RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
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SIR COMMENT LETTER October 17, 2014
File No. SR-28-0549D
(Formerly Case No. 2005-059 - Associated with Case No. 97-030)

Mr. Gregory L. Simpson
Project Manager
Textron, Inc.
40 Westminster Street
Providence, RI 02903

RE: Former Gorham Manufacturing Site
Phase II Area- Mashapaug Pond and Cove, Phase III Area - Northeast Upland and Parcel C
333 Adelaide Avenue, Providence, Rhode Island

Dear Mr. Simpson:

The Rhode Island Department of Environmental Management's (the Department) Office of Waste Management (OWM) has reviewed the Site Investigation Report, Former Gorham Manufacturing Site, Phase II Area – Mashapaug Pond and Cove, Phase III Area – Northeast Upland and Parcel C, 333 Adelaide Avenue, Providence, Rhode Island (SIR) for the above referenced property (the Site), which was submitted on November 12, 2013, by AMEC Environment & Infrastructure, Inc. (AMEC) in accordance with Section 7.00 of the Department's Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (the Remediation Regulations).

After careful review of the SIR and related document submittals, the Department requires a response to the attached comments, questions, and concerns about the submittals, which must be fully addressed in writing to receive a Program Letter.

If you have any questions regarding this letter or would like the opportunity to meet with Department personnel, please contact me by telephone at (401) 222-2797, ext. 7109, or by E-mail at joseph.martella@dem.ri.gov.

Sincerely,

Joseph T. Martella II
Senior Engineer
Office of Waste Management

cc: Terrence D. Gray, P.E., Assistant Director, RIDEM/AW&C
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DEPARTMENT COMMENTS
October 17, 2014

Regarding the Site Investigation Report, Former Gorham Manufacturing Site, Phase II Area – Mashapaug Pond and Cove, Phase III Area – Northeast Upland and Parcel C, 333 Adelaide Avenue, Providence, Rhode Island (SIR), prepared by AMEC Environment & Infrastructure, Inc. (AMEC), and dated November 12, 2013, the Department has the following comments and questions:

1. Three separate groundwater plumes of volatile organic compound (VOC) contamination have been identified on the terrestrial upland portion of the former Gorham site and have been documented through testing to be discharging to Mashapaug cove. The Department acknowledges the construction and continued operation of the groundwater extraction and treatment system on Parcel A to address the elevated concentrations of VOCs in the "former Building W" groundwater plume and the "retail building" groundwater plume, and AMEC's belief that the system is providing hydraulic containment of these two VOC plumes. The third VOC plume is referred to as the "western plume" and is located on Parcel C. According to AMEC, the site data indicates that the "western plume" is undergoing biodegradation and demonstrating a trend of decreasing contaminant concentrations over time.

    a. Please be advised of the requirement to continue operation of the groundwater extraction and treatment system on Parcel A, and the monitoring of the "western plume" on Parcel C, during and after the remediation of the cove sediments, at least until such time as it is determined that the upland groundwater contamination no longer poses a threat or risk to the sediments and surface water of Mashapaug cove; and

    b. Due to the nature of the VOC contamination on Parcel A, and the potential for impacts from soil gas on nearby buildings, a determination regarding the need to continue the operation of the groundwater extraction and treatment system, and/or to implement additional or alternative groundwater treatment measures on the two Parcel A plumes, may be made independently of the status of groundwater related impacts to Mashapaug cove sediments and surface water.

2. Textron's preferred Remedial Alternative for the Phase II Area is Alternative 3, removal of approximately 2 feet of impacted inner cove sediment by either Option A (dredging via hydraulic pumping) or Option B (placement of a PortaDam between the inner cove and outer cove, dewatering the inner cove and mechanical excavation of the sediment). The excavated and dewatered sediment will be placed in the former Carriage House portion of the Phase III Area, under an engineered cap. After the sediment removal is completed, the remaining inner cove sediments will be capped by one foot of clean soil, followed by wetland restoration activities.

    a. The SIR indicates that Textron and AMEC will rely on the expertise of qualified

sediment removal contractors to propose the most effective method (Option A or Option B) to remove sediment from the Inner Cove and replace this with clean material based on site-specific conditions. Please be reminded that the sediment removal method must either be selected prior to submittal of the Remedial Action Work Plan (RAWP), or the technical details of both methods must be completely detailed in the RAWP submitted for Department review and approval.

3. Textron's preferred Remedial Alternative for the Phase III Area is Alternative 2, capping of the existing impacted soils in place and capping the excavated and dewatered sediment from the inner cove in the former Carriage House area. The proposed engineered cap will be constructed of a permeable high-visibility marker fabric, placed over the compacted surface soil and impacted sediments, overlain by 12 inches of clean imported topsoil, which will be seeded and maintained.

    a. Additional pre-design sediment sampling was performed during April 2014, to supplement the existing data and further characterize the physical properties of the top two (2) feet of sediment proposed for removal and to evaluate the leaching potential of the dewatered sediment for placement on the Phase III upland area. Based upon the results of that investigation does the dewatered sediment pose a risk of leaching and do the results require any changes to the preferred remedial alternative as proposed?

    b. Please update Figure 5.2 (Proposed Phase III Cap Area), to clearly show the limits of the proposed area where the excavated inner cove sediment will be placed and capped.

4. Textron's proposed remedy for Parcel C is an engineered cap consistent with what is proposed for the Phase III Area, constructed of a permeable high-visibility marker fabric, placed over the compacted surface soil and overlain by 12 inches of clean imported topsoil, which will be seeded and maintained.

5. The SIR has several figures indicating that the general boundary between the inner cove and outer cove is approximately at the narrowest point of the "neck" between the eastern and western peninsulas.

    a. Please include a figure, similar to Figure 5.2 (Proposed Phase III Cap Area), clearly specifying the extent of the proposed inner cove sediment removal area.

    b. At one of the earlier meetings between the Department and Textron, staff from the Department's Office of Water Resources expressed interest in the possibility of including in the proposed sediment removal area several sediment sample locations that appeared to be just outside the inner/outer cove boundary, specifically SED33 and SED34. If these locations are not currently included in the proposed limits of the inner cove sediment excavation, please evaluate the possibility of including these locations.

6. Please update the schedule provided in SIR Section 7.1.6 (Schedule for Remedy Implementation).

The following comments address the November 2013 "Outer Cove" Human Health Risk Assessment (HHRA) submitted by AMEC. The AMEC HHRA updated the July 31, 2006, Supplemental Site Investigation Report (SSIR) in a "streamlined manner, essentially recalculating sediment exposure point concentrations for chemicals of potential concern for the Outer Cove Study Area (expanded from the "Outer Cove" identified in the 2006 SSIR) and using a ratio approach to calculate cancer risks for the Outer Cove Study Area." The 2006 Mashapaug Cove HHRA "evaluated potential future industrial/commercial worker and current/future trespasser exposures and risks associated with potential contact (incidental ingestion and dermal contact) with surface water and sediment of the Inner Cove and Outer Cove." By comparison, the 2013 "streamlined" update states that "the [existing] perimeter fence to prevent access [from trespassers] will no longer be necessary [and that in the future] people entering the City-owned property would no longer be trespassers, but rather site visitors."[1] From a practical perspective, therefore, future site visitors now replace the 2006 adolescent and adult "trespasser" scenario-instead of fencing people out, the park will now be a draw to individuals and families.

Outer Cove HHRA Comments:

Mashapaug Cove consists of two coves—the Inner and Outer Coves, with the northern border of the Outer Cove defined by the property's "approximate site boundary". The AMEC 2013 SIR summarizes "all surface water sample data" used in the HHRA in Tables 4.1, 4.2 and 4.3. These tables present data for 12 "Outer Cove" and "Outer Cove Study Area/Remainder of the Pond" surface water samples taken by AMEC in 2011 and 15 surface water samples collected by MACTEC in 2006 (described below). Of the 2011 surface water samples taken in the "Outer Cove" (SW-33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 59 and 60), none (0/12) were tested for VOCs (including vinyl chloride which was detected in 10/12 Inner Cove surface water samples), semi-volatile organic compounds (SVOCs), dioxins or furans; SVOCs, however, were infrequently detected in "Inner Cove" surface water samples, while several dioxins/furans were detected in the limited number (N=2) of Inner Cove surface water samples taken (Table 4.1). In one "Outer Cove Study Area/Remainder of the Pond" sample (SW-11)—which is a Mashapaug Pond sample taken outside of, but near the "Outer Cove" site boundary, located central to the channel—cis-1,2-dichloroethene (10.8 µg/L, the highest concentration found anywhere in the Cove), trichloroethene (TCE), 4,4'-DDT, 1,2,3,4,6,7,8-HpCDD, and octachlorodibenzo-p-dioxin (OCDD) were detected.

In the 2006 SSIR, 15 surface water samples were taken and are shown in Table 1 (2006 SSIR).

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[1] The November 2005 MACTEC SIR Work Plan described future visitors of Mashapaug Cove to include "potentially any visitors to the Park Parcel such as neighborhood or other local residents (all age groups), high school students and employees (if the school is built), clients and employees of the proposed YMCA facility (if it is built), maintenance personnel for the Park Parcel, perhaps local recreational anglers, and possibly boaters/canoers (http://www.dem.ri.gov/programs/benviron/waste/gorham.htm). Depending on the reason for their visit and the final design of the proposed Park and its walking trail, receptors might have varied exposures to soil, sediments, and surface water." Also, 1) prior to construction of the perimeter fence, homeless people were found to be frequenting/living on the shoreline of the cove and the consumption of fish caught by anglers was a concern to both RIDEM and HEALTH, and 2) "historically, the RIDEM/RIDOH advisory (Stakeholder letter and Do's and Don'ts Flyer, 2002 re: fecal coliform, cyanobacteria and PCBs/dioxin in fish) [was] not completely effective in preventing direct contact recreational uses of the cove such as wading and swimming (2006 SSIR)".

Of these, three (SW10, SW11 and SW12) were located in the "Outer Cove Study Area/Remainder of the Pond," outside of the Outer Cove's identified "site boundary" property line, and 12 were located within the Inner Cove—none were located in the Outer Cove itself. Regarding sediment data, VOCs, SVOCs, dioxins and furans were found in shallow sediment (0-1 ft) samples from the "Outer Cove Study Area", Table 4.5. However, only 4 of 22 "Outer Cove Study Area" samples (2006 and 2011 combined) were analyzed for VOCs and SVOCs, and their frequencies of detection ranged from 1 to 3 out of the 4 samples. In addition, none of the remaining 18 combined sediment samples (SED-33 through SED-48, SED-59 and SED- 60) were analyzed for pesticides or PCBs; presumably as these contaminants were detected at low frequencies in shallow sediment Inner Cove samples.

7. AMEC's "streamlined" HHRA equates the "trespasser receptor" with "future site visitors". Since the 2005 MACTEC SIR defines "future visitors" to include neighborhood/local residents from "all age groups", does AMEC believe that the "streamlined" human health risk assessment presented to the Department adequately addresses behavior patterns and exposure assumptions (detailed in the 2006 SSIR—e.g., age groups, skin surface areas, exposure frequencies, lack of age-dependent adjustment factors for mutagenic carcinogens such as benzo(a)pyrene [BaP] and vinyl chloride) that would be associated with repeat site visits by young children, adolescents and adults? Please explain.

8. It appears that only 3 surface water samples (SW10, SW11 and SW12) were used to calculate Exposure Point Concentrations for the Outer Cove—however, no actual "Outer Cove" surface water data, except for metals, were used to evaluate human health risks for receptors during swimming or wading in the Outer Cove itself. Since samples SW10 and SW12 are clearly located in the "Remainder of the Pond" and not central to or in the "Outer Cove" itself (at locations where receptors may be exposed through dermal contact, for example) a more conservative estimate of VOC surface water concentrations, for example, could be obtained by averaging SW11 sample data with surface water samples taken centrally and closest to the transition point between the Inner and Outer Coves—i.e., SW16, SW17 and SW27. Similarly, while only 1 of 3 "Outer Cove Study Area/Remainder of the Pond" samples was tested for dioxins/furans—and this one data point appears to have been used in the analysis presented to the Department in 2006—the uncertainty associated with relying on this one sample may be reduced by including data from other potentially relevant samples (e.g., SW27) and used in the calculation for incidental ingestion while swimming, for example. Alternatively, new samples could be taken in the "Outer Cove" to characterize current conditions and potential surface water concentrations that site visitor receptors might be exposed to through incidental ingestion while swimming or dermal contact. Please advise.

9. The statement presented in the 2013 AMEC report (pg. 4-3) that "For surface water samples collected from the Outer Cove Study Area and the Remainder of the Pond, cis 1,2-DCE was the only chlorinated VOC that was detected" is somewhat misleading since 1) TCE was also detected at SW11, 2) none of the 12 actual "Outer Cove" surface water samples were analyzed for chlorinated VOCs, and 3) only 3 (SW10, SW11 and SW12) of 9 "Outer Cove Study Area/Remainder of the Pond" samples were analyzed for

chlorinated VOCs. Interestingly, SW-11 which had the highest concentration of cis 1,2-DCE (10.8 ug/L) reported anywhere in the pond (including the Inner Cove) is located centrally (along the channel), just outside the Outer Cove's "site boundary". Also, surface water samples taken closest to the transition point between the Inner and Outer Coves—i.e., SW-16, SW-17 and SW-27—all had detectable levels of vinyl chloride. Considering these facts—and that the majority of "Outer Cove" and "Outer Cove Study Area/Remainder of the Pond" surface water samples (SW-33 through 48, 59 and 60) were collected for the purposes of evaluating "the transfer of total and dissolved metals (PP13) from the sediment to the surface water" (AMEC; November 18, 2011)—the summary statement by AMEC on pg. 5-6 of the 2013 report (i.e., "In summary, the RME and CT ELCR…values for the Trespasser [assuming this is also meant to extend to future site visitors]…for the Outer Cove meet the Remediation Regulation risk limits") does not appear to be based on a robust data set.

10. "Outer Cove" surface water data for the carcinogen 1,4-dioxane do not exist—1,4-dioxane has been associated with 1,1,1-trichloroethane (TCA) and other chlorinated solvents at contaminated sites. When surface water samples were tested for 1,4-dioxane, laboratory reporting limits were given as 500 µg/L. [Note: Also, reporting limits as high as 5,000 µg/L for 1,4-dioxane were shown in the March 2014 groundwater monitoring site status report submitted by Shaw Environmental, Inc. These analyses, however, were conducted to determine compliance with a calculated on-site GB groundwater objective of 2,574 mg/L.] If additional surface water samples are taken, it would be desirable to test for 1,4-dioxane (with lower detection limits), or alternatively, use ½ the detection limit in cumulative risk calculations under the presumption that 1,4-dioxane is present along with TCE in the surface water. Another option would be to test select on-site groundwater monitoring wells (with lower detection limits) for the presence of 1,4-dioxane. Please advise.

11. Limited "Outer Cove" organics sediment data (VOC, SVOC) exist. Increased confidence in contaminant distributions could be gained if additional sediment samples were taken from near-shore/relevant exposure point "Outer Cove" locations where future park visitor receptor activities (swimming, wading, canoeing) are anticipated/more likely to occur—in the past, for example, the potential for a boat/canoe launch area along the eastern shore of the Outer Cove was mentioned. If the potential for receptors to come in direct contact with shoreline sediments exists, then these areas should also be characterized. Also, please 1) clarify which surficial sediment samples (form Figure 4.9, for example) were used to calculate the mean and 95% UCL concentrations shown in Table 5.1 (Table 4.5, for example, presents a mean As concentration of 16.4 ppm vs. 4.4 ppm shown in Table 5.1), and 2) show the actual calculations for a traditional Method 3 risk assessment approach rather than the shorthand "ratio approach" described in footnotes (4) and (5) of Table 5.1.

12. Existing surface water and sediment data present a somewhat incomplete picture of potential contaminant distributions and exposures (during swimming/wading) that may occur in the "Outer Cove". Some of the conclusions drawn appear to be based on inferences made from small sample data sets or data sets that were located outside of the

"Outer Cover" approximate site northern boundary (Fig. 3.3, for example). As noted, past risk communication efforts were not entirely effective "in preventing direct contact recreational uses of the cove such as wading and swimming (2006 SSIR)". To increase confidence in the 2013 AMEC risk assessment conclusions, a brief, revised report that addresses the comments contained herein would be helpful. Such an effort should 1) clearly identify all "Outer Cove" sample data used in the calculation of exposure point concentrations (currently somewhat confusing), 2) "be consistent with scientifically acceptable risk assessment practices…" (Rule 8.04, Remediation Regulations)—by using updated information/data such as age-specific adjustment factors (ADAFs) for mutagenic carcinogens, updated oral slope factor for the carcinogenic effects of TCE, for example, and 3) identify and support the use of scientifically credible exposure variables/assumptions (RME/CTE) for relevant site visitor receptor activity scenarios (USEPA RAGS Part E, 2004 Supplemental Guidance for Dermal Risk Assessment, "Estimation of Dermal Exposures to Chemicals in Water/Sediment", for example).

13. Mashapaug Pond covers 114-acres and is the largest freshwater lake in Providence. (http://www.dem.ri.gov/programs/benviron/water/quality/swbpdf/mashpaug.pdf) As such—and with the school and Park Parcel attraction—it is reasonable to anticipate that site improvements will serve as a draw for teenagers, neighborhood/local residents, recreational anglers, boaters/canoers and possibly homeless people. The AMEC 2013 report states that "potentially complete future exposure pathways for humans" include incidental ingestion and dermal contact with surface water and sediment during wading and swimming activities and the potential consumption of fish or other biota from the Cove. As a site visitor could, in addition to swimming, wading, boating, or canoeing, also consume fish from the Outer Cove/Pond, potential cumulative human health risks could be even higher if the risks from these pathways were combined together. Potential contact scenarios, coupled with RIDEM/RIDOH concerns (re: fecal coliform, cyanobacteria and PCBs/dioxin in fish) point to the need for an effective risk communication/management strategy which may include permanent well-placed signage, park patrols and/or flyers, for example. Please advise.

14. As was previously discussed during a telephone conversation regarding the Department's preliminary review of the SIR, post-sediment remediation activities must include plans to collect and analyze confirmatory surface water dioxin samples from the inner cove to support AMEC's conclusion that dioxin surface water human health risks will be reduced to negligible after inner cove sediment remediation is completed.

Regarding the Phase II and III Wetland and Perimeter Wetland Restoration Plan, Former Gorham Manufacturing Facility, 333 Adelaide Avenue, Providence, Rhode Island, prepared by AMEC, and dated February 6, 2014, the Department has the following comments and questions (please note that these comments from the Department's Freshwater Wetlands Program staff were forwarded to Textron and AMEC via email on April 10, 2014):

15. Although this project would be considered exempt under Rules 6.01 and 6.08 of the Wetlands Rules, an Army Corps permit would be needed, meaning the applicant would have to apply separately to Army Corps.

16. With respect to the "Phase 1" work that has been completed, Wetlands would not require the applicant to replant the 50-foot area with shrubs and trees, but would like all of those areas to be clearly designated as "no cut" zones, that would be allowed to re-vegetate in a natural, wild manner free from any cutting or mowing in the future. The applicant may be allowed to replant portions of that area with plants (Smilax, Rosa, etc.) that could work to limit human access to the shore.

17. The applicant should provide detailed plans on the methods proposed to isolate and dewater the cove, with respect to access, timing, and plans to accommodate any aquatic wildlife encountered, for Department review, comment and approval.

Please submit an SIR Addendum that addresses the abovementioned comments on or before November 28, 2014.