February 16, 2022

Richard J. Bourbonnais, PE
Town Engineer
Department of Public Services
Town of South Kingstown
509 Commodore Perry Highway
Wakefield RI 02879

RE: Proposed Development Engineering Review
Matunuck Beach Road Condominiums: Plat 92-2, Lot 56
Matunuck Beach Road
South Kingstown, RI
DiPrete Project #: 2389-002

Dear Mr. Bourbonnais:

DiPrete Engineering has received comments by GZA Environmental, INC dated January 11, 2022 (copy enclosed). We have reviewed these comments and offer the following in response. The original comments are provided in italics with responses in bold.

ENGINEERING HYDROLOGY REVIEW - COMMENTS:

1. According to the HydroCAD model included in the Stormwater Management Report, overflow from "Ex Low Point" (Pond 21) which represents the existing topographic low point (Approximate Elevation 7 ft) located on Plat 92-2 Lot 60 is routed directly to DP-2 (Link 23: Southwest property line) without considering any infiltration or storage volume that would occur as the flow crosses the site. GZA observed a small, vegetated berm built up along the fence present on the southern property line that would likely detain some volume of stormwater runoff. This berm does not appear to be included in the existing hydrologic model (see attached photograph). The flood storage listed in Node 21 only considers storage available on Map 92-2 Lot 60 and not available storage observed by GZA on the site. Additional site survey should be performed to further define the predevelopment stormwater storage volume and infiltration capacity on the applicant’s property and associated off site discharge onto downgradient properties. The additional flood storage should be incorporated into the pre and post development hydrologic analysis.

Additional survey was undertaken to further define the area between the “Ex Low Point” (Pond 21) and the property boundary to the south, as well as subsequent site visits to reexamine the existing hydrology.

The HydroCAD model has been updated to include the additional storage/ infiltration between the “Ex Low Point” (Pond 21) and the southern property boundary, based on the updated topography. This area has been modeled as an additional Pond node (Pond 21a) in the existing HydroCAD model. See revised Stormwater Management Report. A small vegetated berm does appear present along the majority of the southern property boundary/ fence line, however there appears to be no berm present at the lowest point/ location of offsite discharge onto downgradient properties. See updated survey plan (Sheet 4 of the plan set) that supports this finding. The revised model continues to reflect this condition.
2. The existing low point on Map 92-2 Lot 60 is not shown on the Sheet 7, Grading Plan. It should be clarified whether this low point will remain as is or expanded as part of the development. Note: “Low Point A” (Pond 202) in the Post-Development HydroCAD model lists a larger storage area at elevation 7 than “Ex Low Point” (Pond 21) in the Pre-Development HydroCAD model, which suggests that this storage area will be expanded in the post development condition. Under the proposed conditions, the outfall culvert pipe invert is designed at elevation 7.35, but the lowest contour shown in the depression storage area is elevation 8. The culvert invert elevation should also be labeled on the design plans.

The plans have been updated to show 1’ contours on all plans. The existing low point on Map 92-2 Lot 60 is now shown on Sheet 7, Grading Plan. The new development proposes to expand the existing 7 contour and increase storage in this vicinity. The revised HyrdoCAD modeling demonstrates the peak flood elevation at “Ex Low Point” (Pond 21) will be reduced in post development conditions for all design storms, indicating a betterment to existing flood conditions.

The plans and contours have been revised accordingly to reflect the existing and proposed ground elevations, the culvert inverts and relationship between them. See revised plans and revised Stormwater Management Report.

3. The contours shown on Sheet 7 do not indicate that stormwater runoff from Piping Plover Drive Station 0+50 to 1+00 or the proposed parking area near the site entrance will flow toward Stormcrete Treatment System A as modeled. The grading should be modified, and a berm should be added along the back of the parking area to ensure that stormwater runoff does not flow south toward abutting properties to be consistent with the hydrologic model.

The driveway entry and road alignment have been relocated to provide adequate sight distance at the entrance. The road grading has also been revised to direct flow to Stormcrete Treatment System A accordingly and the hydrologic modeling has been updated to match. The Stormcrete systems have been revised to reflect a traditional configuration in general compliance with manufacturer recommendations. With respect to the comment regarding Stormcrete Treatment System A, a shoulder has been provided behind Stormcrete Treatment System A to assist in preventing bypass, however it should be noted that stormcrete is credited with a 240in/hr infiltration rate and therefore bypass is not expected unless intentionally designed/modeled as such. Notwithstanding, any bypass from Stormcrete Treatment System A will be directed to a swale and not into abutting properties. See revised plans and revised Stormwater Management Report.

4. A spot grade highpoint should be added to the proposed grading plan in the area near Piping Plover Drive Station 7+00 to ensure that stormwater flows to the intended BMPs to be consistent with the hydrologic model.

Spot elevations have been provided at the crest locations of Piping Plover Drive as requested. See revised plans.

5. Stormcrete Treatment System A is located adjacent to a proposed slope that is greater than 15%. The slope extends to the existing low point south of Holden Road. The bottom of the system is approximately 20-inches below the proposed asphalt surface. It appears the post development hydrologic analysis does not account for overflow or seepage generated from this system to the
existing low point. The applicant should address how seepage from this infiltration system into the existing low point will be prevented.

The hydrologic model has been revised such that all Stormcrete Treatment systems are modeled with bypass (where applicable) that reflect the revised layout and grading design parameters. The composition and depth of the Stormcrete Treatment systems have been revised such that the bottom of system/ infiltration interface is sufficiently low enough to avoid propagation into any adjacent low areas. To address seepage, a callout has been added to the plans to install an impervious liner to any system sidewall that is adjacent to a slope steeper than 15%. See revised plans and revised Stormwater Management Report.

6. The proposed level spreader is not included in the Post Development HydroCAD model. The hydrologic analysis (HydroCAD model) shows that post development stormwater discharge velocity generated from proposed “Low Point A” (4.445 fps) will exceed the predevelopment discharge velocities (2.89 fps) from “Pond 21 – Existing Low Point” into downgradient properties. The net velocity increase in post development velocity is anticipated and therefore the applicant has proposed the use of a level spreader to mitigate the post development increase in velocity at the southern property boundary (HydroCAD node: 209 – DP-2 Low Point / SW Property Line). Therefore, the applicant should provide engineering calculations to support the proposed geometry of the level spreader. In addition, the proposed level spreader should be incorporated into the hydrologic analysis to evaluate the effectiveness of the level spreader to reduce post development stormwater flow and velocity at the southern property line (HydroCAD node: 209 – DP-2 Low Point / SW Property Line).

The level spreader has been revised and relocated to match the existing location of the offsite stormwater discharge, based on the additional survey topography and site inspection. The level spreader has been added to the HydroCAD model. The revised model indicates that the level spreader discharge velocity (1.68 fps) will be less than the discharge velocity from the updated “Ex Low Point B” (1.80 fps). Both velocities are considered non erosive. See revised plans and revised Stormwater Management Report.

7. Please provide a copy of the excel sheet used to perform the groundwater mounding analysis for review.

The previously submitted Stormwater Management report provided a mounding analysis for the Stormtech/ Piped Underground Infiltration System. Following redesign, this system provides 4’ or more clearance to seasonal high groundwater table based on the nearest test hole data. Therefore a mounding analysis is not required in accordance with the RISDISM and has been removed from the Stormwater Management Report accordingly. See revised plans and revised Stormwater Management Report.

8. The outlet control device modeling for the 48-inch pipe infiltration system (Pond 207) appears to be incorrect. The weir (device #2) should route to the culvert (device #3) as opposed to both devices routing to primary discharge as is currently modeled.

The 48-inch pipe infiltration system has been revised to reflect typical parameters in accordance with manufacturer’s recommendations. The outlet control device modeling has been revised to route the weir (device #2) to the culvert (device #3). See revised plans and revised Stormwater Management Report.

9. Portions of the property are located within a Federal Emergency Management Agency (FEMA) Special Flood Hazard Area (SFHA). SFHA are defined as the area that will be inundated by the
flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-
percent annual chance flood is also referred to as the base flood or 100-year flood. Areas of the
property are located in Zone AE, in which the flood elevation of 100-year flood has been
calculated to be at elevation 13-feet above Mean Sea Level (MSL). GZA’s review of the Permitting
Submission Set determined that fill associated with site grading, the construction of the roadway
and stormwater infiltration systems will be placed within the 100-year flood plain. The applicant
should prepare and submit an analysis of the pre and post development flood plain impacts in
accordance with the CRMCs Rules and Regulations Governing the Protection and Management
of Freshwater Wetlands in the Vicinity of the Coast.

The existing and proposed topography indicate the site will have an unrestricted hydraulic
connection to the flood plain in both pre and post conditions, at several locations. As this is a
coastal (tidal) floodplain, an analysis of flood plain impacts is not deemed required.

10. On sheet 10 of the design plans the plane view of the “Underground Infiltration System” shows
seven rows of pipes, but Section A-A shows 5 rows. The number of rows should be clarified.

The 48-inch pipe infiltration system has been revised to reflect typical parameters in
accordance with manufacturer’s recommendations. The plans, details and HyrdoCAD model
have been updated accordingly. See revised plans and revised Stormwater Management Report.

11. On pages 2 and 8 of the “Stormwater Systems Operation and Maintenance Plan” references to
the Massachusetts Department of Environmental Protection should be replaced with references
appropriate for the State of Rhode Island and the Town of South Kingstown.

The Stormwater Systems Operation and Maintenance Plan has been updated accordingly. See
revised Operation and Maintenance Plan.

12. The “Stormwater Management Report” states that “Where native soil has an infiltration rate
less than that of sand in the infiltration areas, native soil is to be excavated and filled with ASTM
33 sand or equivalent material to meet the infiltration rate of 8.27 in/hr for all infiltration areas”.
This note should be included on the “Permitting Submission Set” details.

Notes have been revised and/ or added to the plan set providing clarification of the backfill
process below all infiltration systems. See revised plan set.

13. The area between the proposed condominium units and the southern property line is proposed
to be developed as a lawn area with planting bed. This area is currently covered with brush. This
change in groundcover will result in increased runoff onto downgradient properties as no Best
Management Practices (BMP) are proposed in this area.

See response to Comment #1. A small vegetated berm appears present along the southern
property boundary/ fence line. A callout has been added to Sheet 7 Grading Plan that the
existing berm/ swale is to be maintained for full extents of property boundary/ contractor to
tie in to existing topography before/ at toe of berm. This will ensure stormwater runoff will
continue to be directed to the same design points as shown in the existing conditions model.
Since the proposed model results show a reduction in both peak flow and volume for all
design storms for Design Point 2, and Design Point 3 discharges to the coastal floodplain, the
results indicate that the change in cover type will not cause detrimental impact to the
abutting properties. See revised plans and revised Stormwater Management Report.
14. **GZA did not have any comments on the OWTS design.**

Acknowledged.

Please, feel free to contact me if you have any further questions regarding this matter.

Sincerely,
DiPrete Engineering Associates, Inc.

Brett Dellit  
Senior Project Engineer  
bdellit@diprete-eng.com

*Enclosure*
January 11, 2022
File No. 34997.00

Richard J. Bourbonnais, PE
Town Engineer
Department of Public Services
Town of South Kingstown
509 Commodore Perry Highway
Wakefield RI 02879

Re: Proposed Development Engineering Review
Matunuck Beach Road Condominiums: Plat 92-2, Lot 56
Matunuck Beach Road
South Kingstown, Rhode Island

Dear Mr. Bourbonnais:

As requested by the Town of South Kingstown, GZA has prepared this memorandum to summarize our engineering review of the Master Plan and Preliminary Plan Submittal for the proposed Matunuck Beach Road Condominiums Development prepared by Diprete Engineering.

GZA reviewed the following documents that were included in the Preliminary Plan Submittal:

- Permitting Submission Set: Matunuck Beach Condos, dated October 22, 2021, by Diprete Engineering (Design Plans)
- Soil Erosion and Sediment Control Plan, dated June 22, 2021, by Diprete Engineering
- Stormwater System Operation and Maintenance Plan, dated June 22, 2021, by Diprete Engineering
- Abutter’s video submissions 1, 2 and 3.
- Plan Narrative and Supporting Material, dated July 27, 2020, by Diprete Engineering

GZA has reviewed the design of the proposed development’s stormwater management and on-site wastewater disposal systems and the effects of stormwater runoff generated from the proposed development on local hydrology and watersheds. Our review is based on the proposed development projects compliance with the Rhode Island Department of Environmental Managements (RIDEM) Stormwater Management, Design, and Installation Rules: Effective 11/13/2018, Coastal Resources Management Program-Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast, Effective 02/17/2011 and the RIDEM Rules Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of Onsite Wastewater Treatment Systems, Effective 12/28/2021.
Summary of Proposed Development

The applicant is proposing to construct a twelve (12) unit residential condominium complex in the form of six (6) duplex structures as depicted on the Site Layout Plan (Sheet 6 of 14) provided in DiPrete’s Permitting Submission Drawing Set referenced above. As summarized in DiPrete’s July 27, 2020, Plan Narrative and Supporting Material, 25% (3 units) of the proposed units will be designated as affordable housing. Access is proposed to be provided via a private roadway extending from the parcel’s lot frontage located on Matunuck Beach Road. The applicant has proposed to manage stormwater through the installation of several stormwater management features located on the eastern and western portions of the site. The development is proposed to be serviced by public water. An Onsite Wastewater Treatment System (OWTS) equipped with advanced treatment for nitrogen removal is proposed for each duplex unit (6-OWTS total).

The property consists of approximately 4.77 acres of which approximately 0.5 acres is located in a CN (Commercial Neighborhood) Zoning District and the remainder is located within the R20 (Medium High Density Residential) Zoning District. The site is located within the CRMC Carrying Capacity Overlay District, Potter Pond Archeological District and CRMC Salt Pond Region Special Area Management Plan (SAMP). The site is located within the CRMC Carrying Capacity Overlay District, Potter Pond Archeological District and CRMC Salt Pond Region Special Area Management Plan (SAMP). The site is located within the CRMC Carrying Capacity Overlay District, Potter Pond Archeological District and CRMC Salt Pond Region Special Area Management Plan (SAMP). The site is abutted by Residential Properties to the North and South, a Salt Marsh to the East and Matunuck Beach Road to the West. Approximately 1.88 acres of the site are wetland areas. The site is listed as Plat 92-2, Lot 56 in the South Kingstown Tax Assessor’s Database. The owner of the property is Matunuck Beach Road Partners, LLC with a listed address of 80 Sunset Boulevard, Narragansett, RI, 02882. The preliminary plan application package was prepared by DiPrete Engineering and the applicant is listed as Matunuck Beach Road Partners, LLC

Engineering Hydrology Review

GZA’s review of the proposed development’s Preliminary Plan identified the following concerns:

1. According to the HydroCAD model included in the Stormwater Management Report, overflow from “Ex Low Point” (Pond 21) which represents the existing topographic low point (Approximate Elevation 7 ft) located on Plat 92-2 Lot 60 is routed directly to DP-2 (Link 23: Southwest property line) without considering any infiltration or storage volume that would occur as the flow crosses the site. GZA observed a small, vegetated berm built up along the fence present on the southern property line that would likely detain some volume of stormwater runoff. This berm does not appear to be included in the existing hydrologic model (see attached photograph). The flood storage listed in Node 21 only considers storage available on Map 92-2 Lot 60 and not available storage observed by GZA on the site. Additional site survey should be performed to further define the predevelopment stormwater storage volume and infiltration capacity on the applicant’s property and associated off site discharge onto downgradient properties. The additional flood storage should be incorporated into the pre and post development hydrologic analysis.

2. The existing low point on Map 92-2 Lot 60 is not shown on the Sheet 7, Grading Plan. It should be clarified whether this low point will remain as is or expanded as part of the development. Note: “Low Point A” (Pond 202) in the Post-Development HydroCAD model lists a larger storage area at elevation 7 than “Ex Low Point” (Pond 21) in the Pre-Development HydroCAD model, which suggests that this storage area will be expanded in the post development condition. Under the proposed conditions, the outfall culvert pipe invert is designed at elevation 7.35, but the lowest contour shown in the depression storage area is elevation 8. The culvert invert elevation should also be labeled on the design plans.

3. The contours shown on Sheet 7 do not indicate that stormwater runoff from Piping Plover Drive Station 0+50 to 1+00 or the proposed parking area near the site entrance will flow toward Stormcrete Treatment System A as modeled. The grading should be modified, and a berm should be added along the back of the parking area to ensure that stormwater runoff does not flow south toward abutting properties to be consistent with the hydrologic model.
4. A spot grade highpoint should be added to the proposed grading plan in the area near Piping Plover Drive Station 7+00 to ensure that stormwater flows to the intended BMPs to be consistent with the hydrologic model.

5. Stormcrete Treatment System A is located adjacent to a proposed slope that is greater than 15%. The slope extends to the existing low point south of Holden Road. The bottom of the system is approximately 20-inches below the proposed asphalt surface. It appears the post development hydrologic analysis does not account for overflow or seepage generated from this system to the existing low point. The applicant should address how seepage from this infiltration system into the existing low point will be prevented.

6. The proposed level spreader is not included in the Post Development HydroCAD model. The hydrologic analysis (HydroCAD model) shows that post development stormwater discharge velocity generated from proposed “Low Point A” (4.445 fps) will exceed the predevelopment discharge velocities (2.89 fps) from “Pond 21 – Existing Low Point” into downgradient properties. The net velocity increase in post development velocity is anticipated and therefore the applicant has proposed the use of a level spreader to mitigate the post development increase in velocity at the southern property boundary (HydroCAD node: 209 – DP-2 Low Point / SW Property Line). Therefore, the applicant should provide engineering calculations to support the proposed geometry of the level spreader. In addition, the proposed level spreader should be incorporated into the hydrologic analysis to evaluate the effectiveness of the level spreader to reduce post development stormwater flow and velocity at the southern property line (HydroCAD node: 209 – DP-2 Low Point / SW Property Line).

7. Please provide a copy of the excel sheet used to perform the groundwater mounding analysis for review.

8. The outlet control device modeling for the 48-inch pipe infiltration system (Pond 207) appears to be incorrect. The weir (device #2) should route to the culvert (device #3) as opposed to both devices routing to primary discharge as is currently modeled.

9. Portions of the property are located within a Federal Emergency Management Agency (FEMA) Special Flood Hazard Area (SFHA). SFHA are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. Areas of the property are located in Zone AE, in which the flood elevation of 100-year flood has been calculated to be at elevation 13-feet above Mean Sea Level (MSL). GZA’s review of the Permitting Submission Set determined that fill associated with site grading, the construction of the roadway and stormwater infiltration systems will be placed within the 100-year flood plain. The applicant should prepare and submit an analysis of the pre and post development flood plain impacts in accordance with the CRMCs Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast.

10. On sheet 10 of the design plans the plane view of the “Underground Infiltration System” shows seven rows of pipes, but Section A-A shows 5 rows. The number of rows should be clarified.

11. On pages 2 and 8 of the “Stormwater Systems Operation and Maintenance Plan” references to the Massachusetts Department of Environmental Protection should be replaced with references appropriate for the State of Rhode Island and the Town of South Kingstown.

12. The “Stormwater Management Report” states that “Where native soil has an infiltration rate less than that of sand in the infiltration areas, native soil is to be excavated and filled with ASTM 33 sand or equivalent material to meet the infiltration rate of 8.27 in/hr for all infiltration areas”. This note should be included on the “Permitting Submission Set” details.
13. The area between the proposed condominium units and the southern property line is proposed to be developed as a lawn area with planting bed. This area is currently covered with brush. This change in groundcover will result in increased runoff onto downgradient properties as no Best Management Practices (BMP) are proposed in this area.

14. GZA did not have any comments on the OWTS design.

If you have any questions or require additional information, please do not hesitate to contact Ryan DaPonte at (401) 741-4514 or ryan.daponte@gza.com

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Ryan DaPonte, P.E.              Igor Runge, Ph.D., P.H.  
Project Manager               Project Reviewer  

Todd Greene, P.E.              
Associate Principal

Attachments:  Limitations
              Site Photograph

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USE OF REPORT

1. GZA GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of our Client for the stated purpose(s) and location(s) identified in the Proposal for Services and/or Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not expressly identified in the agreement, for any use, without our prior written permission, shall be at that party’s sole risk, and without any liability to GZA.

STANDARD OF CARE

2. GZA’s findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Proposal for Services and/or Report and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. Conditions other than described in this report may be found at the subject location(s).

3. GZA’s services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made. Specifically, GZA does not and cannot represent that the Site contains no hazardous material, oil, or other latent condition beyond that observed by GZA during its study. Additionally, GZA makes no warranty that any response action or recommended action will achieve all of its objectives or that the findings of this study will be upheld by a local, state or federal agency.

4. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the Report.

SUBSURFACE CONDITIONS

5. The generalized soil profile(s) provided in our Report are based on widely-spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then become evident, it will be necessary to reevaluate the conclusions and recommendations of this report.

6. Water level readings have been made, as described in this Report, in and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this report. Fluctuations in the level of the groundwater however occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities, and/or natural or artificially induced perturbations. The observed water table may be other than indicated in the Report.

COMPLIANCE WITH CODES AND REGULATIONS

7. We used reasonable care in identifying and interpreting applicable codes and regulations necessary to execute our scope of work. These codes and regulations are subject to various, and possibly contradictory, interpretations. Interpretations and compliance with codes and regulations by other parties is beyond our control.
SCREENING AND ANALYTICAL TESTING

8. GZA collected environmental samples at the locations identified in the Report. These samples were analyzed for the specific parameters identified in the report. Additional constituents, for which analyses were not conducted, may be present in soil, groundwater, surface water, sediment and/or air. Future Site activities and uses may result in a requirement for additional testing.

9. Our interpretation of field screening and laboratory data is presented in the Report. Unless otherwise noted, we relied upon the laboratory’s QA/QC program to validate these data.

10. Variations in the types and concentrations of contaminants observed at a given location or time may occur due to release mechanisms, disposal practices, changes in flow paths, and/or the influence of various physical, chemical, biological or radiological processes. Subsequently observed concentrations may be other than indicated in the Report.

INTERPRETATION OF DATA

11. Our opinions are based on available information as described in the Report, and on our professional judgment. Additional observations made over time, and/or space, may not support the opinions provided in the Report.

ADDITIONAL INFORMATION

12. In the event that the Client or others authorized to use this report obtain additional information on environmental or hazardous waste issues at the Site not contained in this report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this evaluation, may modify the conclusions stated in this report.

ADDITIONAL SERVICES

13. GZA recommends that we be retained to provide services during any future investigations, design, implementation activities, construction, and/or property development/redevelopment at the Site. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.