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February 14, 2017

Via Federal Express/Electronic Mail

Todd Anthony Bianco, EFSB Coordinator
RI Energy Facilities Siting Board
89 Jefferson Blvd.
Warwick, RI 02888

Re: Invenergy Docket No. SB-2015-06

Dear Mr. Bianco:

On behalf of Invenergy Thermal Development LLC ("Invenergy"), enclosed please find (1) an original and 10 copies of Invenergy's redacted Response to the Town of Burrillville's 22nd Set of Data Requests; (2) an original and 1 copy of Invenergy's unredacted and confidential Response to the Town of Burrillville's 22nd Set of Data Requests and (3) Invenergy's Motion for Protective Treatment.

Please let me know if you have any questions.

Very truly yours,

ALAN M. SHOER
ashoer@apslaw.com

Enclosures

cc: Service List

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
ENERGY FACILITY SITING BOARD

IN RE: INVENERGY THERMAL DEVELOPMENT LLC's APPLICATION TO CONSTRUCT THE CLEAR RIVER ENERGY CENTER IN BURRILLVILLE, RHODE ISLAND

DOCKET No. SB-2015-06

INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-1 Under the water plan, is it correct that ammonia deliveries increased from 2 per month to 15 per month, or a 13 truckload per month delivery? That equals 26 new trips to and from the site. Please explain the reasons for the increase and the details.

RESPONSE 22-1 The amount of ammonia anticipated to support the Clear River Energy Center (CREC or Project or Facility) did not change from the May 2016 Traffic Impact Study to the revised Water Supply Plan, filed with the Energy Facility Siting Board (EFSB or Board) on July 11, 2017 (Water Supply Plan or revised Water Supply Plan). However, during a comprehensive review of the trucking option for the Water Supply Plan, Invenergy Thermal Development LLC ("Invenergy") noticed that the assumptions in the May 2016 Traffic Impact Study regarding the number of ammonia deliveries were not correct. The traffic analysis submitted as Appendix E of the revised Water Supply Plan corrected the number of ammonia trucks to approximately 15 per month and confirmed that "the traffic impacts are still minimal."

RESPONDENT: John Niland, Invenergy Thermal Development LLC

DATE: February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
ENERGY FACILITY SITING BOARD

IN RE: INVENERGY THERMAL DEVELOPMENT LLC's APPLICATION TO CONSTRUCT THE CLEAR RIVER ENERGY CENTER IN BURRILLVILLE, RHODE ISLAND

DOCKET No. SB-2015-06

INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-2	Under the water plan, is it correct that Water Filter Bed media turnover introduces 2 new truck trailers on the roadway per month? That equals 4 trips to and from the site per month. Please explain.
RESPONSE 22-2	No, Water Filter Bed media turnover will not introduce 2 new truck trailers on the roadway per month. However, as indicated on page 5 of the Water Supply Plan, Invenergy intends to utilize mobile demineralizer trailers that will require off site regeneration and, "Based on the annual average cycle makeup water demand, this is equivalent to approximately one trailer needing to be regenerated every month." That equals approximately 2 trips to and from the site per month.
RESPONDENT:	Amit Nadkarni, Invenergy Thermal Development LLC
DATE:	February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
ENERGY FACILITY SITING BOARD

IN RE: INVENERGY THERMAL DEVELOPMENT LLC's APPLICATION TO CONSTRUCT THE CLEAR RIVER ENERGY CENTER IN BURRILLVILLE, RHODE ISLAND

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INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-3 Under the water plan, is it correct that Onsite water storage tank increased from 1,000,000 gallons (1 MG) to 2.25 MG? That is a 125% size increase, which in all likelihood, increases the footprint of impervious at the site. Please explain.

RESPONSE 22-3 No, the original application consisted of an approximately 1,000,000 gallon tank for demineralized water and an approximately 800,000 gallon tank for service water/fire water.

The revised configuration consists of an approximately 1,850,000 gallon tank for demineralized water and an approximately 1,050,000 gallon tank for service water/fire water.

This revised volume does not increase the footprint or affect the imperious coverage at the site. The volume increase is achieved by increasing the height of the tank. The diameter of the demineralized water tank was previously stated as 110 feet in diameter and 30 feet tall and is now revised to approximately 85 feet in diameter and 55 feet tall. The height of the service water/fire water tank has been increased from 30 to 49 feet.

RESPONDENT: Amit Nadkarni, Invenergy Thermal Development LLC

DATE: February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
ENERGY FACILITY SITING BOARD

IN RE: INVENERGY THERMAL DEVELOPMENT LLC's APPLICATION TO CONSTRUCT THE CLEAR RIVER ENERGY CENTER IN BURRILLVILLE, RHODE ISLAND

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INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-4	Under the water plan, is it correct that you now propose an Onsite Wastewater Treatment System ("OWTS") to treat wastewater from the office and domestic spaces? Do you agree that this will require an OWTS permit through RIDEM? Is there any potential for treated process wastewater to be introduced to this system? Please explain the details.
RESPONSE 22-4	Yes, Invenergy now proposes an Onsite Wastewater Treatment System (OWTS) to treat wastewater from the office and domestic spaces, and a new OWTS permit is required from the Rhode Island Department of Environmental Management (RIDEM). No process water will be sent to this system as all other plant systems are physically separated and not connected to the OWTS.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
ENERGY FACILITY SITING BOARD

IN RE: INVENERGY THERMAL DEVELOPMENT LLC's APPLICATION TO CONSTRUCT THE CLEAR RIVER ENERGY CENTER IN BURRILLVILLE, RHODE ISLAND

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INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-5	Under the water plan, is it correct that water replenish rate after an oil fired operation event is 11 trucks per day, or 22 trips to and from the site? Is this a guarantee? Please explain.
RESPONSE 22-5	Yes, the traffic impact analysis, Appendix E of the Water Supply Plan assumes that approximately 11 trucks per day will access CREC to replenish the water tanks. This is not a guarantee, but it is a reasonably conservative estimate of the number of trucks per day that are expected. It is difficult to guarantee because there could be weather events or unexpected disruptions that could cause the number of trucks during one day to be less and correspondingly the number could be more on the following day.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
ENERGY FACILITY SITING BOARD

IN RE: INVENERGY THERMAL DEVELOPMENT LLC's APPLICATION TO CONSTRUCT THE CLEAR RIVER ENERGY CENTER IN BURRILLVILLE, RHODE ISLAND

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INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-6	Under the water plan, is it correct that oil replenish rate after an oil fired operation event is 7 trucks per day, or 14 trips to and from the site? Is this a guarantee? Please explain.
RESPONSE 22-6	Yes, the traffic impact analysis, Appendix E of the water supply plan assumes that "approximately 7 trucks per day will access the CREC facility to replenish the oil tank." This is not a guarantee, but it is a reasonably conservative estimate of the number of trucks per day that are expected. It is difficult to guarantee because there could be weather events or unexpected disruptions that could cause the number of trucks during one day to be less and correspondingly the number could be more on the following day.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
ENERGY FACILITY SITING BOARD

IN RE: INVENERGY THERMAL DEVELOPMENT LLC's APPLICATION TO CONSTRUCT THE CLEAR RIVER ENERGY CENTER IN BURRILLVILLE, RHODE ISLAND

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INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-7	Under the water plan, is it correct that you have assumed an oil run event duration for 3 days? What if there is an extended run of this power plant for more than 3 days while running on oil? Do you agree that this would increase the number of truck trips to and from the site during a week's time or longer? Please explain.
RESPONSE 22-7	The quantity of water and oil stored on site would only allow for 3 days of continuous oil fired operations. It is not possible to replenish the tanks at a rate to support continuous oil operations beyond 3 days. Therefore, an extended run for more than 3 days on oil is not possible and the number of truck trips required for replenishment has been correctly addressed in the traffic study.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
ENERGY FACILITY SITING BOARD

IN RE: INVENERGY THERMAL DEVELOPMENT LLC's APPLICATION TO CONSTRUCT THE CLEAR RIVER ENERGY CENTER IN BURRILLVILLE, RHODE ISLAND

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INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-8 Under the water plan, is it correct that the worst case scenario you present is that oil tank depletion (2 MG) will equal 19 trucks per day to replenish, or 38 trips to and from the site? Is this a guarantee? Please explain.

RESPONSE 22-8 The worst-case-scenario presented is a total of 22 trucks per day following an oil fired event as indicated in the traffic analysis, Appendix E to the Water Supply Plan. The analysis assumes approximately 13 water trucks (2 for normal operation and 11 for water replenishment), 7 oil trucks, and 2 additional trucks consisting of either 1 aqueous ammonia truck, 1 wastewater truck or 1 mobile demineralizer trailer.

No, this is not a guarantee but represents a reasonably conservative estimate of the number of trucks per day that are expected. It is difficult to guarantee because there could be weather events or unexpected disruptions that could cause the number of trucks during one day to be less and correspondingly the number could be more on the following day.

RESPONDENT: Amit Nadkarni, Invenergy Thermal Development LLC

DATE: February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
ENERGY FACILITY SITING BOARD

IN RE: INVENERGY THERMAL DEVELOPMENT LLC's APPLICATION TO CONSTRUCT THE CLEAR RIVER ENERGY CENTER IN BURRILLVILLE, RHODE ISLAND

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INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-9	Under the water plan, is it correct that the average truck rate after an oil operation event will be 22 trucks per day new traffic or 44 trips to and from the site? Could this be exceeded? Please explain.
RESPONSE 22-9	As discussed above in Invenergy Response No. 22-8, 22 trucks per day is expected but cannot be guaranteed.
RESPONDENT:	Amit Nadkarni, Invenergy Thermal Development LLC
DATE:	February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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IN RE: INVENERGY THERMAL DEVELOPMENT LLC's APPLICATION TO CONSTRUCT THE CLEAR RIVER ENERGY CENTER IN BURRILLVILLE, RHODE ISLAND

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INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-10	Under the water plan, is it correct that the traffic engineer assumes each truck carries 8,000 gallons per truck but the water host agreement indicates a truck is 7,200 gallons per truck? Do you agree that a recalculation of the traffic engineer's figures are needed, which will increase the truck figures identified above in items 1 through 9? Please explain and provide the recalculation.
RESPONSE 22-10	CREC expects to utilize trucks with an 8,000 gallon volume and the traffic engineer correctly assumed that volume in their traffic analysis. The truck capacity of 7,200 gallons referenced in the water supply agreement with the Town of Johnston was approximate and used for the purpose of generally describing typical operating conditions. It does not represent an obligation on either party. No recalculations are required.
RESPONDENT:	Amit Nadkarni, Invenergy Thermal Development LLC
DATE:	February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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IN RE: INVENERGY THERMAL DEVELOPMENT LLC's APPLICATION TO CONSTRUCT THE CLEAR RIVER ENERGY CENTER IN BURRILLVILLE, RHODE ISLAND

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INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-11	Under the water plan, do you agree that Table 2 of McMahon's traffic report is now underestimated due to estimated tanker truck size, and assumes only a 3-day operation event running on oil, so it technically is not the "worst case scenario"? Please explain.
RESPONSE 22-11	No, the truck count in Table 2 is not underestimated for the reasons explained in responses 22-7 and 22-10. The reference to worst-case scenario is a reference to a scenario where the tanks were depleted. The combination of water, oil and other trucks will be approximately 22 trucks per day to recover from such an event.
RESPONDENT:	Amit Nadkarni, Invenergy Thermal Development LLC
DATE:	February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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IN RE: INVENERGY THERMAL DEVELOPMENT LLC's APPLICATION TO CONSTRUCT THE CLEAR RIVER ENERGY CENTER IN BURRILLVILLE, RHODE ISLAND

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INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-12	Under the water plan, is it correct that Johnston's signed agreement is dated 1/6/17 by the Mayor, which is 4 days before the Johnston Town Council authorized the Mayor to enter such an agreement with Invenergy? Do you believe this agreement is valid? Please explain.
RESPONSE 22-12	Yes, the agreement is valid. The Town Council duly authorized the Mayor's signature on January 10, 2017. Please see the Resolution of the Town Council of Johnston, dated January 10, 2017, attached to the Water Supply Plan as Appendix F, Exhibit A, wherein it expressly states that "the members of the Johnston Town Council hereby **ratify** and authorize Mayor Joseph M. Polisena to enter into the attached Water Supply and Economic Development Agreement between the Town of Johnston and Clear River Energy LLC for the purchase of water from the Town of Johnston."(Emphasis added.)
RESPONDENT:	Alan M. Shoer, Esq., Richard R. Beretta, Jr., Esq., Nicole M. Verdi, Esq.
DATE:	February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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IN RE: INVENERGY THERMAL DEVELOPMENT LLC's APPLICATION TO CONSTRUCT THE CLEAR RIVER ENERGY CENTER IN BURRILLVILLE, RHODE ISLAND

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INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-13 Under the water plan, is it correct that Invenergy stated to the EFSB that 2 trucks per day on average will be needed to deliver water? However, Johnston's agreement indicates 3 trucks per day and up to 5 trucks per day will be needed on average to deliver water to the site. Do you agree that information to the EFSB needs to be amended accurately reflect which figure is correct? Please explain and amend as needed.

RESPONSE 22-13 Under the Water Supply Plan, Invenergy stated that: "The range in the number of truck deliveries for normal operations is typically 2 to 3 trucks per day." (Page 14).

The water supply agreement with the Town of Johnston, Section 2(a), entitled "Flow Rate," provides an estimate that contemplates that there will be times when truck deliveries cannot be made due to events such as adverse weather or holidays, so the agreement included language to account for these circumstances. The Agreement specifies that "CREC estimates that up to 3 truck deliveries per day will be required to satisfy expected water use needs of the Project. However, up to five (5) trucks a day may be necessary for certain operational occurrences and weather related impacts. This is the Average Demand Flow Rate." (Section 2(a)(i)). The 3 to 5 trucks per day is a reflection that there are varying plant operations and varying conditions in which trucks can be delivered. The information provided to the EFSB does not need to be amended.

RESPONDENT: Daniel Ewan, Invenergy Thermal Development LLC

DATE: February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-14 Under the water plan, is it correct that under the Johnston water agreement, CREC has allowed themselves a provision to alter its water consumption at any time? What if CREC decides to sell water 3r[d] party to another vendor, outside of their sole use? Do you agree that there is no provision in the agreement that would prevent you from doing so? Please explain.

RESPONSE 22-14 Invenergy does not understand what provision of the Agreement (if any) you are referring to in this question. In Section 7(a)(ii) of the Agreement, CREC does represent that is has "the ability to adjust its Daily Water Demand through the use of on-site storage tanks and other operational adjustments between the Standard Demand Flow Rate and the Increased Demand Flow Rate when operating on natural gas. CREC also has the ability to adjust its daily demand for truck deliveries for any of the Demand Flow Rates by relying on such on-site tanks."

The third and seventh whereas provisions of the Water Agreement with Johnston clearly lay out the intentions of the Parties (Invenergy and the Town of Johnston). We repeat those here for clarity:

- Whereas, in connection with the operation of the Project, CREC requires a reliable source of water in sufficient quantities to meet the Project's demand;

- Whereas, Johnston has the available water supply capacity and has agreed to supply the Project with a reliable source of water in sufficient quantities to meet the Project's demands on the terms and conditions set forth herein;

These provisions indicate that the intent of the Parties is to supply the Project's water needs and not those of third Parties. Invenergy does not have any intention to sell water to a third party.

RESPONDENT: John Niland, Invenergy Thermal Development LLC

DATE: February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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IN RE: INVENERGY THERMAL DEVELOPMENT LLC's APPLICATION TO CONSTRUCT THE CLEAR RIVER ENERGY CENTER IN BURRILLVILLE, RHODE ISLAND

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22-15	What will happen if an oil operation event occurs more frequently, or lasts longer due to a gas shortage? All the events above indicate that in addition to the figures provided, a 3 truck a day rate is needed just to supply water in addition to the figures above. Do you agree? Please explain.
RESPONSE 22-15	It is difficult to predict the frequency or duration of oil operation events. Invenergy anticipates that they will not be frequent or long in duration. Generally speaking, Invenergy anticipates that it will replenish the tanks shortly following an oil operation event, at the rate specified in the Water Supply Plan. The rate of approximately 22 trucks a day as specified in the Water Supply Plan includes the water trucks needed for continued operation on gas following an oil operation event. The units can run only as long as there is an adequate supply oil and water onsite. Once the oil and water is depleted, the units cannot run, as set forth in 22-7 and 22-8.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-16	Please provide Schedule 1 to the Benn Water Agreement.
RESPONSE 22-16	Attached as **Exhibit 1** is a redacted version of Schedule 1. Please note that Schedule 1 contains confidential third-party proprietary pricing information of a private company that Invenergy is not in a position to disclose.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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22-17	Please specifically identify and explain the status of the "all necessary permits and/or local approvals" needed as described in the last paragraph of 2.0 of the Water Supply Plan.
RESPONSE 22-17	Once the site for the truck filling station, to be located in Johnston, has been selected, Invenergy will begin the permitting process as needed with the Town of Johnston with regard to any new real estate and the new Water Transport Facility, as referenced in the Agreement on Page 3. If Invenergy chooses to buy an existing facility, the permitting requirements, if any, will be determined and processed at that time.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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IN RE: INVENERGY THERMAL DEVELOPMENT LLC's APPLICATION TO CONSTRUCT THE CLEAR RIVER ENERGY CENTER IN BURRILLVILLE, RHODE ISLAND

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INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-18 How exactly will Invenergy "limit winter distillate oil firing" as discussed in paragraph 2.2.1 (third paragraph)? Will the CREC be subject to pay for performance payments? If so, how much?

RESPONSE 22-18 Winter distillate oil firing is limited by the quantity of water and oil available onsite as well as the ability to re-fill the on-site storage. Invenergy will participate in the ISO-NE day ahead energy market and is subject to all of its associated rules. In the event that both natural gas and oil are not available for the unit(s) to operate and the unit(s) are called on to operate, it is possible that CREC would be subject to pay for performance penalties. It is not possible to determine the penalty amount as that is dependent on the specific market conditions at the time of the capacity shortfall.

RESPONDENT: John Niland, Invenergy Thermal Development LLC

DATE: February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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22-19 Mr. Niland recently publicly stated that the facility will cost approximately $1 billion to build, not $700 million. What is the impact of this $300 million cost increase in Invenergy's financial projections? Has Invenergy revised its financial model based on this $1 billion cost estimate? If not, why not? If so, please provide a copy.

RESPONSE 22-19 The cost estimate that was provided in Invenergy's Application (Section 4, Project Costs) did not include impact fees payable to the Town of Burrillville, the interconnection costs for the transmission line and electric facility upgrades and did not include financing costs and security requirements. Additionally, the costs that it did include have been updated to incorporate bid estimates and firm quotes for equipment and construction.

Invenergy's financial models and the firm quotes Invenergy has received are highly confidential and proprietary and will not be provided. The Project is being privately financed without ratepayer funds and the power produced will be sold into the competitive ISO-NE market through a competitive bidding process.

RESPONDENT: John Niland, Invenergy Thermal Development LLC

DATE: February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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22-20	Has Invenergy requested PA consulting Group ("PA") to update its "monthly 20-year forecast (2019 through 2038) of the ISO-NE power market and a 20-year forecast (2019 through 2038) of PEC's operations and cash flows,"[1] based on the revised Water Supply Plan filed with the EFSB on January 1, 2017? If not, why not? If so, please provide a copy.
RESPONSE 22-20	No, Invenergy has not requested PA update its forecast. Invenergy does not believe that the Water Supply Plan will have any material impact on the PA forecasts.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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22-21	When providing a copy of any analysis, please provide a copy of the output of the model in sufficient detail to understand the forecasts.
RESPONSE 22-21	Please see Invenergy's response to 22-20. Because PA has not updated its forecast, a copy of the output does not exist.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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22-22	If the PA forecast of future operations has not been updated, provide a copy of the most recent forecasts by Invenergy or any other consultant working for Invenergy relating to the operation of the CREC.
RESPONSE 22-22	The most recent forecast was prepared by PA and was attached to Ryan Hardy's Pre-Filed PUC Testimony as confidential and redacted versions of Exhibits RH-2 & RH-3. This forecast was filed with the Board on July 20, 2016.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-23 Provide the following annual data:

a. Annual number of MWH the CREC is anticipated to produce operated on natural gas between 2019 and 2038 broken down by calendar year;
b. Annual number of MWH the CREC is anticipated to produce operated on ultra-low sulfur distillate ("ULSD") between 2019 and 2038 broken down by calendar year;
c. Annual cost of water in $/MWH added to the variable cost of the unit when firing ULSD.

RESPONSE 22-23

a. The MWhs provided below were based on the previously provided confidential PA Consulting, Inc. forecast. The forecasted MWhs listed below are **confidential**.

[redacted]

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[redacted]

b. Neither Invenergy nor PA has calculated the annual number of MWh CREC is anticipated to produce when operated on ultra-low sulfur distillate between 2018 and 2038 broken down by calendar year. In summary, absent discrete gas shortage events (which are random events which cannot be forecast), PA does not project CREC to utilize ULSD.

c. Invenergy has not calculated the annual cost of water in $/MWh added to the variable cost of the unit when firing ULSD.

RESPONDENT: John Niland, Invenergy Thermal Development LLC
Ryan Hardy, PA Consulting, Inc.

DATE: February 14, 2017

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22-24 Provide the estimated monthly number of mobile demineralization trailers that will be needed per calendar year between 2019 and 2038 to operate the CREC and the total cost.

RESPONSE 22-24 CREC would need approximately 1 mobile demineralizer trailer every month.

During the summer months, the number of demineralized trailers would be slightly higher based on the number of hours the Facility would use evaporative cooling. As an example, if the Facility used the evaporative cooling for 6 hours throughout the summer, the additional usage would require approximately 1 additional trailer per month during that period.

The rental costs of these trailers are confidential and proprietary.

RESPONDENT: John Niland, Invenergy Thermal Development LLC
Amit Nadkarni, Invenergy Thermal Development LLC

DATE: February 14, 2017

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22-25 Provide all cost benefit analyses prepared or considered by Invenergy in selecting its most recent source of water in the Water Supply Plan submitted to the EFSB.

RESPONSE 22-25 Invenergy's cost benefit analyses are highly confidential and proprietary. The Project is being privately financed without ratepayer funds and the power produced will be sold into the competitive ISO-NE market through a competitive bidding process.

The analysis performed was related to Invenergy's desire to conserve as much water as possible and operate CREC in a more environmentally friendly manner. There were a number of engineering uncertainties that arose regarding the initial design and proposed installation of the pipeline. Once it was determined that Invenergy had the ability to reduce the amount of water for CREC, making the trucking option feasible, Invenergy decided to utilize the trucking option for its water source.

RESPONDENT: John Niland, Invenergy Thermal Development LLC

DATE: February 14, 2017

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22-26	Provide all water ranking analyses or other documents analyzing the costs, benefits and shortcomings Invenergy developed or considered prior to submission of the Water Supply Plan to the EFSB
RESPONSE 22-26	Please see Invenergy's response to Data Request No. 22-25 above.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

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22-27 Can an industrial accident anywhere on the power plant site trigger a subsequent or chain reaction at the compressor station site? Please explain.

RESPONSE 22-27 This appears to be the same question that was asked and answered in Invenergy's responses to the Town of Burrillville's (Town) Request No. 17-2, including the Exponent letter that was attached to Response No. 17-2.

To repeat, here is Invenergy's Response to No. 17-2 (exhibit not re-attached):

We do not believe it is possible that a problem at the Clear River Energy Center (CREC) could cause an explosion at the Spectra/Algonquin compressor station. The codes and standards incorporated into the design and construction of the CREC and the physical separation of the Algonquin compressor station and the CREC minimizes the possibility of direct impacts to the Spectra/Algonquin compressor station in the remotely possible event of a fire or explosion at CREC.

The design of the CREC incorporates the requirements of dozens of industry standards including but not limited to American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, National Fire Protection Association (NFPA), National Electric Code (NEC), American Petroleum Institute (API). Adherence to these standards minimize the likelihood that there would ever be a fire or explosion at the CREC.

In order to determine potential scenarios that should be examined, Invenergy examined the systems and associated design features at CREC. These systems and features are typical to gas fired power plants, and as such, the Project design will also include design features to mitigate consequential damage to other portions of the CREC facility and keep any impact area within the confines of the CREC property. The key systems that could have a potential to cause a fire or explosion are listed below and their associated specific design features include:

1. Natural gas: The natural gas piping systems and components are separated from the other sections of the Project (to the extent possible) and all areas where natural gas systems and components are located are designated with an area classification that requires special design features that include explosion proof electrical components, gas detectors that are linked to automatic isolation systems and fire detection and suppression systems. Should a leak occur, the gas detection sensors are set to detect the gas before a concentration level is reached that would be capable of creating an

explosion that could impact a larger area of the plant. For these reasons, the amount of any gas that could leak is limited such that it would not spread to an ignition source.

The CREC fuel gas system will be equipped with automatic detection and emergency shutdown systems, including the following:

- The natural gas will be odorized for detection.
- A network of low concentration natural gas detectors will be installed to monitor for fuel gas leaks in the gas yard and within all areas where fuel gas equipment is located, both indoors and outdoors. The detectors will be set to alarm in the facility main control system ("DCS"). The custom-designed fire alarm and detection system will be in accordance with NFPA 72.
- In accordance with NFPA 850 the plant will include emergency shutdown systems to isolate the gas piping, stop equipment and safely vent station gas. The natural gas supply pipeline will include an emergency shutoff valve (ESV) at the outlet of the metering yard and the ESV will automatically close in the event that a fire is detected.
- Individual unit shutdown systems in case of mechanical or electrical failure of a compressor unit system or component.
- Main line isolation valves will be fire safe, as defined by API 607.
- Nitrogen hose connections and vent lines will be provided between all isolatable sections of the fuel gas piping to allow nitrogen purges and inerting for maintenance activities.
- The fuel gas piping will be cleaned and purged in accordance with NFPA 56.
- Pressure control devices to maintain the operating pressure at or below the maximum allowable operating pressure. In addition, overpressure protection devices with sufficient capacity and sensitivity will be installed to ensure that the maximum allowable operating pressure of the station piping and equipment will not be exceeded by more than 10 percent (10%) in the case of a malfunction of the pressure control equipment.
- All electrical equipment will be explosion proof.
- System design to accommodate changes in gas quality, periodic maintenance (e.g., filter change-out), redundancy, separation of

ignition sources (e.g., National Electric Code compliance), combustion controls and hardened to resist impacts.

- Prevent damage to pipe by as-built mapping, below-grade flagging (above grade) and clear labeling of gas-bearing components.
- Flame detection that uses ultraviolet sensors.

Safe operating practices will include the following at a minimum:

- Periodic walk-through surveys of pipeline systems with hand-held gas detectors at all flanges, valves and other fittings; this is particularly important in the Gas Yard at filter, dewpoint heater equipment, pressure control valves and metering runs where many fittings and gas state changes occur that may contribute to leakage events.

- Strong operating and maintenance procedures, including use of inert gas purging, maintenance of coating and cathodic protection systems, dewpoint heating, filtration and verification of valve and instrument functionality.

The gas system design features include, controls utilizing gas detection, fire detection and suppression and when combined with regular inspections and proper maintenance of gas system equipment, limits this type of event to be confined within a smaller area thereby virtually eliminating the potential for undetected gas leaks that could lead to a fire or explosion.

2. Hydrogen: Modern utility generators larger than about 300 MW are hydrogen or hydrogen and water cooled. Hydrogen has safely been used as the coolant medium in utility generators for over 70 years. General Electric ("GE") estimates that there are more than 2,400 hydrogen cooled GE designed generators in service today. The generator and associated hydrogen cooling system include a number of features to ensure the safe operation of the equipment:

   The generator applied to CREC is hydrogen cooled, and as with the potential for a natural gas leak, there will be hydrogen leak detection sensors located on the generator which stringently monitor for potential leaks. These

detectors will be set to monitor, alarm and take protective actions when hydrogen is detected at a level that is below the lower explosive limit.

The generator is equipped with end shields on each end, designed to support the rotor/bearings, to prevent gas from escaping, and to be able to withstand a hydrogen explosion in the unlikely event of such a mishap. In order to provide the required strength and stiffness, the end shields are constructed from steel plate and are reinforced. Horizontally split inner and outer oil deflectors are bolted into the end shield and provide sealing of the oil along the shaft.

Furthermore, the hydrogen systems and components will be located in areas that are designated with an area classification that requires special design features including explosion-proof electrical components, gas detectors that are linked to automatic isolation of systems and integrated with the fire detection and suppression systems.

The generator will have an internal volume of hydrogen that will be maintained in a sealed condition using multiple redundant seals. The seals will include mechanical seals and a seal oil system that uses pressurized oil barrier between the mechanical seals and the rotating shaft. The seal oil maintains an air-side seal and a hydrogen-side seal by forcing oil in both directions. The oil is monitored to detect any hydrogen that may get entrained into the oil and provide a means to scrub the hydrogen from the oil.

Hydrogen, like all flammable gases, is only reactive when it is present in concentration levels between the lower explosion limit and the upper explosive limit. That is, when there is sufficient oxygen present to sustain combustion. The generator will be equipped with a purity monitoring system that measures the quality of hydrogen in the generator. If the purity level begins to decrease toward the upper explosive limit, this system adds hydrogen to maintain purity.

The generator will also be equipped with an inert gas (one that does not react with hydrogen) purge system to purge the generator of hydrogen should generator maintenance be necessary. This system will also be used to purge and dilute the hydrogen to below the lower explosive limit if there is a leak. These systems are used throughout the power industry and have successfully controlled and prevented hydrogen explosions. Daily inspections and proper maintenance of equipment help to reduce this hazard.

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3. Main Transformer: The potential for an explosion is remote, its causes include lightning strike or transformer fault. The design features fire detection and suppression systems, location within a three sided concrete wall structure to protect immediately adjacent equipment systems and buildings and such that the open side has adequate space separation for protection for adjacent transformers and other equipment. Given the small impact area and the three sided walled enclosure, this scenario was ruled out as having any potential to impact Spectra's Burrillville station.

While we believe that the impact of any conceivable event at CREC will not migrate to the Algonquin compressor station, in order to address the question on the likelihood of an explosion occurring, we contacted Exponent, Inc., who is an industry recognized expert in conducting the type of analysis that was requested and asked that they conduct an evaluation of the probability of either a natural gas explosion or a hydrogen explosion event and to determine the maximum impact radius of the worst case scenario, no matter how unlikely. Exponent performed the evaluation which is included as an attachment.

As can be seen in the attached study provided by Exponent, the likelihood of either the Algonquin Station or the CREC facility suffering a gas explosion event as described in the question is anticipated to be on the order of 10^{-5} to 10^{-6}/yr, or once every 100,000 to 1 million years.

We also requested Exponent to describe what conditions, along with any assumptions and associated reasoning, would be necessary, no matter how unlikely, in order for such an event to occur and to determine the size of the impact radius that could result from such an event. Their inputs, assumptions and analysis are included in the attached report which concludes that even with postulating physically impossible scenarios like having the maximum possible volume of gas be released instantaneously and fill the largest contained area (the power block building) with a "stoichiometric natural gas/air mixture in order to maximize the confined volume of fuel involved in the explosion," the resulting impact area does not impact the Spectra compressor station.

Also, as addressed in the response to question 17-4, Exponent determined the distance away from the source of a worst case hypothetical explosion, where the blast wave pressure threshold of 1 pound per square inch gauge could reach. This threshold is the lowest pressure criterion for damaging explosion effects described in the ALOHA technical documentation and the EPA Risk

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Management Program Offsite Consequence Analysis. At 1 psig of pressure, a blast wave could shatter glass windows, however much higher pressures are necessary to damage the buildings or equipment at the compressor station. The calculated distance to the 1 psig pressure threshold for the maximum postulated scenario (no matter how improbable) was found to be no more than 884 feet from the source on the CREC site which does not create any damage to equipment at the Spectra/Algonquin compressor station, please refer to the attached Exponent letter response for the details of this analysis.

RESPONDENT: John Niland, Invenergy Thermal Development LLC

DATE: February 14, 2017

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22-28 How will the Spectra compressor station and pipeline be protected from an event potentially triggering a larger scale accident at the Spectra site? Has this potential been calculated into the scope of the impact area proximate to the site?

RESPONSE 22-28 Invenergy cannot speak for Spectra or to the details of the Spectra site. However, please see Invenergy's response to Town's Request No. 17-1 and Spectra Letter, attached to Invenergy's response to Town Request No. 17-1.

To repeat, here is Invenergy's Response to No. 17-1 (exhibit not re-attached):

Invenergy Thermal Development LLC ("Invenergy") does not believe there is a possibility that an explosion at Spectra's Burrillville Compressor Station ("BCS") could cause an explosion at Clear River Energy Center ("CREC"). As discussed in our response to questions 17-2, 3 and 17-4 Invenergy engaged Exponent as an expert consultant who has ample experience in evaluating the types of events that are being postulated in the question. Exponent estimated the area that could be impacted by an event at either location is really a function of the size of the enclosed area (e.g. building) where gas could accumulate and given that the powerhouse building at CREC is larger and has more volume than the building at Spectra's site, an event at CREC would be governing. Please refer to the response to question 17-2 for the results of this event.

As it relates to the potential of an explosion at the Spectra/Algonquin compressor station which could cause damage at CREC, Invenergy contacted Spectra with regard to this question, and Spectra provided the attached letter that highlights the diligence associated with safe operation and maintenance of natural gas compressor facilities and outlines the federal standards they use for the design and maintenance of their facilities. In the attached response Spectra indicates that their Integrity Management Program has determined the Potential Impact Radius ("PIR") of a possible event, and the PIR is limited to their site and more specifically the fenced area of their site (as it relates to an event at the BCS itself).

The physical separation of the Algonquin compressor station and the CREC minimizes the possibility of direct impacts to the CREC in the remotely possible event of a fire or explosion.

RESPONDENT: John Niland, Invenergy Thermal Development LLC

DATE: February 14, 2017

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22-29	Does the change in plant processes associated with the reduction in water usage have any impact on site and neighborhood safety? Please explain.
RESPONSE 22-29	The change in plant process associated with the reduction in water usage does not have an impact on site and neighborhood safety.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

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22-30 Please provide the identity and location of all power plants Invenergy or its subsidiaries (or other operators) operate with the newly proposed water/sewer saving technology to be incorporated into the CREC plant.

RESPONSE 22-30 Invenergy utilizes the mobile demineralizer trailers at their Cannon Falls, MN, Spindle Hill, CO and Ector County, TX facilities and has used them on a temporary basis at other facilities, such as Invenergy's facilities in St. Clair Ontario, Nelson, Illinois and Grays Harbor, Washington State.

The water savings technologies identified under the Water Supply Plan are conventional water treatment technologies that have been employed at many power plants and industrial facilities in one form of another for many years. In this application, the water saving technologies are not unique nor are they new. The water saving technology that will provide the most significant benefit to the reduction in water use and wastewater reduction at CREC is the use of Ion Exchange Resins in the form of mobile demineralization trailers and some simple industrial filtration systems.

Ion Exchange Resins have been employed for many years at many electric utility generating facilities and at many industrial facilities to produce high purity demineralized water from local water supplies. The Ion Exchange Resins once depleted by the removal of dissolved salts in the water supply must be regenerated by use of acid and caustic solutions. Mobile Demineralizer Trailers are simply ion exchange resin vessels and piping mounted on mobile trailers so the regeneration of the ion exchange resins can be conducted at the mobile trailer vendor's facility where the ion exchange resins are regenerated avoiding a need to chemically regenerate the ion exchange resins at the user's facility.

The use of mobile demineralization trailers employing ion exchange resins significantly reduced water use and wastewater generation at the CREC facility over the previously proposed on-site water treatment system albeit at an increased cost for the trailer demineralizer service. The mobile demineralizer trailers contain only ion exchange resins stored in demineralizer vessels and do not transport any chemicals.

To reduce water use and recycle wastewater at CREC other industrial filtration systems will also be employed. These filtration systems are industrial size filters that in a smaller form are used by many homeowners as swimming pool filters. Cartridge, sand and pre-coat type filters are commonly used by many

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home owners to filter swimming pool water to remove suspended dirt, hair and oil from swimming pool water. These same filtration systems at an industrial size will be employed at CREC to remove particulates, dirt and potentially low levels of oil from floor and equipment drains and from boiler blowdown within the facility. The filtered water will be recycled to the Service Water Storage Tank for processing by the mobile demineralizer trailers for the removal of dissolved salts.

GE Mobile Water Inc. is one of the vendors that supplies mobile demineralizer services and attached as **Exhibit 2** is a letter from GE Mobile Water that provides additional information on the breadth of their services.

RESPONDENT: John Niland, Invenergy Thermal Development LLC
Amit Nadkarni, Invenergy Thermal Development LLC

DATE: February 14, 2017

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22-31 There is mention of summer time evaporative cooling usage at a rate of 4,600 gallons per hour (gph). There is limited mention of the duration for such an event (seldom during evenings, etc.), but no defined duration per event.

a. How many hours per day would evaporative cooling usage occur?
b. How many days per year on average would evaporative cooling usage occur?

RESPONSE 22-31

a. The 4,600 gallon per hour was a conservative estimate based on the ambient conditions of 90F degrees with a 45% relative humidity. As temperature and humidity can change throughout the day, it is difficult to predict; however, typical consumption will be at a lower rate. On average, Invenergy expects the evaporative cooling usage would be 4-6 hours per day.

b. As temperature and humidity can change throughout the day, it is difficult to predict. It is expected that evaporative cooling would only be used during the summer months (part of June through part of September).

RESPONDENT Amit Nadkarni, Invenergy Thermal Development LLC

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22-32 There are four (4) water balance diagrams showing different typical scenarios, but none of the scenarios include evaporative cooling usage.

a. How much of the water used during the evaporative cooling scenarios would be consumptive (i.e., result in losses that would require make-up water)?
b. What would be the source of this water?
c. How would it be supplied to the site?

RESPONSE 22-32

a. Sheet 2 of the water mass balance attached to the Water Supply Plan specifies 4,600 gallons per hour for 2 units which is approximately 39 gallons per minute for each unit at 90F degrees and 45% relative humidity. This is the consumptive loss during those conditions, assuming both units at full load output. As stated in Response 22-31, the typical consumption will be lower.

b. The water needed for evaporative cooling is a 50/50 blend of service water and demineralized water. The water utilized for this purpose will be the same source as the water indicated in the Water Supply Plan and there is no special source for this water supply.

c. All needed water will be trucked to the Facility as described in the Water Supply Plan.

Please refer to water mass balance diagram, Appendix C, furnished as a part of the Water Supply Plan, which depicts the source of water within the plant that feeds the evaporative coolers, to better understand the flow.

RESPONDENT: Amit Nadkarni, Invenergy Thermal Development LLC

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22-33 Assuming a 3-day oil-fired event, as outlined in the report as a worst-case scenario, do you agree that approximately 2.2M gallons would be consumed? It is unclear in the water plan as to the capacity of the various storage tanks (service/fire water and demineralized water). What are all the proposed on site water storage capacities?

RESPONSE 22-33 If the Facility were required to operate on fuel oil for 3 consecutive days, the water consumption would be approximately 2,250,000 gallons. This capacity is accommodated between the service water and the demineralized water tank.

The storage capacities of these tanks is as follows:

Fire Water/Service Water – 1,050,000 gallons of which 650,000 gallons is dedicated to fire water.

Demineralized Water – 1,850,000 gallons.

RESPONDENT: Amit Nadkarni, Invenergy Thermal Development LLC

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22-34 The plan outlines a lengthy refill strategy of up to 1 month where approximately 9 additional trucks per day (72,000 gpd) will be used.

a. Is there a minimum water storage capacity required or planned at the site for fire protection?
b. Is there a plan to have some peak water truck delivery (for example, 30 to 60 trucks on Day 1 of the refill) in order to satisfy fire protection needs?

RESPONSE 22-34

a. Yes, the tank will be designed for approximately 650,000 gallons of dedicated fire water storage.

b. No, the firewater tank will be filled up during the construction/commissioning phase, and the reserve water will be untouched unless a fire event has occurred at the plant. If there is a fire event, CREC would expect to replenish the tank in the same manner as following an oil fired event.

RESPONDENT: Amit Nadkarni, Invenergy Thermal Development LLC

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22-35	Is it possible that this revised process may impact the overall footprint of the facility and further impact wetlands? Please explain, and please submit a site plan for the revised facility.
RESPONSE 22-35	The new water plan affected individual components within the plant but not the overall footprint of the Facility. Accordingly, there is no further impact to wetlands. A revised site plan is being prepared and will be provided in the near future.
RESPONDENT:	Amit Nadkarni, Invenergy Thermal Development LLC
DATE:	February 14, 2017

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22-36	Is it true that with the reduced process water demand for the project, the local water suppliers may have adequate capacity to provide water to the CREC? Could a local water supply be piped to the site, eliminating the impacts of trucking water to the site?
RESPONSE 22-36	Yes, if a local water supply were willing to commit to supplying water to the Project, Invenergy would of course be interested in working with a local water supply. If the Town has a particular local supplier in mind, please let us know. No local water supplier has approached Invenergy to supply water at this point, with the reductions as referenced in the Water Supply Plan.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
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22-37	Could onsite subsurface conditions be evaluated to determine if the site could provide both process and potable water to the facility?
RESPONSE 22-37	As noted in the recently-submitted Water Supply Plan, an on-site well will be used for potable water. However, with regard to process water, in consideration of the many concerns expressed by the Town of Burrillville over the use of local water supplies and the possible use of water from a previously-contaminated Pascoag Utility District (PUD) groundwater well for process water for the CREC, an alternative water supply plan has been developed. Given the high level of uncertainty in the yield of bedrock water wells and the previously expressed concerns regarding the use of water within the Clear River watershed, Invenergy does not plan to evaluate the potential for use of an on-site water source(s) for process water for the CREC.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
ENERGY FACILITY SITING BOARD

IN RE: INVENERGY THERMAL DEVELOPMENT LLC's APPLICATION TO CONSTRUCT THE CLEAR RIVER ENERGY CENTER IN BURRILLVILLE, RHODE ISLAND

DOCKET No. SB-2015-06

INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-38 Do you have agreements with a treatment facility to take the wastewater? If so, please provide copies. If not, please explain why not.

RESPONSE 22-38 There is no agreement with any facility to treat the wastewater at this time. This will be completed before the operational phase of the Project.

Preliminary discussions with licensed entities such as Clean Harbors, Tradebe, and Mass Tank Disposal confirms that the quality of wastewater generated by the CREC is well within the permissible limits that their treatment facilities would be able to process.

For more information on the wastewater and wastewater quality, please refer to Section 3.2 and Table 3.1(projected wastewater quality) of the Water Supply Plan.

RESPONDENT: John Niland, Invenergy Thermal Development LLC

DATE: February 14, 2017

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22-39	Please verify the water truck planned capacity, which has been reported as both 7,200 gallons and 8,000 gallons.
RESPONSE 22-39	The water truck capacity is 8,000 gallons. The McMahon Traffic Analysis (Appendix E to the Water Supply Plan) is based on 8,000 gallons.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

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22-40	The Trip Generation in the original report (May 2016) does not specifically reference an oil-fired event. Please explain in detail the assertion that the generated traffic from such an event has been reduced.
RESPONSE 22-40	Page 16 of the Traffic Impact Study, dated May 2016, indicates the frequency of the oil trucks at 3 - 4 per hour. This would lead to 24 - 32 trucks in an 8 hour period. The revised Plan states that there will be a total of 22 trucks (water, oil, ammonia, demineralized water, wastewater) per day over the replenishment period.
RESPONDENT:	Amit Nadkarni, Invenergy Thermal Development LLC
DATE:	February 14, 2017

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22-41	Is there a plan for monitoring and/or enforcing the voluntary extension of the oil-firing replenishment duration? Are the specifics of this duration extension documented somewhere? Wouldn't this be inefficient and costly for the operators? Please explain.
RESPONSE 22-41	The durations that were based on the 22 trucks per day, were based on Invenergy's reasonable expectation and is Invenergy's commitment to balance the needs for replenishment with traffic impacts. The specifics are documented in Invenergy's Water Supply Plan, Section 2.2.1, Section 2.3.1 and Appendix E.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

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22-42 What truck percentages were used in the previous signalized intersection analyses and in the updated analysis? Please explain.

RESPONSE 22-42 Both analyses report the worst-case-scenario conditions during the peak hours when the proposed site experiences a response to an oil fire event, which would require additional water and oil trucks to access the site. The Traffic Impact Study reports that following an oil fired event, trucks will access the site to a total of four trucks per hour during peak hours.

The supplemental analysis reported in the January 11, 2017 memorandum (Appendix E of the Water Supply Plan) reports that in an effort to reduce traffic impacts of the oil fired response trucks, oil replenishment will be extended over a longer duration, reducing the number of daily trucks and trucks that are expected to access the site during the peak hours. With the proposed water trucks as well as the oil fired response, it is expected that no more than three trucks would access the site during the peak hours. This decrease in daily and peak hour trucks was a result of the change in response duration for replenishing oil after an oil fired event.

The analysis was revised to reflect this change as were the truck percentages for the final build condition. Synchro analysis reports showing the difference in traffic volumes and truck percentages are attached as **Exhibit 3**.

RESPONDENT: Maureen Chlebek, McMahon Associates

DATE: February 14, 2017

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22-43	Please provide the Synchro © (computer analysis) files for the signalized intersection analyses for both the current projections and the original projections.
RESPONSE 22-43	Synchro report sheets for the final build condition from both the traffic impact study and January 2017 memorandum are attached as **Exhibit 3**. The reports show the input data used.
RESPONDENT:	Maureen Chlebek, McMahon Associates
DATE:	February 14, 2017

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22-44	Please provide a copy of Johnston's wholesale water agreement with Providence Water.
RESPONSE 22-44	Invenergy is not aware that any such agreement exists. Invenergy understands that Johnston purchases its water from Providence Water Supply pursuant to Providence's wholesale tariffs.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

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22-45 Please provide the total estimated truck emissions that will be generated on an annual basis, by type and amount, for all of the trucks coming and going from the facility:

a. During the construction period.
b. During the operating period.

Please explain what impact these emissions will have on the people who live in Burrillville and the wildlife near the plant.

RESPONSE 22-45 **Exhibit 4** provides a summary of the total estimated truck emissions that will be generated on an annual basis, by type and amount, for all of the trucks coming and going from the Facility during the construction period and during the operating period.

Any ambient air quality impacts resulting from truck emissions both during the project construction and operating periods would be temporary and transient in nature. Because truck emissions are released at a relatively low velocity and elevation, they do not disperse far from their source. Thus, the areas primarily impacted will be along the roadways themselves and in those areas closest to the roadways to be used. Any people or wildlife who do spend extended time in those areas are already experiencing temporary air quality impacts from existing vehicular traffic on those roadways and may experience only minor increases in those impacts for very short periods of time as a result of the truck traffic associated with the Project.

RESPONDENT: Michael Feinblatt, ESS Group, Inc.

DATE: February 14, 2017

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22-46 Do you agree that diesel exhaust has been categorized as an INRC class 1 carcinogen? If not, please explain.

RESPONSE 22-46 The International Agency for Research on Cancer (IARC) classified diesel engine exhaust as carcinogenic to humans (Group 1) in 2012, based on sufficient evidence that exposure is associated with an increased risk for lung cancer. This classification was based on the results of a large 2012 US National Cancer Institute/National Institute for Occupational Safety and Health study of occupational exposure to diesel exhaust emissions in underground miners, which revealed an increased risk for lung cancer in exposed workers. This study, which was conducted on workers in eight non-metal mining facilities, found a statistically significant positive gradient in lung cancer risk primarily among heavily exposed workers, and concluded that their findings provided further evidence that diesel exhaust exposure may cause lung cancer in humans and may present a potential health burden. This study, which was the primary basis of the IARC's classification of diesel engine exhaust as a carcinogen, did not conclude that temporary, transient exposure to diesel engine exhaust from vehicular traffic along a public roadway is associated with an increased risk for lung cancer.

RESPONDENT: Michael Feinblatt, ESS Group, Inc.

DATE: February 14, 2017

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22-47 Do you agree with the following excerpt from an article written by the Union of Concerned Scientists? Please explain anything you disagree with:

Health Impacts of Diesel Pollution

Diesel-powered vehicles and equipment account for nearly half of all nitrogen oxides (NOx) and more than two-thirds of all particular matter (PM) emissions from US transportation sources.

Particulate matter or soot is created during the incomplete combustion of diesel fuel. Its composition often includes hundreds of chemical elements, including sulfates, ammonium, nitrates, elemental carbon, condensed organic compounds, and even carcinogenic compounds and heavy metals such as arsenic, selenium, cadmium and zinc. Though just a fraction of the width of a human hair, particulate matter varies in size from coarse particulates (less than 10 microns in diameter) to fine particulates (less than 2.5 microns) to ultrafine particulates (less than 0.1 microns). Ultrafine particulates, which are small enough to penetrate the cells of the lungs, make up 80-95% of diesel soot pollution.

Particulate matter irritates the eyes, nose, throat, and lungs, contributing to respiratory and cardiovascular illnesses and even premature death. Although everyone is susceptible to diesel soot pollution, children, the elderly, and individuals with preexisting respiratory conditions are the most vulnerable. Researchers estimate that, nationwide, tens of thousands of people die prematurely each year as a result of particulate pollution. Diesel engines contribute to the problem by releasing particulates directly into the air and be emitting nitrogen oxides and sulfur oxides, which transform into "secondary" particulates in the atmosphere.

Diesel emissions of nitrogen oxides contribute to the formation of ground level ozone, which irritates the respiratory system, causing coughing, choking, and reduced lung capacity. Ground level ozone pollution, formed when nitrogen oxides and hydrocarbon emissions combine in the presence of sunlight, presents a hazard for both healthy adults and individuals suffering from respiratory problems. Urban ozone pollution has been linked to increased hospital admissions for respiratory problems such as asthma, even at levels below the federal standards for ozone.

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Diesel exhaust has been classified a potential human carcinogen by the U.S. Environmental Protection Agency (EPA) and the International Agency for Research on Cancer. Exposure to high levels of diesel exhaust has been shown to cause lung tumors in rats, and studies of humans routinely exposed to diesel fumes indicate a greater risk of lung cancer. For example, occupational health studies of railroad, dock, trucking, and bus garage workers exposed to high levels of diesel exhaust over many years consistently demonstrate a 20 to 50 percent increase in the risk of lung cancer or mortality.

RESPONSE 22-47 While the Union of Concerned Scientists did conclude the above, they also concluded in the same article excerpted that the federal government and state governments have taken steps to reduce diesel emissions, including the following:

- The EPA has adopted more stringent fuel standards to reduce the allowable sulfur content in diesel fuel, allowing for the use of advanced emission control technologies which can reduce emissions by more than 85 percent.

- The EPA has adopted stricter emission standards for heavy-duty trucks and off-road construction equipment. Advanced emission control devices have been developed to retrofit existing diesel engines to meet the stricter emissions standards adopted by the EPA.

As noted in the excerpted article, diesel technology has advanced rapidly in recent years in response to these regulatory measures. As a result, as more diesel vehicles equipped with advanced emission control enter the marketplace, the potential health impacts detailed in the article would be expected to decrease over time.

The article did not conclude that temporary, transient exposure to diesel engine exhaust from vehicular traffic along a public roadway is associated with an increased risk for lung cancer or other health effects.

RESPONDENT: Michael Feinblatt, ESS Group, Inc.

DATE: February 14, 2017

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22-48	What effect, if any, will the change in operating processes as set forth in the water plan have on data previously provided in the application and data responses? Please explain.
RESPONSE 22-48	CREC's new Water Supply Plan essentially replaces sections 6.2.3, 6.2.4 and 6.2.5 of the original EFSB Application and any water or wastewater related data requests. The effect of the change in operating processes on data previously provided in the application and data responses is detailed in the Water Supply Plan.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

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22-49 CREC's traffic Consultant McMahon Transportation. Engineers and Planners has analyzed the intersection of Pascoag Main and South Main Street Intersection's Level of Service (LOS) and reported that it degrades to "E" during construction for "short periods." Please have the consultant re-evaluate this intersection for the water refill truck traffic both during construction and post-construction and during water and oil refilling operations and provide a copy.

RESPONSE 22-49 The peak construction period (FNTP - Underground) was analyzed as it is the busiest phase for construction vehicles. This third construction phase is expected to generate approximately 70 construction delivery trucks per day for the nine month duration, as described in the traffic impact study. The next phase of construction (FNTP - Above Ground), is expected to be the first phase where the water trucks will be needed at the proposed site. This fourth construction phase, however, is expected to generate approximately 25 construction vehicles per day, significantly lower than the expected 70 construction delivery trucks per day in the previous construction phase. Despite the addition of the water trucks to the fourth construction phase, the total number of trucks is still much less than the third construction phase.

The number of vehicles expected through the referenced intersection post-construction and during water fill and oil fill operations is less than during the peak construction period, and therefore, it is not necessary to evaluate that scenario.

RESPONDENT: Maureen Chlebek, McMahon Associates

DATE: February 14, 2017

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22-50 Please have the CREC Traffic Consultant review and analyze tanker truck movements through the Pascoag Main/South Main Street and the Route 100 (Church Street) and High Street intersection because these movements require water tanker trucks to cross the centerline in order to make the turns and provide a copy. Please explain whether this movement will likely affect the LOS.

RESPONSE 22-50 While a previous analysis of the truck movements through Pascoag Main Street intersections along the truck route show that a WB-50 truck would need to encroach over the centerline to traverse this route, there are only three trucks anticipated during the weekday morning and weekday afternoon peak hours during worst case conditions (during oil fired event response). For truck size, the analysis has been based on a WB-50, which also depicts a worst-case scenario. However, 8,000 gallon water delivery trucks can be of different sizes and axle configurations, and may be smaller than a WB-50 design vehicle. Typical conditions for the site result in only one truck per hour for the majority of site operations. Despite the WB-50 truck encroachment, there is not a significant impact on operations expected and the condition would last for a short duration. Additionally, if the trucks delivering to the site are smaller than the design vehicle (WB-50), a lesser encroachment would actually occur. Therefore, the LOS is not negatively changed from the prior report.

RESPONDENT: Robert Smith, McMahon Associates
Maureen Chlebek, McMahon Associates

DATE: February 14, 2017

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22-51	Please have the CREC Traffic Consultant review and report on the truck turning radii versus the road geometry. This needs to be revisited. Do you agree that Invenergy/RIDOT will need easements to widen the radii at the Route 100 (Church Street) and High Street intersection, and that road geometry versus tanker truck turning radii will slow traffic and create roadway centerline conflicts at a confusing intersection? Please explain your answer.
RESPONSE 22-51	This issue was discussed in detail in the previously conducted Intersection Review prepared for Church Street and Main Street in Pascoag, which was filed with the Town of Burrillville's Planning and Zoning Boards, and is attached as **Exhibit 5**. It is unclear as to what additional analysis is being requested here.
RESPONDENT:	Maureen Chlebek, McMahon Associates
DATE:	February 14, 2017

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22-52	Please have the CREC Traffic Consultant review and report on the corner geometry versus turn radii at the Church Street corner adjacent to the Community Baptist Church and School. This intersection is 1,000 feet north of Route 100/High Street intersection.
RESPONSE 22-52	The roadway curve radius at this location measured graphically (without survey) along the existing Church Street centerline is approximately 160 feet. This is just above the 154 feet required for a curve with a design speed of 25mph (posted). RIDOT has installed a series of "chevron" type warning signs along the curve to alert drivers.
RESPONDENT:	Maureen Chlebek, McMahon Associates
DATE:	February 14, 2017

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22-53 Please have the CREC Traffic Consultant review and report on the sight distances at the Route 100 corner at Serio's Pizzeria. There is an abandoned building that limits sight distances at this corner located 200 feet south of Lauren Hill/Route 100 Intersection.

RESPONSE 22-53 While there may be an obstruction of sight lines from the driveway of the abandoned building, the condition is an existing condition that is not changed by the addition of the CREC. Sight distance from this driveway is controlled by the location of the building proximate to the road.

The roadway curve radius at this location measured graphically (without survey) along the existing Church Street centerline is approximately 140 feet. This is slightly below the 154 feet required for a design speed of 25mph, which is the posted speed at this location. RIDOT has installed a series of "chevron" type warning signs along the curve to alert drivers. We would recommend that RIDOT also consider adding advisory (20mph) speed plates to curve warning signs approaching the curve, as well as selectively trimming back vegetation along the southbound side.

RESPONDENT: Maureen Chlebek, McMahon Associates
Robert Smith, McMahon Associates

DATE: February 14, 2017

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22-54 Does the new cooling method increase the amounts of hazardous/contaminated materials such as ammonia, fuel, sewage, etc. to be transported over roadways through the Town and State? Please explain.

RESPONSE 22-54 The cooling method has not changed. The air cooled condenser (ACC) has been a part of the original plan presented to the EFSB.

If this question pertains to the Water Supply Plan and the use of demineralized trailers, the use of demineralizer trailers will not result in the production of any hazardous/contaminated materials. There will be no increase in the use of ammonia, sewage or fuel that will need to be transported over roadways through the Town and State. The demineralizer trailers contain only ion exchange resins fully contained in their treatment vessels that will be transported from the Facility to the trailer demineralizer service vendor's facility for regeneration or renewal. Non-hazardous Facility wastewater will be transported by truck from the Facility to licensed treatment facilities where this wastewater will be treated for disposal. Transport of this non-hazardous wastewater by truck avoids use of the Town's local sewer system.

RESPONDENT: Michael Feinblatt, ESS Group, Inc.

DATE: February 14, 2017

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22-55 What is the increased projection of accidents and spills which could occur by the increase in truck traffic at the four intersections/corners described above? Please explain.

RESPONSE 22-55 As previously described in comment responses to the Town dated May 11, 2016, traffic increases due to the proposed CREC were estimated for both the construction phase (for which we used the construction phase that generates the most trips) and for the post-construction operational phase when the plant is fully constructed.

Crash data was provided by the Town of Burrillville along Route 100, including the Pascoag Main Street, South Main Street and Church Street corridors. These roadways are inclusive of the two intersections on Pascoag Main Street and two horizontal curves previously described.

Crash rates were calculated for Route 100 in Burrillville. The crash rate for a roadway segment represents the number of crashes that occur per million vehicle miles traveled. The crash rates were then applied to the projected traffic conditions for the construction phase and the operational phase of CREC. Assuming that the roadway and adjacent conditions do not change, and that only the traffic volumes are increased, the crash rate would remain consistent in these phases and the increased traffic is likely to result in approximately one additional crash during the construction phase with the highest level of trip generation and approximately one additional crash per three-year period during the operational phase.

To estimate the increased risk of a traffic-related hazmat spill as a consequence of the added traffic from the CREC, methodology based upon research conducted at the New Jersey Institute of Technology was utilized. The formula utilizes the following components:

- SS-The serious spillage rate, which was calculated based upon crash and traffic data to be 0.0017 (number of crashes per million truck miles traveled)
- RL-The length of roadway
- AADT-The annual average daily traffic volume

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- %HV-The percentage of heavy goods vehicles

Applying the formula to the existing conditions on Route 100 between the Glocester/Burrillville Town line and the intersection of Church Street at Wallum Lake Road, the current probability of a serious spill is 0.22%. When the CREC is complete and operational, the added truck traffic will consist of the ammonia, water, and oil trucks described in the January 2017 memorandum. With the increased truck traffic from the operational condition of the CREC, the probability of a serious spill does not increase and continues to be 0.22%.

During the construction phase with the heaviest volume of traffic, the probability of a serious spill increases to 0.23% with an estimated additional 70 vehicles per day of truck traffic. The increase of risk for a serious spill is 0.01% which is very low.

RESPONDENT: Maureen Chlebek, McMahon Associates

DATE: February 14, 2017

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22-56 What size are ammonia containing delivery trucks? If the amount is increased, can ammonia containing trucks use an alternate route to the plant through a less populated area? The area along Route 100 from Steere Farm Road to Serio's Pizzeria is our most populated area in town, with two nursing homes (Bayberry Commons and Overlook Nursing Home) and two schools (Steere Farm Elementary and Baptist Community Church/School) within 1,500 feet of roadway. Please answer and explain.

RESPONSE 22-56 Based on Invenergy's experience at other plants, a 6,200 gallon truck was used in the traffic analysis that was attached to the Water Supply Plan as Appendix E.

The options for delivery to the site are limited and depend upon the location of the supply. When an ammonia supplier is selected, the truck route for those particular deliveries can be finalized and if other options are viable, consideration will be made to take the route that is least invasive.

RESPONDENT: Amit Nadkarni, Invenergy Thermal Development LLC

DATE: February 14, 2017

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22-57	Is Johnston your one exclusive primary water source or are you still considering any other water sources?
RESPONSE 22-57	Johnston is Invenergy's primary supplier. Invenergy has identified a contingent/redundant source, Benn Water & Heavy Transport Corp. Invenergy is still considering additional contingent/redundant sources.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

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DOCKET No. SB-2015-06

INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO THE TOWN OF BURRILLVILLE'S 22nd SET OF DATA REQUESTS

22-58	What will you do if Providence refuses to allow Johnston to re-sell water to Invenergy?
RESPONSE 22-58	If for some unknown reason, Johnston is unable to sell the water it obtains from the Providence Water Supply Board, Invenergy will utilize its contingent/redundant supply, as identified in its Water Supply Plan.
RESPONDENT:	John Niland, Invenergy Thermal Development LLC
DATE:	February 14, 2017

INVENERGY THERMAL DEVELOPMENT LLC
By its Attorneys,

/s/ Alan M. Shoer

Alan M. Shoer, Esq. (#3248)
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ADLER POLLOCK & SHEEHAN, P.C.
One Citizens Plaza, 8th Floor
Providence, RI 02903-1345
Tel: 401-274-7200
Fax: 401-751-0604
Dated: February 14, 2017

CERTIFICATE OF SERVICE

I hereby certify that on February 14, 2017, I delivered a true copy of the foregoing responses to the Town of Burrillville's 22nd Set of Data Requests via electronic mail to the parties on the attached service list.

/s/ Alan M. Shoer

EXHIBIT 1

(REDACTED)

SCHEDULE 1

CONFIDENTIAL PAYMENT TERMS

1. **Payment**. Subject to Due Diligence and an acceptable Water Supply Agreement, CREC agrees to request up to 3 trucks on average per day (the "Average Daily Supply") from Benn Water, for a contract price of $[redacted] per truck delivery. In addition, at times when CREC has to replenish on-site water storage, CREC will pay $[redacted] per truck delivery (including the cost to utilize GPS positioning to coordinate deliveries from multiple points of delivery).

2. **Payment for Transport**. CREC will pay a $[redacted] per truck delivery in the event Benn Water is solely transporting water from a Point of Delivery identified by CREC.

3. **Reservation Fee**. CREC will pay a $_____ fixed fee annually to Benn Water during the term of the Water Supply and/or Transport Agreement to reserve transport capacity, including winter season transport capacity.

EXHIBIT 2

GE
Water & Process Technologies

Craig H. Lockhart
Sales Manager

57 Seminole Avenue
Dumont, New Jersey 07628
U.S.A.

C: 551-265-4052
craig.lockhart@ge.com

February 6, 2017

Mr. John Niland
Invenergy LLC
One South Wacker Drive
Suite 1800
Chicago, Illinois 60606

Subject: Clear River Energy Project
Burrillville, Rhode Island
GE Mobile Water Services

Dear Mr. Niland:

Confirming recent discussions with Amit Nadkarni, GE Mobile Water Inc. has provided mobile demineralizer services to more than fifty (50) power plants in the New England/New York territory during the past twelve (12) to eighteen (18) month period. Some of these customers require emergency service, and other customers have mobile demineralizer trailers parked at their site at all times, since they have no other source of demineralized water for the plant. In addition to mobile services, we also have water services agreements with nine (9) power plants in the New England/New York territory, including several nuclear power plants. For these sites, we own and operate the equipment and sell water by the gallon, to meet customer quantity and quality requirements.

Mobile demineralizer services have been utilized for over thirty (30) years, and our East Hartford Service Center in Connecticut has been regenerating trailers since 1992.

Although, due to the nature of this business, we cannot supply a detailed installation or customer list, our customers include NAES, NRG and National Grid. If needed, we can provide references that you can call, to get a better feel for our support capabilities.

We hope that this information will assist you with your evaluation. However, if you have any questions or need additional information, please call me.

Thank you and best regards,

Sincerely,

Craig H. Lockhart
Sales Manager - Mobile/BOO Services

CC: Amit Nadkarni – Invenergy LLC

EXHIBIT 3

2021 Final Build Weekday Morning Analysis

Traffic Impact Study - May 2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	115	260	0	0	0	112	0	123	7	144	56
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.92	0.92	0.92	0.93	0.93	0.93	0.85	0.85	0.85
Hourly flow rate (vph)	0	142	321	0	0	0	120	0	132	8	169	66
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			463			453	302	302	435	463	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			463			453	302	302	435	463	0
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.7	4.0	3.4
p0 queue free %	100			100			65	100	82	98	66	94
cM capacity (veh/h)	1636			1109			347	614	735	415	493	1068

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	463	120	132	8	235
Volume Left	0	120	0	8	0
Volume Right	321	0	132	0	66
cSH	1700	347	735	415	581
Volume to Capacity	0.27	0.35	0.18	0.02	0.41
Queue Length 95th (ft)	0	38	16	2	49
Control Delay (s)	0.0	20.8	11.0	13.8	15.4
Lane LOS		C	B	B	C
Approach Delay (s)	0.0	15.7		15.3	
Approach LOS		C		C	

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	152	3	8	66	94	0	1	0	219	2	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	2	190	4	10	82	118	0	1	0	274	2	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	200			194			366	417	192	359	360	141
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	200			194			366	417	192	359	360	141
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.5
p0 queue free %	100			99			100	100	100	54	100	99
cM capacity (veh/h)	1384			1392			584	525	855	592	565	849

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	196	210	1	282
Volume Left	2	10	0	274
Volume Right	4	118	0	6
cSH	1384	1392	525	595
Volume to Capacity	0.00	0.01	0.00	0.47
Queue Length 95th (ft)	0	1	0	64
Control Delay (s)	0.1	0.4	11.9	16.4
Lane LOS	A	A	B	C
Approach Delay (s)	0.1	0.4	11.9	16.4
Approach LOS			B	C

Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

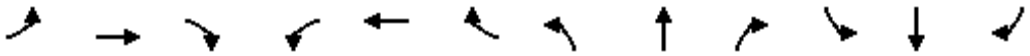
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	115	1	25	81	0	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.84	0.84	0.92	0.92
Hourly flow rate (vph)	144	1	30	96	0	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			145		300	144
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			145		300	144
tC, single (s)			4.3		6.4	6.8
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.8
p0 queue free %			98		100	99
cM capacity (veh/h)			1356		680	776

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	145	126	8
Volume Left	0	30	0
Volume Right	1	0	8
cSH	1700	1356	776
Volume to Capacity	0.09	0.02	0.01
Queue Length 95th (ft)	0	2	1
Control Delay (s)	0.0	2.0	9.7
Lane LOS		A	A
Approach Delay (s)	0.0	2.0	9.7
Approach LOS			A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	22.3%	ICU Level of Service	A
Analysis Period (min)	15		

2021 Final Build Weekday Afternoon Analysis

Traffic Impact Study - May 2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	135	183	0	0	0	187	0	148	16	128	162
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92	0.83	0.83	0.83
Hourly flow rate (vph)	0	153	208	0	0	0	203	0	161	19	154	195
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			361			530	257	257	418	361	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			361			530	257	257	418	361	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	100			100			31	100	79	95	73	82
cM capacity (veh/h)	1636			1208			296	650	784	426	567	1088

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	361	203	161	19	349
Volume Left	0	203	0	19	0
Volume Right	208	0	161	0	195
cSH	1700	296	784	426	774
Volume to Capacity	0.21	0.69	0.21	0.05	0.45
Queue Length 95th (ft)	0	117	19	4	59
Control Delay (s)	0.0	40.1	10.8	13.8	13.4
Lane LOS		E	B	B	B
Approach Delay (s)	0.0	27.1		13.4	
Approach LOS		D		B	

Intersection Summary				
Average Delay	13.6			
Intersection Capacity Utilization	55.3%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	119	3	56	128	165	2	7	0	195	23	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.90	0.90	0.90	0.80	0.80	0.80	0.85	0.85	0.85
Hourly flow rate (vph)	6	145	4	62	142	183	2	9	0	229	27	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	326			149			543	609	147	522	519	234
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	326			149			543	609	147	522	519	234
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			99	98	100	47	94	99
cM capacity (veh/h)	1245			1445			411	393	905	436	442	810

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	155	388	11	268
Volume Left	6	62	2	229
Volume Right	4	183	0	12
cSH	1245	1445	397	446
Volume to Capacity	0.00	0.04	0.03	0.60
Queue Length 95th (ft)	0	3	2	96
Control Delay (s)	0.4	1.6	14.3	24.5
Lane LOS	A	A	B	C
Approach Delay (s)	0.4	1.6	14.3	24.5
Approach LOS			B	C

Intersection Summary			
Average Delay	9.0		
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

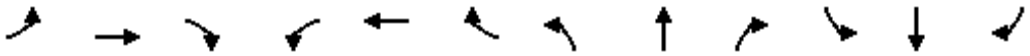
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	159	0	7	95	1	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.86	0.86	0.92	0.92
Hourly flow rate (vph)	199	0	8	110	1	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			199		325	199
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			199		325	199
tC, single (s)			4.7		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.7		3.5	3.4
p0 queue free %			99		100	97
cM capacity (veh/h)			1104		668	808

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	199	119	28
Volume Left	0	8	1
Volume Right	0	0	27
cSH	1700	1104	801
Volume to Capacity	0.12	0.01	0.04
Queue Length 95th (ft)	0	1	3
Control Delay (s)	0.0	0.6	9.7
Lane LOS		A	A
Approach Delay (s)	0.0	0.6	9.7
Approach LOS			A

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	20.8%	ICU Level of Service	A
Analysis Period (min)	15		

2021 Final Build Weekday Morning Analysis

January 2017 Memorandum



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	115	259	0	0	0	111	0	123	7	144	56
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.92	0.92	0.92	0.93	0.93	0.93	0.85	0.85	0.85
Hourly flow rate (vph)	0	142	320	0	0	0	119	0	132	8	169	66
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			462			452	302	302	434	462	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			462			452	302	302	434	462	0
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.7	4.0	3.4
p0 queue free %	100			100			66	100	82	98	66	94
cM capacity (veh/h)	1636			1110			347	614	735	416	494	1068

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	462	119	132	8	235
Volume Left	0	119	0	8	0
Volume Right	320	0	132	0	66
cSH	1700	347	735	416	581
Volume to Capacity	0.27	0.34	0.18	0.02	0.40
Queue Length 95th (ft)	0	37	16	2	49
Control Delay (s)	0.0	20.7	11.0	13.8	15.3
Lane LOS		C	B	B	C
Approach Delay (s)	0.0	15.6		15.3	
Approach LOS		C		C	

Intersection Summary				
Average Delay	8.0			
Intersection Capacity Utilization	49.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	152	3	8	66	93	0	1	0	222	2	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	2	190	4	10	82	116	0	1	0	278	2	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	199			194			365	416	192	358	359	141
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	199			194			365	416	192	358	359	141
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.5
p0 queue free %	100			99			100	100	100	53	100	99
cM capacity (veh/h)	1386			1392			584	526	855	592	565	850

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	196	209	1	286
Volume Left	2	10	0	278
Volume Right	4	116	0	6
cSH	1386	1392	526	596
Volume to Capacity	0.00	0.01	0.00	0.48
Queue Length 95th (ft)	0	1	0	65
Control Delay (s)	0.1	0.4	11.9	16.5
Lane LOS	A	A	B	C
Approach Delay (s)	0.1	0.4	11.9	16.5
Approach LOS			B	C

Intersection Summary			
Average Delay	7.0		
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		

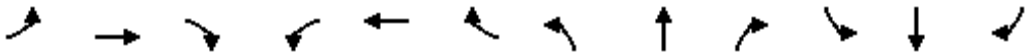
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	115	1	24	81	0	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.84	0.84	0.92	0.92
Hourly flow rate (vph)	144	1	29	96	0	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			145		298	144
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			145		298	144
tC, single (s)			4.2		6.4	6.7
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.8
p0 queue free %			98		100	99
cM capacity (veh/h)			1372		683	790

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	145	125	7
Volume Left	0	29	0
Volume Right	1	0	7
cSH	1700	1372	790
Volume to Capacity	0.09	0.02	0.01
Queue Length 95th (ft)	0	2	1
Control Delay (s)	0.0	1.9	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	1.9	9.6
Approach LOS			A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	22.3%	ICU Level of Service	A
Analysis Period (min)	15		

2021 Final Build Weekday Afternoon Analysis

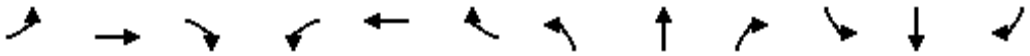
January 2017 Memorandum



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	135	182	0	0	0	190	0	148	16	128	162
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92	0.83	0.83	0.83
Hourly flow rate (vph)	0	153	207	0	0	0	207	0	161	19	154	195
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			360			529	257	257	418	360	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			360			529	257	257	418	360	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	100			100			30	100	79	95	73	82
cM capacity (veh/h)	1636			1210			296	651	784	427	568	1088

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	360	207	161	19	349
Volume Left	0	207	0	19	0
Volume Right	207	0	161	0	195
cSH	1700	296	784	427	775
Volume to Capacity	0.21	0.70	0.21	0.05	0.45
Queue Length 95th (ft)	0	121	19	4	59
Control Delay (s)	0.0	40.9	10.8	13.8	13.4
Lane LOS		E	B	B	B
Approach Delay (s)	0.0	27.7		13.4	
Approach LOS		D		B	

Intersection Summary				
Average Delay	13.8			
Intersection Capacity Utilization	55.4%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	119	3	56	128	168	2	7	0	198	23	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.90	0.90	0.90	0.80	0.80	0.80	0.85	0.85	0.85
Hourly flow rate (vph)	6	145	4	62	142	187	2	9	0	233	27	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	329			149			544	612	147	524	521	236
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	329			149			544	612	147	524	521	236
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			99	98	100	46	94	99
cM capacity (veh/h)	1242			1445			410	391	905	435	441	808

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	155	391	11	272
Volume Left	6	62	2	233
Volume Right	4	187	0	12
cSH	1242	1445	395	445
Volume to Capacity	0.00	0.04	0.03	0.61
Queue Length 95th (ft)	0	3	2	100
Control Delay (s)	0.4	1.6	14.4	25.0
Lane LOS	A	A	B	D
Approach Delay (s)	0.4	1.6	14.4	25.0
Approach LOS			B	D

Intersection Summary			
Average Delay	9.2		
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	159	0	6	95	1	24
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.86	0.86	0.92	0.92
Hourly flow rate (vph)	199	0	7	110	1	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			199		323	199
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			199		323	199
tC, single (s)			4.6		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.7		3.5	3.4
p0 queue free %			99		100	97
cM capacity (veh/h)			1133		671	815

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	199	117	27
Volume Left	0	7	1
Volume Right	0	0	26
cSH	1700	1133	808
Volume to Capacity	0.12	0.01	0.03
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.5	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.5	9.6
Approach LOS			A

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		19.9%	ICU Level of Service A
Analysis Period (min)		15	

EXHIBIT 4

Clear River Energy Center - Burrillville, Rhode Island
Truck Trip Emissions
Annual Emissions Summaries

Construction Truck Emissions (tons)	**VOC**	**THC**	**CO**	**NOx**	**PM2.5**	**PM10**	**CO2**
Year 1	1.97	2.04	15.96	5.64	0.10	0.11	919
Year 2	7.55	7.81	62.31	16.39	0.27	0.30	2,610
Total	9.52	9.85	78.27	22.03	0.37	0.42	3,529

Operations Truck Emissions (tons)	**VOC**	**THC**	**CO**	**NOx**	**PM2.5**	**PM10**	**CO2**
Annual	1.01	1.05	8.25	2.90	0.05	0.06	458

EXHIBIT 5

INVENERGY CLEAR
RIVER ENERGY CENTER

INTERSECTION REVIEW

Church Street at Main Street, Pascoag, RI

Prepared by

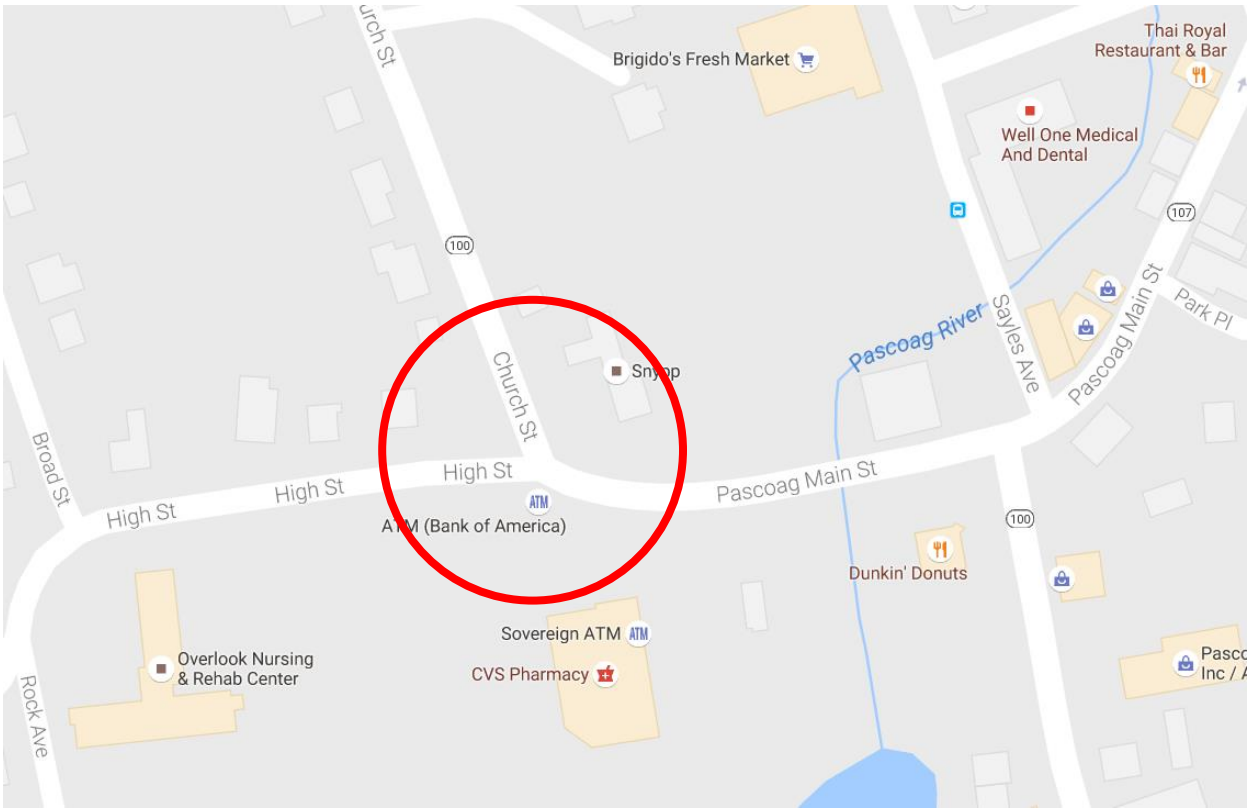
McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

McMahon Associates
55 Dorrance Street, Suite 403
Providence, RI 02903

Based on feedback received at the Burrillville Planning Board meeting of August 15, 2016, we have investigated the intersection of Church Street and Main Street in Pascoag. This intersection is located along the truck route that will likely be utilized by construction vehicles accessing the Invenergy site proposed off of Wallum Lake Road.

It was mentioned by both the Planning Board and the general public that a tight curve at the intersection of Church Street and Main Street may inhibit passage of large truck traffic. McMahon Associates has performed an investigation of conditions at this intersection and our findings are detailed below.

Church Street, Pascoag Main Street, and High Street form an intersection opposite the CVS Pharmacy in the Pascoag section of Burrillville. Pascoag Main and High run east to west and are uncontrolled through movements in the intersection. Pascoag Main and Church, however form Rhode Island Route 100, with Church Street running south to north. Church Street is stop controlled on its southbound approach to Pascoag Main/High. The CVS entrance forms a fourth leg of the intersection, opposite Church.



It is anticipated that trucks heading to the site will travel west on Pascoag Main Street, and turn right onto Church, following Route 100 north. Upon return, they will follow Route 100 south by heading south on Church, then take the stop controlled left onto Pascoag Main. These are the two movements we have evaluated.

It should be noted we were unable to obtain detailed plans of this intersection from RIDOT within the study timeframe. Findings were obtained from field observations, and utilizing Google Maps aerial information. A site visit was conducted on the morning of August 18, 2016 under ideal weather conditions. At that time no tractor trailer type vehicles were observed in the intersection. However, several large 10 wheel dump trucks and vehicles pulling trailers were observed traversing the intersection. All did so with no difficulty, including the movements noted above.

In order to represent the wheel patterns of a tractor trailer we have utilized Autoturn templates over a google image of the intersection. The tractor trailer (WB-50 design vehicle) can maneuver the turns at this intersection, however, there is encroachment into the opposing lanes. For the stop controlled southbound Church to Pascoag Main Street move this encroachment is minor, with the projected wheelpath just over the centerline for a short distance. For the northbound Route 100 movement (Pascoag Main to Church), a more significant encroachment is shown (reference attached Autoturn diagrams 1 – 3)

It should be noted, that when using the turning templates it is not uncommon to see encroachment outside of travel lanes, particularly along older roadways in the northeast. In addition, the templates are somewhat conservative, and the majority of professional truck drivers can easily maneuver within the wheelpaths shown in the templates. For this northbound Route 100 movement, 2 scenarios were depicted, varying the location where the driver would start to swing around the corner. Both showed encroachment to within the majority of the oncoming lane. For comparison purposes, an Autoturn simulation was also performed for a standard full sized school bus (S-BUS-36) and it also showed encroachment into the opposing lane at this intersection. Fortunately, Church Street southbound is stop controlled, and there is an upgrade on Pascoag Main Street approaching the intersection, so speeds are low on those approaches. In addition, traffic volumes are quite low, reducing the opportunity for conflict.

If the Town desires to improve conditions at this intersection, the radius in the northeast corner of the intersection could be increased to eliminate the need for the northbound tractor trailer to travel in the opposing lane when making this turn. However, this would require right-of-way acquisition in order to rebuild the curb and sidewalk further back from its existing location. Physically there is room to accomplish this widening within a small landscaped area in front of the Echo Plaza, without impacting plaza parking spaces. Utility impacts could be limited to relocation of one fire hydrant. It should be noted that there is also ledge visible on the opposite side of the intersection, so some ledge excavation could also be required.

With just this minor widening, tractor trailers (WB-50 design vehicles) appear to have enough room to negotiate this corner without any significant encroachment into the oncoming lane (reference Autoturn diagram 4).

It should be noted that increasing the curb radius could potentially result in increased travel speeds for smaller vehicles at this intersection, since motorists would be able to more smoothly complete the westbound to northbound movement. To reduce the potential for speed increases, a truck apron could be added in the northeast corner within the widened area. In other words, the corner radius of the curb and sidewalk would be increased, but the added pavement would be of a different look and feel (similar to what is typically provided at a roundabout). This would accommodate a truck wheel base but is less inviting to smaller vehicles. These minor improvements could benefit all larger wheelbase vehicles utilizing the existing intersection configuration, including school buses.

J:\Analysis\Adler Pollack Sheehan\Invenergy Burrillville\Drawings\AutoTurn\Invenergy Burriville - AutoTurn.dwg 08/17/16

WB-50	feet		
Tractor Width	8.00	Lock to Lock Time	6.0
Trailer Width	8.50	Steering Angle	17.7
Tractor Track	8.00	Articulating Angle	70.0
Trailer Track	8.50		

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

AUTOTURN 1
WB-50 SOUTHBOUND LEFT
CHURCH ST AT PASCOAG MAIN ST
BURRIVILLE, RHODE ISLAND

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WB-50	feet		
Tractor Width	8.00	Lock to Lock Time	6.0
Trailer Width	8.50	Steering Angle	17.7
Tractor Track	8.00	Articulating Angle	70.0
Trailer Track	8.50		

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TRANSPORTATION ENGINEERS & PLANNERS

AUTOTURN 2
WB-50 WESTBOUND RIGHT
CHURCH ST AT PASCOAG MAIN ST
BURRIVILLE, RHODE ISLAND

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WB-50	feet		
Tractor Width	8.00	Lock to Lock Time	6.0
Trailer Width	8.50	Steering Angle	17.7
Tractor Track	8.00	Articulating Angle	70.0
Trailer Track	8.50		

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AUTOTURN 3
WB-50 WESTBOUND RIGHT
CHURCH ST AT PASCOAG MAIN ST
BURRIVILLE, RHODE ISLAND

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WB-50	feet		
Tractor Width	8.00	Lock to Lock Time	6.0
Trailer Width	8.50	Steering Angle	17.7
Tractor Track	8.00	Articulating Angle	70.0
Trailer Track	8.50		

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TRANSPORTATION ENGINEERS & PLANNERS

AUTOTURN 4
WB-50 WESTBOUND RIGHT WITH IMPROVEMENTS
CHURCH ST AT PASCOAG MAIN ST
BURRIVILLE, RHODE ISLAND