. This information directly demonstrates that a discussion of the substantial seasonal variation should be provided in the FS, along with discussion of the relevance to seasonal variations in the habitat.

2) Section 2.5.2, page 11, third para.

The discussion of characteristics for Bellmore Creek should be expanded to include more information on historical stream flow variability (approximately 10-fold per the range provided). The text should also cross-reference Figure 2-3, which graphs data from 2006-2018 for this system as well. The dynamic nature of the flow regimes and seasonal variability in the range of 5-fold changes in stream flow should be made clear, along with the effects on habitat and use patterns for the system. This degree of flow difference would be expected to result in substantial changes in the shoreline and near shore depths, allowing for varying foraging areas for birds and mammals along the stream. Similarly, this degree of flow change would be expected to generate seasonal pulses of downstream transport of biomass and sediment, providing episodic nutrient pulses that could be relevant to the life history characteristics of downstream populations (e.g., timing of spawning events).

3) Section 3.5.2.2, page 23

This subsection specifies that potential effects on wetlands from each alternative were evaluated only on the basis of modeled changes in the water table due to changes in groundwater flow. While this is a relevant impact that should be considered in each alternative, it is not the only factor related to wetland function and ecological value. Alternative 5B, among other alternatives, will alter surface water flow into the wetlands also, modifying the seasonal occurrence and duration of surface fed (ponded) wetlands.

The conclusions in Section 8 repeatedly assert that wetlands in the various systems are ponded wetlands fed by surface water as a rationale for justifying that water table changes will not be significant to the recharge of the wetlands. By this argument, consideration of surface water inputs to the wetlands is obviously important. The combined impacts of both groundwater changes and surface water changes should be modeled and described for the three Preserves (Massapequa Creek, Seaford Creek, and Bellmore Creek).

For example, in Massapequa Creek, Alternative 5B is expected to increase stream flow and dampen seasonal variation, which could be reasonably anticipated to change the extent and nature of surface-fed wetlands. Conversely, Bellmore Creek is expected to experience reduced stream flow in Alternative 5B, which could dry out wetlands in this Preserve that are fed by surface water. Both of these outcomes could result in substantial reductions in the values of habitat for certain species and changes in ecosystem function. Given the importance of the limited wetland areas on this portion of the south shore, an in-depth, quantitative analysis of wetlands function and communities in both of these systems is necessary to adequately characterize the significance of impacts on the environment from the alternatives.

4) Section 8.9.1, page 112, third para

This subsection states a conclusion that Alternative 5B would have little effect on the environment compared to baseline conditions. However, this conclusion is reached upon consideration of the results of the groundwater flow model developed for the area alone. No specific consideration or modeling of surface water conditions has been included and no Fish and Wildlife Resources Impact Analysis (FWRIA) pursuant to NYSEDEC guidance (DER-10, Technical Guidance for Site Investigation and Remediation, May 2010) has been completed and discussed in the evaluation of alternatives. DER-10 provides a specific decision tree with regard to the need for an FWIRA (Appendix 3) and our review of the decision points indicates that several conditions are met in the stream preserve and coastal estuarine systems that would trigger the requirement for an FWRIA (detailed in comment on the corresponding sections below).

In light of the occurrence of preserves, the lack of a survey for listed species and the variety of upland, wetland and estuarine habitats, only an in-depth quantitative analysis is sufficient to support conclusions about potential environmental impacts. Considering solely the groundwater model predictions is insufficient to support conclusions in the evaluation of alternatives.

5) Section 8.9.1, page 113, second para

This paragraph presents a conclusion that the stream flow changes related to Alternative 5B will likely be a benefit to the Massapequa Creek system and not adversely affect the Bellmore Creek, Seaford Creek and Seaman's Creek systems. However, no specific or quantitative analysis is provided to substantiate these conclusions.

The projected increased flow of 1.2 cfs in Massapequa Creek is represented to be advantageous to local aquatic habitat without any type of specific, quantitative analysis. Key factors not addressed include the continuous nature of the discharge replacing the natural seasonal variations in the system related to precipitation patterns. Compared to the seasonal low flow of approximately 2 cfs observed most years (Figure 2-3), an increase of 1.2 cfs represents more than a 50% increase in flow during the low water season. A qualitative assertion that this is advantageous is not ecologically valid and overlooks the value of exposed and shallower habitat areas during low flow seasons.

Similarly, the projected decreased flow of 1.2 cfs in Bellmore Creek is characterized as small when this would be a 50% decrease in flow in the system. Loss of half the flow in a system on a continuous, long-term basis is not an impact that can be reliably assumed to be insignificant on a qualitative basis.

To appropriately evaluate the alternatives and reach technically substantiated ecological conclusions, a comprehensive, quantitative analysis is required. This should be completed pursuant to NYSDEC guidance as an FWRIA. Rare NYS Ecological Communities and rare and endangered plants are already documented in Massapequa Preserve (Cashin Associates 2009, Town of Oyster Bay: Massapequa Creek Watershed Management Corridor Restoration Plan), wetlands are clearly present, urban and other terrestrial habitat are present, and no survey of listed species has been completed. According the FWRIA Decision Key (DER-10, Appendix 3C), this leads to the decision point that an FWRIA should be completed.

6) Section 8.9.1, page 113, third para

This paragraph presents a conclusion that the limited water table changes predicted by the groundwater model would not result in changes in the hydration of wetland areas sufficient to produce adverse effects. The rationale provided is that the wetlands are flooded or ponded due to surface water inputs, not groundwater recharge. Where this is actually the case, it points directly to the relevance of a comprehensive, quantitative analysis of surface water conditions, particularly the interference with natural seasonal patterns. No technically substantiated conclusion about the wetlands can be based on the type of qualitative rationale provided.

This additional analysis should specifically address the disruption of natural hydrogeologic flow patterns and the transfer of groundwater between surface water drainage basins. The centralized treatment facilities included in Alternative 5B would result in the pumping of water from beneath the Bellmore Creek, Seaford Creek and Seaman's Creek basins and subsequent discharge as surface water in the Massapequa Creek basin. In the current analysis, the only factor included in the alternatives evaluation is the change in stream flow rates. However, transfer of water between hydrogeological units can also have impacts in other ways, particularly changing the relative potentiometric gradients regionally and changing the rate of infiltration or recharge from groundwater in localized areas around stream beds.

Further, no detailed analysis of the depth to the water table throughout the preserves and estuarine areas is provided to show that there is a substantial vadose zone that would not significantly vary with the degree of water table change projected. Since groundwater does appear to discharge to Massapequa Creek (TBD, EMAGIN to provide), the water table apparently intercepts the base of this stream, at least in some areas. A potentiometric surface analysis of the areas throughout Bethpage State Park, the creek preserves and the estuarine areas is required in order to allow comprehensive evaluation of the potential impacts of water table changes on the wetlands.

7) Section 8.9.1, page 113, fourth para

This paragraph presents a conclusion that the predicted changes in groundwater discharge into the saltwater would not affect the position of the saltwater-freshwater interface. However, the values presented represent overall overage input and do not address the potential for localized saltwater intrusion. Modeling results also document that in the area south of New York American Water Company Well 7M, interface would move inland approximately 5,000 feet. A more comprehensive evaluation of potential saltwater intrusion is required to support conclusions regarding the alternatives.

8) Section 8.9.5, page 115

Impacts and disruptions to ecosystems are not discussed in this section and would be expected to occur, particularly relating to the construction of the 10-acre recharge basin in Bethpage State Park. The FWRIA Part 3 should include assessment of potential disruption related to the construction of the recharge basin and the permanent loss of 10-acres of forested habitat. The use of Bethpage State Park by listed species should be considered specifically with regard to potential impacts and mitigation measures. Further, the generalized ecosystem function and value of the forested area to be converted to a recharge basin should be evaluated quantitatively.

While a 10-acre area can be represented as relatively small in a qualitative narrative, given the characteristics of Bethpage State Park, this area could represent a significant amount of unmanaged woodland habitat. The multi-use nature of the park and extensive pathways of the mowed and maintained areas, especially the long corridors of the golf courses that serve to create isolated habitat islands, mean that a 10-acre wooded area could have relatively high habitat value in this setting. This should be evaluated in an appropriate FWRIA approach and considered specifically in describing the impacts of construction of the discharge basin and the permanent loss of forested area.

9) Section 9.1, page 120, first para.

In the absence of a combined groundwater and surface water model to characterize potential wetland impacts and an appropriate, quantitative FWRIA addressing the upland, riparian preserves and coastal estuarian areas, the statement that Alternatives 5A and 5B are the most protective of the environment is not adequately supported by a technical analysis. The rationale provided is that partial discharge of treated water would mitigate potential impacts to surface water, wetlands and subsea discharge. However, to make the stated conclusion that these are the most protective, it would be necessary to show through some type of specific analysis that the conditions would not be demonstrably degraded compared to baseline conditions. Without such analysis, a qualitative conclusion that the disrupted seasonal availability and use of habitat in Massapequa Preserve would be more of an impact than the mitigating factors can offset is just as valid as the current conclusion claiming Alternatives 5B to be among the most protective of the environment. This is why additional, specific analysis is required.

Comments on Proposed AROD

10) Section 1, page 2, third para.

The proposed AROD and preferred remedy are specified to be based upon the FS completed in April 2019. However, as described in comments on that document, it is incomplete and insufficiently quantitative in its evaluation of potential environmental impacts for the alternatives. Decisions cannot currently be supported by an appropriately comprehensive FS and should be deferred pending completion and consideration of a combined comprehensive groundwater/surface water model and interactions, field surveys of ecological communities and an appropriate FWRIA pursuant to NYSDEC guidance (DER-10).

11) Section 7, page 11, first para.

The proposed AROD includes a heading explaining that the FS included consideration of the groundwater model developed for the area. This section does not identify the limitation that there is not currently a corresponding comprehensive model of surface water conditions included in the FS. In particular, the interaction between surface water and groundwater changes expected in association with the alternatives is not considered in a comprehensive, quantitative way beyond identifying average changes in stream flow. This limitation should be discussed. Upon completion of supplemental evaluations of the environment, a heading should be added covering the surface water and ecological modeling and consideration of the FWRIA as included in an updated AROD.

12) Section 7.5, page 18, fourth para.

This paragraph states that an FWRIA was deemed not to be necessary based upon the resources and pathways identified. This conclusion is not substantiated and does not appear to be correct based upon the specifications of the FWRIA Decision Key (DER-10, Appendix 3C). Decision Point 3 (presence of listed species) cannot be answered completely due to the lack of a comprehensive survey. However, rare and endangered plants, including Barratt's sedge, button sedge, whip nutrush, St. Andrew's cross and the only New York state occurrence of false china root, are already recognized to make use of specialized habitats in Massapequa Preserve (Cashin Associates, 2009). This information alone is sufficient to yield an answer from Decision Point 3 that an FWRIA should be initiated. Further, multiple elements of Decision Point 9 are met, including the presence of tidal and freshwater wetlands, surface water features, urban and terrestrial habitats, and the presence of rare NYS ecological communities, which would also result in a determination to proceed to an FWRIA. On this basis, the conclusion presented in the Proposed AROD is inconsistent with NYSDEC guidance regarding the need for an FWRIA. A comprehensive evaluation including FWRA Parts 1, 2, and 3 (Ecological Effects of Remedial Alternatives) should be completed and considered in decisions regarding a preferred remedy.

13) Exhibit D, page 17, fourth para.

This paragraph states that the USGS groundwater flow model was the single quantitative analysis used to reach a conclusion about minimizing possible environmental effects. This is an insufficient basis for technical information to substantiate this overall conclusion. Comprehensive, quantitative evaluation of groundwater/surface water interactions via surface water modeling that accounts for seasonal variation and habitat usage is also necessary, along with an ecological survey and FWRIA.

14) Exhibit D, page 17, fifth para.

This paragraph attempts to substantiate the conclusion that the water table changes associated with groundwater pumping and the stream flow changes associated with removal of water from some creeks (Bellmore Creek, Seaford Creek, Seaman's Creek) and addition of continuous, non-seasonally dynamic

flow to Massapequa Creek are not significant to the environment. However, only a brief summary of averaged values is included.

The discussion does not make clear that considered on the basis of seasonal changes, under low flow conditions the changes in stream flow could amount to a 50% change for Massapequa Creek. And, even using the averaged numbers, the flow rate change in Bellmore Creek would represent only half of natural stream flow for this system.

The information relied upon to substantiate the preferred remedy decisions is currently insufficient from an ecological perspective and comprehensive, quantitative analyses of the effects of stream flow regime changes should be completed and addressed in the Proposed AROD summary of the preferred alternative.

15) Exhibit D, page 18, first para.

This paragraph states that the each of the evaluated alternatives would produce only very minor environmental impacts with regard to saltwater intrusion. However, no quantitative basis or parameters are provided to characterize "minor" impacts and the information presented in the FS only addresses overall areawide averaged conditions. The potential for localized areas of saltwater intrusion extending some 5,000 feet established in models illustrates that an areawide overview is not sufficient detail to explain the saltwater intrusion potential of the preferred alternative.