September 16, 2016

Burrillville Town Council
Town of Burrillville
100 Main Street
Harrisville, RI 02830

Re: Clear River Energy Center EFSB Review

Dear Council Members:

At your request, CDR Maguire and Alares LLC (Alares) have reviewed the permit application and related documents submitted to the Rhode Island Energy Facility Siting Board (EFSB) by Invenergy for the Clear River Energy Center.

EXECUTIVE SUMMARY

On October 29, 2015 Invenergy submitted an application to the EFSB to construct the Clear River Energy Center (CREC) in Burrillville. The proposed facility will be constructed on Wallum Lake Road adjacent to the Spectra Energy gas compressor station. The facility will consist of two combined-cycle generation stations that will be primarily fueled with natural gas and will also be capable of using ultra-low sulfer diesel fuel as a back-up fuel when natural gas is not available. The facility will have a nominal output of approximately 850 – 1,000 megawatts (MW).

CDR Maguire and Alares have reviewed the EFSB application and supplemental information supplied to the EFSB by Invenergy. We have also assisted the Town in making Data Requests to the EFSB and reviewed the responses provided by Invenergy to these Data Requests. We have reviewed the following issues that may impact the Town:

- Traffic
- Sewer
- Stormwater
- Wetland & Wildlife
- Process Water
- Storage of Hazardous Materials

Based on our review of these issues CDR Maguire recommends the following:

- Invenergy has proposed a land acquisition and roadway widening at the Church Street and Main Street intersection to mitigate traffic impacts. CDR Maguire recommends that this mitigation with approval of RIDOT and the Town be performed as a condition of the project.
- Invenergy has agreed to obtain an industrial wastewater user permit from the Burrillville Sewer Commission. CDR Maguire recommends that this be performed as a condition of the project.
- Invenergy refers to a “Preliminary Stormwater Management Plan for CREC” in the Addendum they submitted to the EFSB. CDR Maguire recommends that this plan be provided by Invenergy for review by the Town.

- Construction of the CREC access road will have significant impacts to wetlands. CDR Maguire recommends that Invenergy be required to share the existing access road with Spectra Energy to reduce wetland impacts.
- With the Pascoag Utility District decision to not supply water for the project, Invenergy needs to identify a process water source. CDR Maguire recommends that the water source be identified and evaluated prior to proceeding with further review of the Invenergy application.
- If the contaminated water from the PUD wells is to be used for the project, CDR Maguire recommends that Invenergy be required to demonstrate that this will have no adverse hydraulic impacts to the aquifer that supplies water to the Harrisville Water District. Invenergy should demonstrate that there treatment systems will be adequate to remove contaminants. Conditions in the aquifer should be carefully monitored and contingencies should be in place to mitigate any impacts from the migration of residual contamination.
- Although the CREC is not subject to regulations that will require them to prepare a Risk Management Plan (RMP) Invenergy has agreed to conduct the analysis for a facility wide RMP. CDR Maguire recommends that the CREC be required to prepare a RMP for the facility as a condition of approval.

RECOMMENDATION

In addition to the recommendations stated in the Executive Summary, CDR Maguire does not believe the information supplied by Invenergy is complete and adequate to review the CREC project. A source of process water has not been identified; wetland impacts and mitigation are not clearly defined; and stormwater issues have not been addressed. Based on the information submitted and reviewed, CDR Maguire does not recommend that this project proceed.

PROJECT SUMMARY

On October 29, 2015 Invenergy submitted an application to the EFSB to construct the Clear River Energy Center in Burrillville. The proposed facility will be constructed on Wallum Lake Road adjacent to the Spectra Energy gas compressor station. The facility will consist of two combined-cycle generation stations that will be primarily fueled with natural gas and will also be capable of using ultra-low sulfer diesel fuel as a back-up fuel when natural gas is not available. The facility will have a nominal output of approximately 850 – 1,000 megawatts (MW).

The CREC will be fueled with natural gas to be supplied from Spectra Energy, when natural gas is not available the facility will be capable of running on ultra-low sulfer diesel fuel. During extreme cold weather the natural gas supply may not be adequate to supply gas for the CREC. It is our understanding that Invenergy will have a contract that guarantees a continuous supply of natural gas for one of the 500 MW turbines, the other turbine will be run on ultra-low sulfer diesel fuel when gas is not available. Diesel fuel will be stored in two one million gallon on-site tanks, delivery of diesel fuel will be by standard tanker trailer trucks carrying approximately 8,000 gallons per truck.

In their application Invenergy proposed to utilize water from the Pascoag Utility District (PUD) Well #3A for the proposed power plants process water, potable water will be provided to the plant from a potable water source. At this time, the PUD does not intend to supply water for the project, Invenergy has said they have other water sources, these sources have not been revealed to the EFSB. Well 3A was closed in 2001 due to petroleum contamination including methyl tert-butyl ether (MTBE) from an off-site gasoline

storage tank. The plant will require approximately 104,000 gallons per day (gpd) (72 gpm) firing natural gas under normal full-load conditions, in the summer the plant will require approximately 225,000 gpd (156 gpm). During periods when the plant is firing oil, expected for periods of time during the winter months, the daily water demand will increase to 925,000 gpd (642 gpm).

Invenergy is proposing to discharge wastewater to the Burrillville Sewer Treatment facility. Wastewater will include the wastewater generated from the high purity treatment process; blowdown from the steam generators and evaporative coolers; housecleaning; and sanitary wastewater from the staff. Wastewater will be pumped from the site to a Burrillville sewer manhole on Wallum Lake Road. Typical daily flows will vary between 69,000 gpd to 89,000 gpd with peak flows of 200,000 gpd when the plant is fired with oil.

CDR Maguire and Alares have reviewed the EFSB application and supplemental information supplied to the EFSB by Invenergy. We have also assisted the Town in making Data Requests to the EFSB and reviewed the responses provided by Invenergy to these Data Requests. We have reviewed the following issues that may impact the Town:

- Traffic
- Sewer
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- Storage of Hazardous Materials

TRAFFIC

Invenergy had a traffic study performed to evaluate traffic impacts from the project during construction and during operation of the proposed facility. “Traffic Impact Study for the Clear River Energy Center” dated May 2016, was prepared by McMahon Traffic Engineers and Planners. The study identified traffic impacts during construction with an increase of more than 400 vehicles during peak hours due to construction employee traffic and trucks delivering equipment and supplies to the project. These impacts included delays at the intersection of South Main Street and Pascoag Main Street and the intersection of Church Street with Pascoag Main Street.

After completion of construction, the facility will generate less than 40 vehicles during peak hours, these vehicles will include employee’s and deliveries of supplies to the facility. This traffic will have minimal impact to the traffic.

CDR Maguire generally agrees with the findings of the McMahon Traffic Study and concludes there will be noticeable traffic delays during the construction phase of the project. During the underground portion of the Full Notice to Proceed Phase (the full notice to proceed phase would last about six months), more than 400 additional vehicles per peak hour may be expected. The majority of this traffic would access the site through the village of Pascoag.

Larger trucks will have difficulty navigating turns at the intersections of Pascoag Main Street with Church Street and with South Main Street. This is not a new situation or an unmanageable one, given that the current traffic counts reflect a 1-2% occurrence of large trucks here. But this will clearly cause temporary traffic delays from time to time. There's little beyond the intersection modification cited above that could be done to these intersections to improve their capability to accept the increased volumes or accommodate large vehicle turning movements.

During operation of the facility there will be a minor increase in traffic on local roads as the facility will generate around 33 vehicles per peak hour; far less during off peak times. We believe this will increase the peak hour volumes by about 15% in the morning peak hour and by about 12% in the evening peak. Overall, daily traffic on Wallum Lake Road will increase by about 4%, and on Pascoag Main Street by less than 2%.

SEWER

The EFSB application includes a summary of the discharge parameters anticipated, the projected maximum discharge parameter for MTBE is 200 micrograms per liter (µg/l). One microgram per liter (µg/l) is equal to one part per billion (ppb). Table 6.2-2 from the EFSB application summarizes the well water and wastewater discharge parameters. These parameters were based on the use of the Pascoag Utility District (PUD) Well 3A for process water. While the PUD does not currently intend to supply water for the project, our comments would be applicable for other water sources. CDR Maguire reviewed the impacts of the CREC process water on the operation of the sewer treatment plant and on the discharge from the sewer treatment plant to the Clear River.

Background. Clear River Energy Center indicates that the water to be used in the process of producing electricity will be obtained from the Pascoag Utility District. The well that will produce the water is contaminated with Methyl-Tertiary-Butyl-Ether (MTBE) is proposed to be treated to a maximum concentration of 55 µg/l prior to delivery to the power plant.

As part of the evaluation for their submittal, pre and post concentrations of 32 parameters have been summarized in Table 6.2-2. Table 6.2-2 also states the applicability of regulations to those parameters. As seen in Table 6.2-2 the projected concentration in the wastestream is different than in the water from the well. This is attributed to reactions that occur during the high purity treatment process and in the production of the energy.

Invenergy states in the EFSB permit application that the MTBE levels in the sewer discharge will be below 200 µg/l at a temperature below 140 degrees F. The major questions are will the discharge be harmful to the operation of the plant and will the quality of the discharge affect the Town's wastewater discharge permit.

Recommendations

Based on the fact that the full effects of MTBE on the treatment plant and the discharge are not fully known, we recommend that the Town develop a method for protecting itself. The typical method for establishing this kind of protection is through the development of an Industrial Users Permit (IUP). An IUP will allow the Town to set enforceable limits on the discharge from the Clear River Energy Center

and also protect itself in the future if the discharges affects the current processes at the wastewater plant and regulations or treatment technologies change. In their response to Data Request 4-16, Invenergy has agreed to apply for an Industrial Wastewater Discharge Permit from the Burrillville Sewer Commission.

For the elimination of possible odors, we recommend that a maximum level of MTBE in the discharge be capped at 20 to 40 µg/l.

It is our understanding that the sewer commission has available capacity to receive the discharge from the project. On an average basis, the sewer commission will see an increase of approximately 10% to the quantity of the flow. This will result in an equivalent increase in revenue. This assumes that no additional treatment processes are required.

The sewer commission can protect the ability to control the quality of the process water from the applicant through the use of an Industrial User Permit and their sewer use ordinance. This process allows the sewer commission to work with DEM to develop enforceable water quality guidelines that must be complied with or fines will be incurred.

The discharge from the wastewater treatment plant to the river is governed by the State of Rhode Island and the US Environmental Protection Agency. Every 5 years the discharge permit for the treatment plant is reviewed and subsequent changes can occur. Many times, the periodic changes require modifications to the operation of the system to maintain compliance with the permit. This unknown and possibly impending regulation change could cause additional expenditures if the new discharge has a newly regulated contaminant present in the discharge and modifications must be made at the plant. This concern can be offset with a well written Industrial User Permit outlined above.

STORMWATER

The plans provided with the EFSB application indicated three stormwater detention ponds, no other drainage elements are indicated on the plans. These plans are not suffuicient to address the projects stormwater needs, plans are needed that clearly indicate what is being done to collect, detain, and treat stormwater on the site. The Addendum submitted to the EFSB on August 30, 2016 refers to a “Preliminary Stormwater Management Plan for Clear River Energy Center” this Plan was not included in the Addendum submittal, CDR Maguire recommends that the Town initiate a Data Request to obtain a copy of this document for review.

Development of the site will include increasing the impervious surface area resulting in increased stormwater run-off from the site, the developer will be required to treat and detain the run-off to avoid impacts to the areas receiving the run-off. The RIDEM Stormwater Design and Installation Standards Manual provides guidance for evaluating impacts of development and designing drainage elements to address these impacts. The developer will be required to prepare a stormwater plan to evaluate the impacts and design a drainage system that will address the impacts of the development.

WETLANDS & WILDLIFE IMPACTS

Invenergy submitted an Addendum to their EFSB permit application to address wetland issues related to the proposed facility. In the initial submission, CREC had proposed a new improved roadway to pass directly through wetlands, a 67 acre potential construction laydown area within portions of Wetland "1" and the facility and support elements (e.g., 345kV transmission ROV, supply lines, wastewater pipelines). The overall permanent impacts to wetlands would be on the order of approximately 2.4 acres of direct impact. This is in addition to the impacts proposed by the 67 acre potential construction laydown. The original application stated that there would be a permanent loss of forested wetland of 1.53 acres and the total wetland fill of 1.24 acres. Also that additional temporary impact to wetlands could be required for the construction of the facility. The difference between the original application and addendum of impact to wetland is approximately 0.37 acres, although plans do not reflect a change in footprint or construction impacts and the table present on the summary of impacts is consistent with the original application impacts. The impacts to the special aquatic site should be considered as part of the overall impacts since the functions of the area would be inhibited and would stop acting as a vernal pool.

Some inconsistencies with addendum include the description of impacts of wildlife value. The fragmentation of habitat caused by the installation of the generation facility and roadway are described as indirect impacts, though the removal of the habitat for the creation of this facility is actually a direct impact caused by the facility.

Stormwater and flood protection is stated as a primary function of both Wetland 1 and 2 and there is permanent fill being placed into these wetlands. In accordance with the RIDEM regulations flood storage compensation needs to be recreated within the same area of the watershed to provide for proper flood compensation.

On Page 20 of the Addendum states that the facility is designed to not divert surface waters which could adversely affect wetland hydrology. Wetlands are part of groundwater recharge within the landscape. The addendum states that since it is drawing water from a non-community water supply (PUD 3A), it is limiting the draw of potable water. However, the only reason why PUD 3a is non-potable is due to contamination reasons. The water which feeds this is still from the general surrounding area and is not separated from the water which is contributed by the Dry Arm Brook and Iron Mine Brook. The depletion of any water supply which is connected hydrologically such as PUD 3A, could still have an adverse effect on the wetland hydrology if too much water is withdrawn. Therefore, this impact is improperly represented.

The addendum does address the national standards for compensatory wetland mitigation, and does acknowledge that these national standards are not state accepted mainly due to the fact that we as a region do not have much in the way of compensatory mitigation banking or in-lieu fee services. These compensations are essentially where an applicant pays its way out of permanent wetland impacts. The ACOE will require mitigation and avoidance close to the same level to which the state requires, and

could potentially have additional concerns over the secondary impacts which this project will have. The compensation required for the wetlands through ACOE for the 0.61 acres at a 2:1 or 3:1 compensation rate would be close but possibly not as protective or restorative as the state's 1:1 wetland replication or restoration mitigation. The state's mitigation includes all perimeter wetland area in it compensation requirements. This would be on the order of the entire 2.4 acres of wetlands disturbed as opposed to the 1.8 acres that ACOE may require. Therefore this would be less mitigation done by the applicant then the states requirement.

Further Recommendations:

Overall the wetland replication and mitigation are still not determined and the overall minimization of impacts to the wetlands seems like it could be further avoided. Sharing the driveway with Spectra with the plans of a future partnership do not seem out of reason and would prevent much of the permanent fill which is needed as part of this project. This partnership is still encouraged and should try to be further explored.

Total water withdrawal from the overall aquifer including those non-potable resources should be further analyzed since those surface water which contribute to the recharge of that well could be impacted by that well going back online. This could impact the wetlands on-site further by creating a quicker draw down of the aquifer and surface water infiltrating at higher rates due to dropping groundwater levels.

Overall the addendum does not clearly identify measures to mitigate impact to wetlands and wildlife. The addendum states the need for an ACOE permit which would then place federal mitigation parameters on the project. There is no clarity on how the mitigation would be conducted or where.

PROCESS WATER

The CREC facility requires a supply of water to provide makeup for steam generation, cooling and other applications. Because the proposed facility is designed to utilize air-cooled condensers (rather than water-cooled) the total water requirements are reduced. Water is proposed to be supplied from the Pascoag Utility District (PUD) Well #3/3A that has been out-of-service since 2001 due to contamination of the PUD wellfield with gasoline fuel contamination. To facilitate the use of water from PUD Well #3/3A, Invenergy proposes to provide a groundwater treatment system using granular activated carbon (GAC) for removal of organic contaminants including MTBE, BTEX compounds, TBA, etc.

The pre-treated groundwater would be pumped from the PUD wellfield in a 10"Ø HDPE transmission pipeline. This pipeline, approximately 13,558 feet in total length, would extend from a point of connection at Silver Lake Avenue along Grove Street, Laurel Hill Avenue, Church Street and Wallum Lake road (RI Rt. 100) to the CREC facility. Invenergy projects an average water demand of 102,240 gpd (0.102 MGD), with a summer load demand of 224,640 gpd (0.225 MGD). When firing with diesel fuel in the winter, the water demand is anticipated to be 924,489 gpd (0.925 MGD). Documents filed by Invenergy indicate that the CREC facility is expected to be firing with diesel fuel for 5 days per year (winter) although up to 45 diesel firing is requested. The pre-treated water produced from PUD Well

#3/3A will be non-potable, and will remain totally segregated from the municipal water distribution system. Invenergy will construct a dedicated public water supply well at the CREC site to provide potable water to the facility.

The CREC facility will generate process wastewater including blowdown from steam generators and evaporative coolers, reject and backwash wastewater from the high purity water treatment systems, cleaning and sanitary wastewater. This wastewater shall be discharged via a 4"Ø HDPE force main extending approximately 8,570 ft. along Wallum Lake Road, to a point of connection into the existing municipal sewer, approximately 30 ft. west of the intersection with Old Wallum Lake Road, in Pascoag, RI. Invenergy projects an average wastewater discharge volume of 69,120 gpd (0.069 MGD), with a summer discharge volume of 89,280 gpd (0.089 MGD). When firing with diesel fuel in the winter, the wastewater discharge is anticipated to be 200,160 gpd (0.200 MGD).

Review Team Comments and Recommendations

The historic production of Well 3/3A is approximately 500 to 600 gpm. For the majority of the year, the demand at the plant would be about 104,000 gpd. During the summer months, due to additional water being required for cooling, the demand would be 224,000 gpd. Providing that Well 3/3A was appropriately redeveloped, and could provide a yield that is in the range that it formerly provided, this water supply would be suitable with the proposed treatment system.

What is unclear is when there is a higher demand for process water related to the operation of the plant on fuel oil? This would be during winter months when the demand for natural gas required that the plant be operated on fuel oil. As presented in the October 2015 EFSB application,

> *Modern combined cycle electric generating facilities in New England are primarily fueled by natural gas and at times in the winter when natural gas supplies are under severe stress some electric generation plants are required by the electric grid operator, New England Independent System Operator (ISO-NE), to fire distillate oil to conserve the natural gas supplies for home heating and commercial use. (October 2015 EFSB Application, Page 45)*
>
> *During the infrequent periods when the Facility is requested to fire one of the gas turbines on oil, the daily water demand for the Facility will increase to approximately 925,000 gpd, or 0.925 MGD for each day of oil firing. Although the total water use of the Facility increases when firing ultra low sulfur diesel (ULSD) oil, the total number of days that the Facility will be required to fire oil will typically be determined by the grid operator (ISO-NE) based on the severity of winter conditions when there is a need to conserve natural gas for heating needs of the region. Generally, based on history, the number of days per year the Facility will be requested to use ULSD will be approximately five days. (October 2015 EFSB Application, Page 18)*

Aside from the obvious water supply issue, it is unclear if the five day duration is accurate. As stated on Page 51 of the October 2015 EFSB application.

> *To put the above in perspective, over the last five years with the current limited pipeline capacity into the region, there has been an average of only five days per year when gas fired electric generation was asked to switch to distillate oil. Five days per year means, if the Project had existed for the last five years, that the Project would have fired natural gas 98.6% of the time, and as a result, the Project's daily water use and wastewater discharge would have been in the range of 102,240 gpd and 69,000 gpd respectively 98.6% of the year. Projecting forward with the natural gas pipeline expansions underway, the total annual days of Project oil firing should lessen with the increasing supplies of natural gas helping to reduce winter shortage of this critical fuel to the region.*

If this is the case, then Alares requests that Invenergy provide a confirmation from ISO-NE that this information is accurate. We understand that the plant can operate in this condition for as long as 3.6 days based on information provided by John Niland of Invenergy. Would the expected days be consecutive or not? Please provide information for operating in this condition for the last five years.

Other recommendations and comments regarding the reactivation of Well 3/3A are provided in the below sections.

It should be demonstrated that the reactivation of Well #3A should have no hydraulic impact on the operation of the Eccleston Well Field for Harrisville Water District. Harrisville Water District has recently undertaken this modeling initiative with an independent engineer and available information indicates that information may be ready as soon as early August 2016. Alares has not been provided this information but we understand that the Harrisville Fire District rejected Invenergy's request for water during August 2016.

The groundwater conditions should be modeled to establish if the reactivation of Well #3A would potentially introduce air impacts to the residential properties in the vicinity of Well #3A. Due to the time necessary to reach equilibrium conditions in the aquifer, in the vadose zone soil gas, and potentially indoor air; it may be likely infeasible to conduct a pump test of sufficient duration to assess these conditions. In the event that an impact is identified post Well #3A activation, contingency arrangements should be in place by CREC for assessment and mitigation of indoor air intrusion, as necessary to protect human health.

It should be demonstrated that the reactivation of Well #3A will have no impact on the low flow stream conditions of the Clear River.

During August 2016, Alares reviewed a preliminary groundwater treatment process and instrumentation diagram (P&ID) issued the CREC Design Team. It detailed the proposed flow rates, the design criteria, and the system components. The treatment system is industry standard and provided that it is constructed and operated appropriately, it will be capable of removing petroleum constituents in groundwater to non-detect laboratory limits consistent with EPA Method 8260 analysis. It was a

preliminary design and it did not include a proposed building size. Alares recommends that treatment and mechanical redundancy should be factored into the design.

Supplemental sources for process water should be proposed by the CREC Design Team in addition to the reactivation of Well #3A. These may include additional groundwater sources, surface water sources, or interconnections with other municipalities. Alares understands that PUD has withdrawn the Letter of Intent to provide water to Invenergy. Invenergy claims that there is a third option for a process water supply. However, at the date of this letter, that third option has not be presented to Alares for review.

Consideration should be given to discharging a portion or the majority of the spent process water from the proposed CREC plant to an upgradient location on the Clear River. Treatment will likely be required as the proposed CREC plant to facilitate this sustainable water reuse option.

STORAGE OF HAZARDOUS MATERIALS

Aqueous ammonia for the gas turbine selective catalytic reduction ("SCR") systems will be stored at 19% concentration in a 40,000 gallon aboveground storage tank. The EPA requires facilities that store 10,000 pounds or more of aqueous ammonia which is stored at a concentration of 20% or greater to conduct an off-site consequence analysis and prepare a Risk Management Plan (RMP) to prevent and mitigate the consequences of accidental releases. The RMP does not apply to aqueous ammonia stored at a concentration of less than 20% in any amount.

The Facility will not be subject to the RMP requirements, but will be subject to the EPA's General Duty Clause, which requires facilities to access hazards, prevent accidental releases, and minimize the consequences of any releases which occur. Consistent with the General Duty Clause, Invenergy is proposing the following to ensure the safe storage of aqueous ammonia on-site, and to minimize the consequences in the unlikely event that an accidental ammonia release were to occur:

- The ammonia storage tank and its associated transfer pumps and piping will be enclosed within a concrete containment area designed to contain up to 110% of the capacity of the storage tank.
- The containment area will be filled with a passive evaporative control system designed to reduce the exposed surface area of any ammonia within the containment system by at least 90%.
- The containment area will be equipped with ammonia sensors to alert Facility operators of any system leaks.
- Procedures will be established and documented for the periodic maintenance, inspection and testing of the containment area, the leak detection system, and the evaporative control system.
- Emergency procedures will be established and documented, including the training of staff in the procedures and the proper use of the personal protective equipment which would be required during a release.
- Invenergy will coordinate with local emergency responders and the nearest hazardous materials response team to establish emergency procedures in the unlikely event of a release of ammonia from the Facility.

Acute Exposure Guideline Levels ("AEGLs") are used by emergency planners and responders as guidance in dealing with accidental releases of chemicals into the air. AEGLs are expressed as concentrations of airborne chemicals at which health effects may occur and are designed to protect the elderly and children, as well as other individuals who may be susceptible.

AEGL levels are dictated by the severity of the toxic effects caused by the exposure, as follows:

- AEGL-1 (Level 1): Notable discomfort, irritation, or certain asymptomatic non-sensory effects. Any effects are not disabling and are transient and reversible upon cessation of exposure.
- AEGL-2 (Level 2): Irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.
- AEGL-3 (Level 3): Life-threatening health effects or death.

Airborne concentrations below the AEGL-1 are exposure levels which could produce mild, transient, odor, taste, and sensory irritation. These effects are non-disabling, allowing for safe evacuation from any impacted areas.

For ammonia, the 1-hour AEGL concentrations have been defined as follows:

- AEGL-1: 30 parts per million (ppm)
- AEGL-2: 160 ppm
- AEGL-3: 1,100 ppm

Although the CREC is not subject the Risk Management Program, a worst-case accidental release scenario has been evaluated to assess the potential consequences in the extremely unlikely event of a release of the full 40,000 gallons of 19% aqueous ammonia into the containment area. This assessment was performed using the Area Locations of Hazardous Atmospheres ("ALOHA") Model developed by the EPA and the National Oceanic and Atmospheric Administration and included as a prescribed technique under the Risk Management Program. It was completed in accordance with the procedures contained in the EPA's "Risk Management Program Guidance for Offsite Consequence Analysis".

The analysis was first conducted without and then with the proposed passive evaporative control system. The results of the worst-case accidental release scenario assessment completed for the CREC aqueous ammonia storage tank are shown in both tabular and graphical form in **Exhibit 1 (Attached to this document)**.

Based on the ALOHA modeling results, the furthest downwind distances from the ammonia storage tank at which the in-air ammonia concentrations would exceed each of the ammonia AEGL levels during a worst-case accidental release are as follows:

AEGL Level

	w/o Evaporative Controls	w/ Evaporative Controls
AEGL-1	389 yards	121 yards
AEGL-2	174 yards	53 yards
AEGL- 3	64 yards	20 yards

As shown on the figures in **Exhibit 1**, all of the areas in which the inair ammonia concentration would exceed the AEGL-1 level are within the Project and/or Spectra site, which is private property not accessible to the general public. Emergency procedures will be established to evacuate Algonquin (Spectra) and CREC personnel from these areas in the event of a release and to require emergency personnel to utilize the proper personal protective equipment before entering these areas until the released ammonia has been properly recovered.

The in-air ammonia concentrations in all areas beyond the Spectra site during a worst-case accidental release would be below the AEGL-1 level, thus resulting in no adverse health effects upon exposure.

On September 12, 2016, RIDOH issued a final Advisory Opinion to the EFSB that included a review of the ALOHA information presented above. RIDOH's opinion was that some of the model inputs used in the ALOHA analysis were inappropriate, and as a results, the distance to the toxic endpoints were substantially underestimated.

Although there would be no public health risk, Invenergy will work with local emergency responders to establish emergency procedures in the unlikely event that there is an accidental release of ammonia from the facility.

Invenergy will put in place written procedures for the periodic inspection, testing, and maintenance of all equipment, controls, and sensors related to the storage and use of hydrogen at the facility. All staff involved with the storage, transfer and use of hydrogen will be provided with the appropriate training in procedures necessary to ensure the safe maintenance and operation of the hydrogen system, including emergency procedures. Periodic refresher training of this training will be provided to the relevant staff. Invenergy will coordinate with local emergency responders, including the nearest hazardous materials response team. Invenergy will provide them with all relevant information regarding the quantity of hydrogen stored on site and its location, transport routes and procedures.

Although not subject to the RMP requirements, Invenergy will conduct a facility-wide RMP-like hazard analysis to ensure full compliance with the General Duty Clause. This assessment will include the ammonia, hydrogen tubes, and fuel oil storage and delivery systems, the storage and transportation of hazardous waste generated at the facility, and the transport and use of natural gas at the facility or in the pipeline or related infrastructure.

Two one-million gallon tanks are proposed for the storage of fuel oil at the facility. The unit generators at the facility will use gaseous hydrogen for cooling and heat rejection. Truck trailer mounted hydrogen tube racks will be used for on-site hydrogen storage and makeup to the generators.

Review Team Comments and Recommendations

As presented, the proposed CREC facility is not subject to the RMP requirements and the proposed CREC facility is required to be in full compliance with the General Duty Clause. The proposed "facility-wide RMP-like hazard analysis" that is proposed to be conducted by the CREC design team is intended to provide a higher level of safety for the employees working at the proposed CREC facility as well as the residents in the vicinity of the proposed CREC facility.

A Risk Management Plan (RMP) should be a permit requirement and the ALOHA model inputs should be updated to satisfy RIDOH.

Since the development will have over 1,320 gallons of aboveground petroleum storage at the facility, a Spill Prevention Containment and Countermeasure (SPCC) Plan will be required in accordance with 40 CFR 112.

We appreciate the opportunity to assist the Town of Burrillville with these issues. If you have questions please contact me at your convenience

Very truly yours,

CDR MAGUIRE INC.

James A Jackson, P.E.
Project Manager