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July 20, 2018
GZA File No. 03.0033554.60

Mr. Neal Personeus
Rhode Island Department of Environmental Management (RIDEM)
Office of Water Resources
235 Promenade Street,
Providence, Rhode Island 02908

Re: RIPDES Construction General Permit Application
WQC File 16-171 & RIPDES File No. RIR101477
Response to RIDEM Request for Additional Information dated March 30, 2018
Proposed Liquefaction Facility Project
642 Allens Avenue/121 Terminal Road
Providence, Rhode Island

Dear Mr. Personeus:

GZA GeoEnvironmental, Inc. (GZA) has prepared this letter, on behalf of National Grid LNG, LLC (NGLNG), in response to the Rhode Island Department of Environmental Management (RIDEM) Office of Water Resource's Request for Additional Information dated March 30, 2018 (the "RIDEM Letter") related to the construction of the proposed liquefaction facility (the "Project") at 642 Allens Avenue/121 Terminal Road in Providence, Rhode Island (the "Site"). The RIDEM Letter requests clarification of certain items in NGLNG's September 12, 2016 and April 4, 2017 application packages for authorization to discharge stormwater under the Rhode Island Pollutant Discharge Elimination System (RIPDES) Program. To facilitate your review, the RIDEM Letter's comments are provided below in **bold** followed by GZA's responses in *italics*.

This letter is subject to GZA's limitations in **Appendix A**. The RIDEM Letter is in **Appendix B**.

The Project is located in the north-central portion of the Site. A Locus Map is presented on **Figure 1** of the Permit Plan Set (dated June 28, 2018) provided in **Appendix C**. This Permit Plan Set specifically addresses the comments in the RIDEM Letter.

Comment #1:
Please ensure that the submitted stormwater management analysis, calculations and the Stormwater Management Plan are stamped by a R.I. professional engineer. Please describe how the calculations of percent (%) impervious were derived to compute the overall % impervious of the site relative to the definition of redevelopment in the Rhode Island Stormwater Design and Installation Standards Manual (RISDISM). Please indicate the accuracy of the methods used and if the data was field verified.

Response: The stormwater management analysis, calculations and the Stormwater Management Plan are stamped by a R.I. professional engineer. GZA designed the proposed stormwater treatment system that consists of a lined sand filter and a sediment forebay (for pretreatment). Plans of this system stamped by a R.I. professional engineer are in the Permit Plan Set. The proposed stormwater conveyance system was designed by Kiewit Engineering and Design Corporation (Kiewit). Design plans of the conveyance system, which are also

*stamped by a R.I. professional engineer, are provided in **Appendix E**. A hydraulic analysis of the stormwater management system (the combined treatment and conveyance systems) was conducted by GZA using HydroCAD 10.00 modeling software. A hydraulic analysis for only the stormwater conveyance system performed by Kiewit was provided in the September 12, 2016 submittal. A copy of the analysis and calculations, which have been stamped by a R.I. professional engineer, is attached as **Appendix D**. To illustrate existing and proposed Site conditions, GZA has also prepared an additional **Figure A**-Pre-Development Watershed Map and **Figure B**-Post-Development Watershed Map. These two figures are included in **Appendix E** and consolidate information from the various Kiewit plans in an easier to read format.*

*The percent impervious areas were calculated using information from Class I/III surveys and field verification of the existing Site conditions by GZA personnel. Field verification consisted of Site visits during rain events to observe runoff patterns. The areas presented below were measured using AutoCAD software from the indicated figures. As defined by the RISDISM, a redevelopment project is any construction, alteration, or improvement that disturbs a total of 10,000 square feet or more of existing impervious area. The total area of existing impervious cover that will be disturbed by the Project is depicted on **Figure A** and was measured to be 35,080 square feet using AutoCAD software. To qualify as a redevelopment project, the percentage of groundcover at the Site that is impervious must be greater than 40%. The existing impervious area for the Site (937,856 square feet) represents approximately **51.88%** of the entire Site (1,807,725 square feet) and is more than 40%. The impervious cover at the Site was calculated using existing ground cover maps, land survey information, flown aerial imaging, and observations made by GZA personnel during Site visits. Areas with buildings, asphalt pavement, concrete structures, metal structures, etc., were identified as existing impervious. Vanasse Hangen Brustlin, Inc. (VHB) performed a Class I/III land survey of the Site in 2014. This survey included the existing structures (as impervious area) and was used as the base for the Permit Plan Set. Areas with crushed stone or gravel were evaluated during Site visits to distinguish between compacted (to be treated as impervious) and not compacted (pervious). **Figure 3** of the Permit Plan Set depicts the existing impervious cover at the Site and calculation of the overall percent impervious cover, based on the above information.*[1]

Comment #2:
Please provide a stormwater analysis of the proposed design for the 1.2" 24-hour type III storm event (water quality storm) using the modified curve number method found in section 3.3.3.2 of the RISDISM. Please also provide an analysis for the 10-year storm event.

*Response: Stormwater analyses for various storm events using HydroCAD 10.00 modeling software are provided in **Appendix D**. The HydroCAD analyses reports include the 1.2-inch 24-hour Type III storm event (water quality storm) as well as the 1-year 2.7-inch 24-hour Type III, 10-year 4.9 inch 24-hour Type III, and 25-year 6.1-inch 24-hour Type III storm events as defined in the RISDISM. Results indicate that the proposed sand filter and sediment forebay capture and treat the runoff volume associated with the 1.2-inch as well as the 2.7-inch storm events without directing runoff to the overflow bypass. Given that the stormwater treatment system does not result in bypass flows for the 1.2-inch or more importantly, 2.7-inch storm events, we believe using a modified curve number (CN) method will provide little additional information. The modification technique applied to the 1.2-inch storm event will minimally increase the CN to generate a larger runoff volume estimate. This increase will be much smaller than runoff generated by a 2.7-inch storm event, which is accommodated by the proposed stormwater treatment system.*

[1] *Note, since our original application submittal, portions of the Site have been capped with asphalt pavement or other impervious cover under separate approved permits. As shown in **Appendix C**, these modifications have been incorporated into the Permit Plan Set (dated June 28, 2018).*

Comment #3:
Please include an existing and proposed condition sub-watershed map following the guidance in Appendix K of the RISDISM. Please clearly depict all new impervious areas. Also, clearly depict and separately identify all existing impervious cover to be redeveloped. Please note that all areas of gravel and crushed stone are to be considered impervious and require water quality treatment based on the RISDISM. Please depict sufficient grading detail to substantiate flow directions.

Response: ***Figure A****-Pre-Development Watershed Map and* ***Figure B****-Post-Development Watershed Map in* ***Appendix E*** *were prepared in accordance with the guidance in Appendix K of the RISDISM. Existing impervious areas that will be disturbed and areas that will be redeveloped are shown on* ***Figure A.*** *Portions of the Site are currently covered with un-compacted crushed stone (i.e., areas of crushed stone that are not driven on or compacted in any way). These areas are treated as existing pervious areas. Under existing grading conditions, drainage areas 1 through 8 have no discernable flow direction or discharge location. The existing drainage areas are relatively flat and due to the un-compacted crushed stone, stormwater infiltrates in these areas.*

For clarity, redevelopment areas refer to existing impervious areas that will be redeveloped with impervious areas, requiring treatment of 50% of the runoff. According to the RISDISM, new impervious areas (over existing pervious cover) require 100% treatment. As indicated in our original application, the redevelopment area for the Project is 8,219 square feet, which results in a water quality volume of 343 cubic feet. The new impervious area for the Project is 54,454 square feet and results in a water quality volume of 4,538 cubic feet. Together, these two areas result in the total required water quality volume of 4,881 cubic feet. All of the new impervious area is located in areas that are currently un-compacted crushed stone, which we are treating as pervious area. If these un-compacted crushed stone areas were to be treated as impervious, then the redevelopment area for the Project would be 62,673 square feet (all of this area would only require treatment of 50% of the runoff) and the resulting water quality volume would be only 2,611 cubic feet. Based on our observations during precipitation events of the existing un-compacted crushed stone areas at the Site, we believe these areas should be treated as pervious, hence the larger water quality volume.

Proposed final grading and surface details (including proposed impervious areas) are depicted in ***Figure B*** *of* ***Appendix E.*** *As shown in* ***Figure B,*** *drainage areas 1 through 11 are directed to the treatment system. These areas will be surfaced with a combination of asphalt, concrete, and compacted gravel. Drainage areas 1, 10, and 11 will also contain small sub-areas of un-compacted crushed stone. Areas of gravel that will receive vehicle and equipment traffic and are treated as impervious and areas of un-compacted crushed stone that are treated as pervious are also depicted in* ***Figure B.*** *Drainage areas 12 and 13 will not drain to the stormwater treatment system, the runoff from these areas will not receive treatment. Although runoff from drainage areas 12 and 13 cannot be treated, according to the hydraulic analysis for the 1.2-inch storm event, the sand filter captures and treats 5,072 cubic feet of stormwater, which is greater than the required water quality volume of 4,881 cubic feet.*

Comment #4:
Provide water quality treatment for all areas of new gravel and crushed stone cover. If any areas of crushed stone cover can be demonstrated to be low traffic areas which will not be subject to long-term compaction by vehicles, provide a technical justification that will support not providing these areas with the required water quality treatment.

Response: Water quality treatment for all areas of new impervious gravel/stone is provided. Under the proposed conditions, portions of the limit of work will consist of un-compacted crushed stone similar to the existing conditions. These pervious areas will not be subject to vehicular traffic or any other means of compaction. Vehicular and equipment traffic will be allowed only on specifically designated access roads (compacted gravel or asphalt), which

are considered to be impervious. We believe these 'no-traffic' crushed stone areas should be treated as proposed pervious areas over existing pervious area and will not require stormwater management. Please refer to Figure 13 in the Permit Plan Set in ***Appendix C*** *and* ***Figure B*** *in* ***Appendix E****, which differentiates between areas of un-compacted crushed stone (pervious areas) and compacted gravel (impervious areas).*

Comment #5:
Please explain why the proposed condition impervious area within drainage areas 12 and 2 are not directed to the proposed water quality management practice.

Response: Drainage area 12 consists of the proposed riprap armoring for the elevated platform and is not expected to produce a significant amount of runoff due to infiltration through the riprap. Drainage area 12 (and area 13 as well) cannot be modified to direct stormwater to the treatment system. However, as stated above, the stormwater treatment system will capture and treat more than the required water quality volume generated during a 1.2-inch storm event. Drainage area 13 is directed to the existing sump at the Site.

Proposed drainage area 2 is directed to catch basin CB-106, which ultimately discharges to the treatment system. ***Figure B*** *provides the depiction. The post-development watershed map (provided by Kiewit in our September 12, 2016 submittal) depicted the access road as a crowned roadway. As a result, a portion of the access road was shown as draining away from the stormwater management system. As depicted on the attached* ***Figure B****, the access road will not be crowned. Rather, it will be graded to direct runoff to the treatment system. This portion of the access road has been incorporated into drainage area 1.*

Comment #6:
Please provide a drainage diagram (node diagram) as part of the submitted drainage analysis. Please include the flow split node in the diagram.

Response: The node diagram, which includes the flow split node, for post-development conditions is provided in the HydroCAD analysis report included in ***Appendix D****.*

Comment #7:
Please refer to Appendix H.3: Water Quality Goals and Pollutant Loading Analysis Guidance for Discharges to Impaired waters, "Stormwater Compensation Method". The receiving waters are mapped as having impairments for fecal coliform, dissolved oxygen, and total nitrogen. The Proposed design involves a proposed sand filter that will be lined and under drained, with a discharge to the receiving waters.

- **To adequately address fecal coliform impacts in instances where total infiltration of the water quality volume associated with new impervious cover is not being proposed, the "stormwater Compensation Method" calls for treatment of 100% of the new or increased impervious cover plus a compensatory treatment on a 1:1 basis. Therefore, to adequately treat for fecal coliform the proposed sand filter must be sized for a water quality volume of 343cf to account for the redevelopment area, the 4,538 cf to account for the new impervious area, plus an additional 4,538cf to account for a 1:1 compensation area. Therefore, the required design water quality volume for treatment of runoff to the fecal coliform-impaired waters would be 9,419 cubic feet (cf).**
- **To adequately address total nitrogen impacts in instances where total infiltration of the water quality volume associated with new impervious cover is not being proposed, the "Stormwater Compensation Method" calls for treatment of 100% of the new or increased impervious cover plus a compensatory treatment on a 1.5:1 basis. Therefore, to adequately treat for total nitrogen the proposed sand filter must be sized for a water quality volume of 343cf to account for the redevelopment area, the 4,538 cf to account**

for the new impervious area, plus an additional 6,807cf to account for a 1.5:1 compensation area. Therefore, the required design water quality volume for treatment of runoff to the total nitrogen-impaired waters would be 11,688 cf.

Response: We have reviewed Appendix H.3: Water Quality Goals and Pollutant Loading Analysis Guidance for Discharges to Impaired Waters, "Stormwater Compensation Method". The design of the stormwater treatment system, based on the hydraulic analysis, accommodates the impaired water body compensatory treatment volume. Implications of our review of Appendix H.3 to the design are depicted on ***Figures 10 and 11*** *of the Permit Plan Set and consist of the following:*

- *The width of the weir structure for the sediment forebay is 20 feet; and*
- *The invert elevation of the overflow bypass in the sediment forebay is 9.52 feet (NAVD88).*
- *The diameter of the overflow bypass is 36 inches.*

*As indicated in the attached hydraulic analysis (**Appendix D**), during the 1-year storm event (2.7 inches in 24-hours), the sand filter captures and treats 12,614 cubic feet of runoff without directing stormwater to the overflow bypass structure in the sediment forebay. Therefore, the stormwater treatment system can provide treatment for the water quality volume and additional compensatory volume for both fecal coliform and nitrogen impacts (12,614 cubic feet provided versus 11,688 cubic feet recommended for nitrogen impaired waters).*

Additionally, the proposed liquefaction facility will not contain any sources of pollutants of concern. Vegetation at the existing LNG facility is strictly prohibited, and the proposed liquefaction facility will not include any landscaped areas. Therefore, there will be no anthropogenic sources of nitrogen (from fertilizers) at the proposed liquefaction facility. The proposed liquefaction facility will not include any new septic systems or other onsite sanitary sewer treatment systems and will not provide any sources of anthropogenic fecal coliform.

Comment #8:
Address the evaluation of the proposed outfall and how the drainage of the system is impacted by tidal influences, including impacts to roadway drainage and function of the sand filter with consideration of conveyance of large storms (e.g. 10-year and greater), the precipitation data used in the modeling, evaluation of various peak tides and how future considerations for sea level rise may or may not have been accounted for. Hydraulic model outputs submitted must indicate the hydraulic capacity of the system under large storm scenarios across the range of outfall/tidal influences.

*Response: The invert elevation of the proposed outlet (OU-300) is 4.80 feet (NAVD88). Mean High High Water[2] (MHHW) is at elevation 2.37 feet (NAVD88). Mean High Water (MHW) is at elevation 2.12 feet (NAVD88). Therefore, during normal tide cycles, the outlet will not be impacted by tidal influences as it is located above MHHW. VHB prepared a Technical Report in October 2013 titled, 'National Grid LNG Facility Coastal & Hydraulic Modeling Analysis'. This report analyzed flooding (including wave action and sea level rise) for the proposed liquefaction facility. According to VHB's report, the stillwater flooding elevation for the 10-year flood event (7.0 feet, NAVD88) would completely submerge the outlet pipe (OU-300). The stormwater system was modeled in HydroCAD assuming a 7.0-foot elevation tailwater at outlet OU-300 to evaluate the treatment system during a 10-year flood event. As shown in the attached hydraulic analysis (**Appendix D**), the peak flood elevation in the treatment system during a 25-year precipitation and 10-year flood event was 10.0 feet (NAVD88). The flood elevation of the treatment system is 10.1 feet (NAVD88), therefore the treatment system does not flood during a 10-year flood event and 25-year precipitation*

[2] MHHW and MHW from National Oceanic and Atmospheric Administration (NOAA) Tidal Datums for Station 8454000

event. The precipitation data used in this analysis were the Natural Resources Conservation Service (NRCS) Type III 24-hour 25-year storm event as defined in the RISDISM (6.1 inches). According to VHB's report, the 50-year stillwater flood elevation is 10.1 feet (NAVD88). Therefore, during 50-year flood events or larger, the stormwater treatment system would be submerged. Note, the majority of the proposed liquefaction facility is located at approximate elevation 21.00 feet (NAVD88) and will not flood during a 50-year flood event.

Comment #9:
With respect to the submitted long-term operation and maintenance (O&M) plan, please provide an 8.5" x 11" or 11" x 17" (no larger) map that depicts the location of all the proposed stormwater practices to be maintained.

*Response: The Operations and Maintenance Plan – Liquefaction Plant Stormwater Systems is attached for reference as **Appendix F. Figure 1**-Stormwater System Site Plan, is provided in the Operations and Maintenance Plan – Liquefaction Plant Stormwater Systems. **Figure 1** is 11" x 17" and depicts the location of all the proposed stormwater practices to be maintained.*

Comment #10:
With respect to the submitted long-term operation and maintenance (O&M) plan, please revise the document to include mandatory language (i.e., use "shall" vs. "should") for all required elements of the O & M plan.

Response: Mandatory language has been added in the attached Operations and Maintenance Plan – Liquefaction Plant Stormwater Systems.

Comment #11:
With respect to the submitted long-term operation and maintenance (O&M) plan, please include a section on long-term pollution prevention items. Please refer to Appendix G of the RISDISM for guidance with preparation of this section. Please incorporate project-specific items only (e.g. identify all waste products generated as part of process proposed such as tank bottoms, condensate, truck fueling or cleaning, by-products of the liquefaction process). Identify all storage of hazardous or waste materials, and all wastewaters generated by on site activities.

*Response: The attached long-term Operations and Maintenance Plan – Liquefaction Plant Stormwater Systems included in **Appendix F** includes a long-term pollution prevention section (Section 3.0). Recommendations provided in Appendix G of the RISDISM were used as guidance.*

With respect to the Project-specific proposed liquefaction equipment, both continuous and episodic waste will be generated:

- *During operation of the proposed liquefaction plant, wastewater will be generated continuously from compressed air dryers. This wastewater will be placed into appropriate shipping containers and trucked off-Site for proper disposal at a licensed facility. This wastewater will not be exposed to stormwater.*
- *Waste will be generated episodically during annual shutdown and routine maintenance of the proposed liquefaction plant. These include: used lubricating oils; used thermal fluids; natural gas filter media; absorption media; and natural gas condensate. All waste generated during these maintenance events will be placed into appropriate shipping containers and trucked off-Site for proper disposal at a licensed facility. These wastes will not be exposed to stormwater.*
- *The proposed liquefaction facility will not include any vehicle/equipment fueling or washing/cleaning capabilities, therefore, no pollutants from vehicle/equipment fueling or wash water will be generated.*

- *All of the LNG generated by the proposed liquefaction facility will be stored in the existing LNG tank inside the existing containment dike.*
- *There are no "tank bottom" discharges from the proposed liquefaction facility.*
- *The only chemicals that will be used/processed at the proposed liquefaction facility are natural gas (vapor and liquid phases), lubricating oils, thermal fluid and nitrogen. None of these chemicals will be exposed to stormwater.*

Comment #12:
Please identify how the measures in the proposed soil erosion and sediment control plan will ensure that disturbed areas will be phased and minimized to prevent exposure of disturbed soils to precipitation and how measures will be implemented during intense rain events to ensure sediment is not discharged off-site or to a Water of the State. Please provide an updated SESC plan. The current plan does not propose phasing of the amount of disturbed area and that the project will be completed within 6 months. However, given the project is directly adjacent to the River and will be managing contaminated soils under the RIDEM Office of Waste Management (OWM) APPROVED Short Term Response Action Plan (STRAP), the Department is requiring that the phasing and stabilization plan is revisited to address a phasing sequence that minimizes the area disturbed and sequences temporary or permanent stabilization prior to disturbing more area. In addition, consideration should be given to the need for temporary sediment traps or basins for control of volumes and velocities of larger storms that may overwhelm simple perimeter sediment controls. Please provide a better description of how the contractor will implement section 2.5 of the SESC Plan. Please explain why temporary erosion controls will not be utilized in areas in the interim where the site will be covered with asphalt or crushed stone.

Response: The SESC Plan included as ***Appendix G*** *includes the proposed Project phasing. Additionally, Kiewit's phasing plans are available in* ***Appendix H.*** *The proposed Project phasing will generally consist of the following:*

- *Phase 1: Mobilization*
- *Phase 2: Filling and Installation of Revetment Wall*
- *Phase 3: Pile Installation*
- *Phase 4: Underground Utility Installation*
- *Phase 5: Equipment Concrete Pad Installation*
- *Phase 6: Equipment, Pipe Rack, and Building Installation*
- *Phase 7: Aboveground Process and Piping Installation*
- *Phase 8: Electrical and Instrumentation Installation*
- *Phase 9: Final Surfacing Installation*
- *Phase 10: Sand Filter Installation*
- *Phase 11: Equipment Testing and Site Close Out*
- *Phase 12: Demobilization*

Soil disturbance will occur during phases 2, 3, 4, 9, and 10. The erosion and sediment controls utilized for this Project will be evaluated at the beginning of each phase of work and any additional erosion and sediment controls will be installed as needed. The duration of soil disturbing phases is anticipated to be less than 6 months. During filling activities (Phase 2), erosion control blankets will be installed as needed along the slopes as they are constructed to stabilize soils. The riprap revetment will be installed at the end of Phase 2 to permanently stabilize the slopes of the liquefaction area. During Phases 3 and 4, additional erosion and sediment controls will be installed downgradient of the pile driving location or underground utility excavation as work proceeds. Any stormwater collection or conveyance systems installed during Phase 4 will be equipped with erosion and sediment controls as soon as they are online. The sand filter will be constructed once final surfacing has been installed to prevent the sand filter from

receiving sediment laden runoff from areas of active construction. The overall goal will be to keep the size of disturbed areas at any one time as small as practicable.

Comment #13:
The SESC Plan indicates that on-site catch basins will be protected with silt sacks during construction. For catch basins that serve a significant drainage area, the plan preparer should consider raising the existing structures during construction to ensure stormwater from the open construction or un-stabilized areas does not enter the drainage system. In addition, the Department recommends external inlet protection techniques as they are easier to maintain and are less prone to blinding, preventing flow from entering the system to prevent ponding/flooding. All storm drains that receive drainage from this site and roadways within proximity to the construction site should be protected by an inlet protection device, including storm drains in gravel areas. This measure shall be used where the drainage area to an inlet is disturbed and is not to be used in place of sediment trapping devices. Please specifically refer to and reference the RISESC Handbook Section 6 part 1 pages 1-8 for practice selection criteria.

*Response: New catch basins (depicted on **Figure 6** in **Appendix E**) will be installed with rim elevations at final grade to accommodate the final surface stabilization (asphalt or crushed stone layer). During construction, the rims of these catch basins will protrude above the surrounding subgrade. Therefore, until final surfacing (stone, gravel, riprap, paving, etc.) is installed, stormwater migration into these catch basins will be minimal. Additional protection will be provided by silt sacks and Filtrexx Soxx at each catch basin.*

*All of the existing catch basins and drainage structures (**Figure 4** in **Appendix E**) that are proposed to remain at the end of the Project are located in the temporary laydown area. As described above, the temporary laydown area will be equipped with crushed stone to limit erosion of on-Site soils. The new catch basins and all existing catch basins and drainage structures will be equipped with Filtrexx Soxx in addition to the silt sacks to further protect against accumulation and mobilization of sediment to waters of the State. The SESC Plan references the practice selection criteria in Section 6 of the RISESC Handbook. For further information, please refer to the SESC Plan included in **Appendix G**.*

Comment #14:
Section 2.7 of the SESC Plan indicates that during construction a sediment forebay will be used and will function as a sediment trap. Please provide the calculations for sizing this practice and its effectiveness at removing sediment during construction, as well as and how outlet or discharge will be protected and routed to prevent the discharge of sediment to a water of the state.

Response: Due to phasing, the sediment forebay and series of catch basins and manholes will be constructed prior to final soil stabilization at the Site. Therefore, for a limited period of time during active construction, the sediment forebay may receive runoff from areas of active construction that have not achieved final stabilization. However, as described above, the rim elevations of the new catch basins will be installed at final grade (above surrounding subgrade) and will be equipped with erosion and sediment controls to capture any sediment and debris as soon as they are online. Therefore, we do not expect that the sediment forebay will receive significant amounts of runoff during construction. Additionally, any runoff that does flow to the sediment forebay during construction will have already been filtered through the silt sacks and Filtrexx Soxx, therefore, we expect that runoff entering the sediment forebay will not contain significant amounts of sediment. During active construction, the sediment forebay will serve as a final layer of protection against discharge of sediment laden runoff. The sand filter will be constructed towards the end of the Project and will not receive stormwater runoff from areas of active construction. Depending on the sequence of underground utility installations during Phase 4, a temporary discharge pipe may need to be installed

to convey stormwater runoff from the sediment forebay to Providence River. If this is required, the temporary discharge pipe will be sized to accommodate the 10-year storm event as defined in the RISDISM. The sediment forebay was sized in accordance with the RISDISM to accommodate the water quality volume. The sediment forebay will be inspected and cleaned, as necessary, to ensure operation will be as designed, prior to bringing the sand filter online.

Comment #15:
Please provide a narrative discussion and associated engineering calculations to indicate the outfall is designed to prevent erosive flows at the point of discharge.

Response: The riprap for the riprap apron at outlet OU-300 was sized by Kiewit assuming a maximum discharge velocity of 5.58 ft/sec. Riprap will not be disturbed during this discharge velocity and the apron will provide the necessary energy dissipation to prevent erosion. Calculations for riprap sizing is provided in ***Appendix I****. For reference, the discharge velocity for the 25-year storm event in the HydroCAD analysis report is 3.67 ft/sec; this is less than the design velocity.*

Comment #16:
Section 2.9 of the SESC Plan speaks to stockpile containment. Please revise as necessary to be consistent with and with proper references to the approved STRAP that addresses the management of contaminated soil storage and disposal practices.

*Response: Section 2.9 of the attached SESC Plan (****Appendix G****) is consistent with the RIDEM approved STRAP and STRAP Addendum. Specifically, stockpiles will be equipped with appropriate perimeter erosion and sediment controls to limit soil migration resulting from stormwater erosion. These controls will include the installation of Filtrexx Soxx surrounding the perimeter of the stockpiles. Soil stockpiles must be kept on top of polyethylene sheeting (or NGLNG or environmental professional approved equivalent) and covered with polyethylene sheeting at the end of each work day. Stockpiles will be inspected daily by Site personnel. Any excess soil will be tested prior to removal from the Site and will be taken to an off-site disposal/recycling facility at a licensed facility approved by NGLNG.*

Comment #17:
Section 3.2 of the SESC Plan discusses construction dewatering. It is our understanding that all contaminated groundwater or construction dewatering will be containerized for off-site transport and disposal. Please revise the SESC plan accordingly. Please also modify Section 3.6 of the SESC Plan accordingly.

*Response: Any contaminated groundwater or construction water from any Site activities (including dewatering activities) will be containerized into fractionation tanks and disposed/recycled off-Site at a licensed disposal/recycling facility approved by NGLNG. No construction water (including groundwater) will be discharged (infiltration or otherwise) at the Site. Furthermore, no construction water will be directed to the catch basins or sediment forebay at the Site. During Phase 3, the drill wash water utilized during micro-pile installation will be recirculated. This water will be collected in lined trenches (no infiltration) and reused to advance the pile. Sections 3.2 and 3.6 of the attached SESC Plan (****Appendix G****) are consistent with the approved STRAP and STRAP Addendum.*

Comment #18:
Sheet 6 of 14 entitled Erosion and Sedimentation Plan should be updated to include the following:

1. **Phasing and sequencing**
2. **Where the temporary or permanent erosion control blankets will be applied**
3. **Areas where soil stockpiling will be allowed**
4. **Areas where construction washout practices will be installed**

*Response: The Permit Plan Set in **Appendix C** references the phasing and depicts the soil stockpile and construction washout location as well as areas where erosion control blankets may be implemented. Kiewit's phasing plans are included as **Appendix H**. The areas where soil stockpiling and concrete washouts will occur are shown on **Figure 4** (in **Appendix C**). As described in the SESC Plan (**Appendix G**), erosion control blankets will be implemented as needed during filling activities (Phase 2). The areas where erosion control blankets may be utilized are shown on **Figure 6** (in **Appendix C**). There are no permanent erosion control blankets proposed. Steep slopes around the proposed liquefaction facility will be permanently stabilized with appropriately sized riprap at the end of Phase 2. The riprap slope protection will be installed as the proposed liquefaction area is raised to protect steep slopes from erosion. As a conservative measure, erosion control blankets may be installed to further protect the slopes as needed.*

Comment #19:
Section 3.8 discusses methods of dust control. Please make a direct correlation to the phasing of the project and the amount of soil disturbed and not stabilized at any time. The SESC Plan and the construction plans should contain notes that when water is used for dust suppression, no runoff will be allowed to enter a water of the State or the drainage system that will continue to discharge to a water of the State.

*Response: Please refer to Section 3.8 of the attached SESC Plan (**Appendix G**). Specifically, dust controls will be implemented when visible dust in the air is observed. If excessive dust generation occurs and cannot be reasonably controlled, the job shall be shut down until control is achieved. Air monitoring (including dust monitoring) will be performed in accordance with the RIDEM-approved STRAP and STRAP Addendum for the duration of the Project. Dust control measures will be implemented as needed for the duration of the Project. Dust control measures will consist of appropriate engineering controls (e.g., application of water, calcium chloride, mulching work area, etc.) and/or modifications to work practices. As indicated in the attached SESC plan, the total area that will be disturbed by the Project is 4.07 acres. As depicted in the phasing plans in **Appendix H**, the maximum area that will be disturbed at any given time during construction is 3.2 acres, this represents the area that will be disturbed during Phase 2 Filling and Revetment Wall Installation. When implementing dust control, care will be taken by the contractor to prevent generation of runoff due to Site watering. The SESC plan and construction plans include a note indicating the dust control must not result in runoff discharging to the drainage structures or waters of the State.*

Comment #20:
Please complete Section 7 and submit with this re-submittal. Additional signatures may be submitted once the contractor/operator is selected and before any sub-contractors are brought on-site.

*Response: A completed Section 7 is included in the attached SESC Plan (see **Appendix G**).*

Comment #21:
Please resubmit the following plan sheets at a scale no greater than 1" = 40' in order to conform with Appendix A requirements:

1. **Existing Sheet 2 of 14, existing Conditions Plan dated 3/27/17 (currently at 1" = 80').**
2. **Proposed Final Conditions Drawing No. Figure 13 (currently at 1"- 50').**

*Response: The attached Permit Plan Set in **Appendix C** conforms with the RISDISM Appendix A requirements.*

Comment #22:
Predominant vegetation in pervious areas is not described on Sheet 2 of 14 nor within the report. Please provide this information as required by Appendix A.

*Response: The attached Figures 2, 2A, and 2C of the Permit Plan Set in **Appendix C** identify areas with existing vegetation. As shown on Figures 2, 2C, and 4, an existing Sassafras tree stand is located at the Site. This Sassafras tree stand contains several high caliper trees and are currently protected with permanent fencing and jersey barriers. In addition to the existing fencing, the Sassafras tree stand and surrounding area will be protected with Filtrexx Soxx. The remaining vegetated areas within the limit of work are sparsely vegetated and mainly consist of scrub and invasive species of plants. These areas will be covered with crushed stone during the initial phases of the Project. The crushed stone will limit direct exposure to urban fill soils, stabilize soils, reduce offsite tracking of sediment, provide a level safe work environment, and reduce dust generation at the Site.*

Comment #23:
The Existing Conditions sheet(s) of the plan set does not identify any buffer zones(s) on mandated setbacks. Please update the plans to include all resource buffer and/or setback lines associated with any resources and/or regulations.

*Response: The attached Permit Plan Set in **Appendix C** depicts the 50-foot and 200-foot setbacks/buffers from the Providence River.*

We trust that this letter and attached supporting documentation will address all of RIDEM's comments. If you have any questions or need any additional information, please contact Igor Runge at igor.runge@gza.com or 401-421-4140.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Sara Haupt, P.E.
Assistant Project Manager

Igor Runge, Ph.D., P.H.
Consultant/Reviewer

Margaret Kilpatrick, P.E.
Associate Principal

cc: Mr. William Howard, National Grid
Mr. Anthony LaRusso, National Grid

Appendices:

Appendix A – Limitations
Appendix B – RIDEM March 30, 2017 Comment Letter
Appendix C – Permit Plan Set
Appendix D – HydroCAD Report (stamped by GZA)
Appendix E – Kiewit Stormwater Drainage System Design Plans (stamped by Kiewit)
Figure A Pre-Development Watershed Map (GZA)
Figure B Post-Development Watershed Map (GZA)
Appendix F – Operations and Maintenance Plan – Liquefaction Plant Stormwater Systems
Appendix G – Soil Erosion and Sediment Control Plan
Appendix H – Kiewit's Phasing Plan
Appendix I – Riprap Sizing Calculations (stamped by Kiewit)

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