Petition before the Massachusetts Energy Facilities Siting Board for

Analysis in Support of Approval of Holyoke Gas & Electric's Liquefied Natural Gas Infrastructure & Resiliency Project

EFSB 22-07

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COMMONWEALTH OF MASSACHUSETTS

ENERGY FACILITIES SITING BOARD

HOLYOKE GAS & ELECTRIC DEPARTMENT

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5.1 Standard of Review

Section 69J requires the Siting Board to review alternatives to planned projects including "other site locations." In implementing this statutory mandate, the Siting Board requires a petitioner to demonstrate that it has considered a reasonable range of practical siting alternatives. To do so, an applicant must satisfy two conditions: (1) the applicant must first establish that it developed and applied a reasonable set of criteria for identifying and evaluating alternative sites in a manner that ensures that it has not overlooked or eliminated any sites that, on balance, are clearly superior to the proposed site; and (2) the applicant must establish that it identified at least two noticed sites or routes with some measure of geographic diversity. However, given that the designation of a noticed alternative site: (a) is not required by statute; (b) necessitates that a project proponent expend significant funds in both developing and supporting a noticed alternative site; and (c) has the potential to raise concern unnecessarily among potential abutters and others in the affected communities, the Siting Board has indicated that a noticed alternative site may not be warranted in all cases.

5.2 Site Selection Process

5.2.1 Overview of Site Identification and Analytical Processes

HG&E applied a comprehensive and rigorous process appropriate to the nature of the Project to identify potential site alternatives, to evaluate appropriate sites and then to select a preferred site or location for the addition of LNG storage capacity. The site evaluation process applied sophisticated engineering and environmental analyses and was confirmed by the consideration of the Siting Board regulation's performance standards applicable to new LNG facilities. Finally, the process considered the merits of only providing and posting notice of the preferred site or the West Holyoke Facility and to not include the consideration of other locations as "noticed alternative" sites.

The site selection process applied the following primary steps:

- Establish an appropriate study area for site identification and analysis;
- Develop and apply appropriate criteria for identifying and screening potential sites;
- Perform intensive analyses of the most attractive site alternatives;
- Identify the preferred site location based upon cost, reliability and environmental criteria;
- Confirm appropriateness of the most attractive site option by analyzing LNG performance standards applicable to new LNG equipment such as the proposed tank; and
- Evaluate the merits of presenting a "noticed alternative" site given the substantial benefits of the existing West Holyoke Facility site and the potential for unnecessary and significant community concerns associated with alternative sites.

5.2.2 Establishment of Study Area

HG&E recognized the need for additional LNG storage capacity to readily interconnect to its gas distribution system and, preferably, its high-pressure gas distribution system. HG&E also recognized a strong preference for sites in Holyoke rather than the portion of Southampton served by HG&E. The principal determining factors were HG&E's status as a municipal entity as well as operational considerations given the characteristics and principal location of the existing high-pressure gas distribution system and that the majority of HG&E's customers are located in Holyoke. HG&E considered the possibility of sites in Southampton but recognized that potentially suitable sites would face a number of challenges including the need for a lengthy, high pressure, gas distribution main (approximately 2.5 miles in length), zoning and municipal ownership concerns as well as a range of environmental constraints and operational issues including increased traffic. Accordingly, HG&E targeted its search in Holyoke but did extend its search radius to ensure that no clearly superior siting alternative was available in Southampton.

5.2.3 Site Identification and Preliminary Site Analysis

To identify potentially feasible or suitable sites for additional LNG storage, HG&E's first objective was to select appropriate screening criteria and then perform a preliminary analysis to identify the most suitable sites based upon the application of these criteria. The West Holyoke Facility was an obvious and initial site identified for this purpose, particularly in light of HG&E's originally authorized plan to construct five LNG tanks at that location. The West Holyoke Facility offered a range of siting opportunities and benefits that enhance reliability of operations, secure cost savings and reduce potential impacts to landowners and the environment. Nevertheless, HG&E conducted a thorough alternative site analysis to ensure that superior site alternatives for LNG storage operations were not overlooked.

HG&E's Project team developed the following criteria for the established study area within Holyoke:

- Minimum of 10 acres for the shop-fabricated tank project option to allow for adequate space for necessary equipment and relevant exclusion or buffer zones;
- Owned or controlled by Holyoke or knowledge that the parcels are available for acquisition at a reasonable cost;
- On or adjacent to an appropriate portion of the HG&E high-pressure gas distribution system;
- The nature of the area land use and the ongoing or planned activities of abutters as well as favoring sites where the relative distance of the likely location of equipment to abutters was greater, with the expectation that greater distances or screening opportunities would reduce impacts during construction and operation;
- Close proximity to and with readily available access to major roads and highways; and
- Locations that would likely be satisfactory to key stakeholders such as the Holyoke Fire Department and the local community.

As noted, the initial site identification process was applied to the entire municipality of Holyoke, with a substantial preference to sites already under municipal ownership. Given the likely and substantial cost associated with acquisition of a new property and the current benefits of the existing West Holyoke Facility, HG&E did not expect that the costs associated with the acquisition and development of a new parcel for the Project would be financially viable. The Project team, however, completed its due diligence on alternative sites by reviewing and evaluating municipal maps, consulting with other Holyoke municipal departments including the Holyoke Office of Planning and Economic Development and performing extensive site reconnaissance or inspection. The Project team was familiar with the Holyoke study area given its experience managing existing HG&E operations and the fact that most team members were long-time Holyoke residents.

HG&E determined that the West Holyoke Facility had sufficient space to add the proposed LNG storage tank and integrate it and the associated piping with the existing facility equipment. The West Holyoke Facility was also seen as an attractive location operationally due to the presence of existing LNG equipment as well as the location of the existing interconnection with the Northampton Lateral within the property. Additionally, the land use as an LNG storage facility is established and HG&E has existing positive relationships with the surrounding community. The location has appropriate vehicle access and is familiar to the Holyoke Fire Department and other first responders.

Based on the review criteria previously detailed, the Project team identified the following potential alternative sites for a new LNG storage facility to meet the identified need:

- Two parcels with a combined area of 10.98 acres off Whiting Farms Road in the southeastern portion of Holyoke that are currently owned by the Holyoke Economic Development and Industrial Corporation; and
- A 550-acre parcel off Apremont Highway in the southwestern portion of Holyoke just to the east of the West Holyoke Facility that is currently under control of the Holyoke Water Department.

The comparative site analysis was based upon the design requirements for each site. The West Holyoke Facility would involve essentially the addition of a single tank to a site with existing LNG infrastructure. The Whiting Road site would require the addition of all elements of a new LNG facility with only a single 70,000-gallon tank. The Apremont Highway site would support a large, field-erected tank and retirement of the LNG portion of the West Holyoke Facility.

A 49.55-acre parcel off County Road North in Southampton just north of the Holyoke city line that is currently in agricultural use and zoned as Residential Rural was identified as a potential alternative site for a field-erected LNG storage facility similar to the Apremont Highway site. The West Holyoke Facility LNG operation would be decommissioned if this site were able to be developed. This site was eliminated by HG&E as a viable alternative due to the following constraints:

- The parcel is not currently under the ownership of Holyoke;
- The site would require an approximately 2.5 mile long gas main extension to tie into the existing HG&E high-pressure gas distribution system and related operational challenges;

- Zoning exemptions or a special permit from Southampton would be required to build the new facility; and
- Lastly, the project would have a range of environmental impacts, including land use and traffic.

Whiting Farms Road Site

The Whiting Farms Road site consist of two parcels located between Whiting Farms Road to the east and Route I-91 to the west. In addition, there is a commercial development to the south and Environmental Justice residential areas to the immediate north of the site. This site is currently undeveloped and heavily wooded and expected to be employed for commercial use given its location between an industrial park and two-family residential district. With both parcels combined, this site would be sufficiently sized to comply with the requirements of all applicable LNG siting and operational codes and standards for a smaller shop-fabricated tank facility. The Whiting Farms Road site has some challenges, including substantial clearing, the lack of any existing services and the close proximity to residential and Environmental Justice populations.

Based on the undeveloped and forested nature of the property, there could likely be concerns related to federal and state-listed rare bat species as well as cultural resources. Consultation would need to be initiated with the U.S. Fish and Wildlife Service, Massachusetts Natural Heritage and Endangered Species Program and the Massachusetts Historical Commission. There would likely be time of year restrictions associated with tree clearing to protect the rare bat species (namely, no clearing April through August). These limitations would adversely affect the schedule for construction of the facility.

Apremont Highway Site

The Apremont Highway site is an approximately a 550-acre parcel located east of Apremont Highway and north of Route 202 (Westfield Road) with frontage on both roads, with most of the parcel being undeveloped and heavily forested. The Holyoke Water Department currently operates two water tanks and associated facilities on this parcel with access off Apremont Highway. The parcel is zoned Residential-Agricultural, but zoning in Holyoke allows for municipal utility use. An approximately 25 acre site would need to be subdivided from this parcel to build and operate an entirely new LNG storage facility. There would also be sufficient area to pursue a larger, field-erected LNG storage tank design at the location. This site is more than sufficiently sized to comply with the requirements of applicable LNG siting and operational codes and standards. The Apremont Highway site, though, presents a number of challenges, including the need for substantial grading and clearing, road construction and the complete lack of any existing services.

From an environmental perspective, the Apremont Highway site also involves a number of constraints. In addition to similar concerns regarding rare bats and cultural resources as the Whiting Farms Road site, the Apremont Highway site is also encumbered by significant areas of wetland as well as a perennial stream. These areas are protected and regulated by local, state and federal agencies and any activities within or adjacent to these resources would require permits and/or approvals under the Clean

Water Act and the Massachusetts Wetlands Protection Act. The property is also wholly-located within a Surface Water Protection Area associated with public water supply wells as well as Priority / Estimated Habitats of Rare Wildlife. The proposed development of the property for a new LNG facility would require extensive environmental surveys and associated permitting which would likely include mitigation for any Project-related impacts to sensitive environmental resources. Finally, the site is subject to Article 97 requirements affecting both access and cost.

5.2.4 Comprehensive Site Study and Comparison

Subsequent to the initial site evaluation process, HG&E conducted a more rigorous and refined analysis of the specific facilities that would be required at the West Holyoke Facility or the Whiting Farms Road site or the Apremont Highway site. The site evaluation process necessarily reflected the specific equipment requirements and potential limitations at each of these three sites. The primary objective was to identify the preferred location for adding LNG storage given the positive and negative features of each of the three sites. HG&E's Project team conducted a detailed analysis for each potential site alternative in terms of cost, reliability or operational flexibility and environmental impacts.

5.2.4.1 Cost/Economic Analysis

The Project team's cost analysis relied upon internal and external engineering experts familiar with the construction and operation of LNG facilities. HG&E also secured price quotes or estimates from vendors of the major equipment as part of this process. The construction and operating cost comparisons of the site alternatives are based primarily on items or attributes that are expected to be applicable to each site as the facility design is generally comparable between locations. Special "cost considerations" are included in these assessments, where appropriate, such as the expense of any unique design or construction requirement where alternative solutions may be required or other location-specific costs such as tree removal and extensive grading. Appropriate or required impact mitigation measures for each site such as fencing and screening were also estimated and reflected in the cost analysis. Comparative capital and operating cost information is presented in the format described in 980 CMR 10.00. See Figure 5-2 and Figure 5-3.

The proposed LNG tank addition at the existing West Holyoke Facility was, overwhelmingly, the least-cost site alternative in terms of construction and operation that would enable HG&E to meet the identified need. The existing West Holyoke Facility site cost benefits were based on HG&E land ownership, lack of site preparation requirements, limited civil and environmental mitigation requirements, lower incremental operating costs and existing operating infrastructure to support the natural gas distribution system. Both alternative sites are substantially more expensive due to required land acquisition, extensive site preparation, lack of existing infrastructure, the need for more extensive equipment and associated environmental impacts requiring mitigation.

In sum, the existing West Holyoke Facility site is substantially superior site in terms of construction and operating costs.

5.2.4.2 Reliability Analysis

HG&E analyzed the three primary sites in terms of reliability and operational flexibility. HG&E determined that the existing West Holyoke Facility has the most favorable reliability advantages in terms of the provision of service to the existing natural gas distribution system. Necessary operating equipment, facilities, utilities and safety systems are already in place and the operating staff is highly experienced with the operation of the existing facility. The current location, with direct access to the existing TGP meter station, provides an additional benefit in terms of the ability to enhance reliability and safety with simplified operations and response capabilities. The Whiting Farms Road and Apremont Highway sites both require longer gas distribution system connection extensions, as compared to the existing facility with a system connection already in service. The Whiting Farms Road site does, however, have slightly better access to highways facilitating truck deliveries. In sum, the Project team determined that the existing infrastructure associated with the West Holyoke Facility site is superior in terms of reliability and operational considerations, however, the alternative sites, if constructed, would facilitate that provision of reliable service.

5.2.4.3 Environmental Analysis

The Project team employed traditional siting models for the environmental analysis with inputs based upon extensive field and data base investigations. The first, refined model employed a detailed comparative analysis applying a comprehensive range of criteria with specific scores at each location. Engineering and environmental experts participated in this analysis along with additional subject matter experts as needed. Scores were largely developed and assigned based upon a consensus-based process involving the various experts on the Project team. See Figure 5-1.

The comprehensive comparative analysis of evaluation criteria applied 18 separate factors in a manner consistent with sound siting practices and established precedent (zoning was not considered a relevant comparable factor for any site, as HG&E is a municipal utility and municipal facilities are permitted within all zones according to the current municipal ordinance). See, Holyoke City Code of Ordinances, Appendix A, Section 4-3 (B.9). The results of this analysis clearly demonstrates that the existing West Holyoke Facility site is substantially superior to the two alternative sites with respect to potential environmental impacts, as the West Holyoke Facility site was assigned the highest possible score for 17 of the 18 factors. One of the critical factors supporting use of the existing West Holyoke Facility was the existing availability within the developed portion of the property that would limit the need for new land disturbance, site preparation and construction-related impacts. The existing West Holyoke Facility site also minimizes impacts to the surrounding community, as the Project is consistent with the current land use and does not affect any additional landowners. HG&E provides a comprehensive plan to mitigate any construction or operational impacts associated with the Project in Section 6.0.

The existing West Holyoke Facility Site does not contain any recognized environmental conditions or de minimis conditions. An indicative measure of the attractiveness of this site is that no filing requirement is “triggered” pursuant to the Commonwealth’s comprehensive review pursuant to the Massachusetts

Environmental Policy Act (MEPA) program or any other environmental permitting request. Additionally, the Project does not require any additional environmental permits or approvals with respect to natural or cultural resources, air emissions or noise. The Whiting Farms Road and Apremont Highway sites both involved a range of environmental impacts requiring permits or other regulatory approvals.

HG&E also applied a comparative model in the format described in 980 CMR Section 10.02 Figure 5-4 of the Siting Board's regulations. This model requires a summary presentation and analysis of a diverse set of environmental factors coupled with cost and reliability considerations. The application of this model in terms of environmental factors was also based upon a consensus approach by the Project team when possible. This comprehensive analysis demonstrated that the addition of a new LNG storage tank at the existing West Holyoke Facility is substantially superior in terms of minimizing environmental impact, but also that its limited impacts to the environment will be effectively mitigated by design and construction plans. The two alternative sites have extensive environmental impacts and would require additional environmental permits/clearances prior to the commencement of any construction activities.

In sum, siting of the Project at the existing West Holyoke Facility was the substantially superior site alternative with respect to minimization of environmental impacts.

5.2.4.4 Conclusion: Comparative Site Analysis

The existing West Holyoke Facility site is substantially superior to the two identified site alternatives in terms of cost and environmental impacts associated with construction and operation. The existing site is also superior in terms of reliability and operational flexibility. Accordingly, HG&E has determined that the existing West Holyoke Facility site should be evaluated as the preferred location in terms of the ability to meet applicable industry design standards while avoiding and minimizing potential Project-related impacts to the greatest extent practicable.

5.3 Preferred Alternative Site Selection – HG&E and Confirmation of Design Standards

A final and confirmatory evaluation and review of the conclusion of the siting selection analysis was a detailed FEED Study of the West Holyoke Facility location in terms of the ability to comply with regulations applicable to the planned addition of the LNG storage tank (see list below). The principal focus at this stage was to evaluate the requirements and any implications of relevant federal and state LNG siting regulations that are applicable to the Project, including a number extremely conservative requirements within the Siting Board's and federal regulations.

Relevant codes and standards applicable to the Project's design and operation include:

- 980 CMR 10: Massachusetts Siting of Intrastate Liquefied Natural Gas Storage
- 220 CMR 112: Massachusetts Design, Operation, Maintenance and Safety of LNG Plants
- 49 CFR Part 193: Liquefied Natural Gas Facilities: Federal Safety Standards

- NFPA 59A: Standard for Production, Storage and Handling of Liquefied Natural Gas (LNG) (Only applies to Sections of the 2001 and 2006 Editions incorporated by 49 CFR Part 193)

This stage of the site confirmation analysis process involved several distinct steps. First, the Project team recognized that certain sections of National Fire Protection Association (NFPA) 59A provide direction on criteria that should be considered as part of the site selection process in the LNG industry. These criteria were generally similar and confirmatory to factors considered earlier in the process but an express review provided appropriate validation of such efforts. Second, the Project team analyzed and applied the full range of applicable federal and state design and siting regulations, relevant mapping requirements, the definition of specified exclusion zones and, finally, certain other or ancillary requirements to the Project area to ensure compliance would be maintained with these parameters.

The consideration and analysis of these regulatory requirements further confirmed and validated the appropriateness of the merits of adding a LNG storage tank at the existing West Holyoke Facility site as opposed to constructing a new secondary LNG facility at an alternative location. HG&E evaluated and designed the Project at the West Holyoke Facility site to ensure that Siting Board substantive and evidentiary or presentational requirements in applicable regulations will be satisfied. The Siting Board regulations include several requirements that pertain to the design of the Project. The Siting Board's regulations also require the presentation or mapping of certain zones around a proposed project in the course of the approval process, presumably to facilitate siting review. Finally, there are specific procedures for defining areas subject to property control requirements. Appendix I describes compliance with all Siting Board requirements, while the following section provides a detailed recitation of required control areas around the Project. The Project team determined that all relevant standards could be satisfied or exceeded, which confirmed the appropriateness of the addition of a new LNG storage tank at the West Holyoke Facility.

5.3.1 Siting Board Performance Standards with Respect to Site Conditions

Section 10.03 of the Siting Board regulations includes two primary and specific "Performance Standards for Determining Site Sizes." These regulations define areas for a Thermal Radiation Protection Zone as well as a Vapor Dispersion Exclusion Zone. The Thermal Radiation Protection Zone is defined as an area which the Applicant owns or controls surrounding the Facility that is of sufficient size such that the thermal flux levels resulting from an extraordinary fire after a spill, as measured at the outer boundary, cannot exceed the levels specified in the regulations. In addition, any LNG storage tank "dike" cannot be located closer to specified receptors (which distances vary based upon whether the site is within an area zoned for industrial or residential use).

HG&E will employ a new, remote impoundment basin north of the new LNG storage tank where the recessed impoundment will act as the required "dike" structure in accordance with Section 10.04(1) of the Siting Board regulations. The calculation of the thermal radiation protection zones for this alternative was based on this "dike" design as the compliance structure for the Project.

In accordance with 980 CMR 10.03(2), HG&E must also demonstrate that a sufficient area has been provided for vapor dispersion protection to prevent vapor from an extraordinary design spill from crossing the property line of the West Holyoke Facility. The design spill for the newly installed equipment will be collected by a strategically graded system to the new impoundment basin "dike" north of the new LNG storage tank. With the use of a standard vapor fence surrounding the existing West Holyoke Facility, the vapor dispersion exclusion zone will be wholly contained within the property line of the West Holyoke Facility for this preferred alternative.

In sum, the Project design fully meets the performance standards and requirements within the Siting Board's regulations for the thermal protective zone and the vapor dispersion exclusion zone.

5.3.2 Analysis of Additional Site Design Requirements

In addition to applying the siting criteria requirements of the Siting Board regulations, HG&E evaluated and ensured compliance with other applicable regulatory or siting requirements at the West Holyoke Facility site. Specifically, HG&E has also applied and ensured compliance with the relevant siting criteria under federal regulations pursuant to 49 CFR Part 193 and NFPA 59A as a final confirmation in the siting process. Chapter 2 of the 2001 Edition of NFPA 59A relates to facility siting and layout and is specifically incorporated by citation in 49 CFR Part 193. The NFPA, based upon the long industry history of safe operations, has established criteria for consideration in the siting of LNG facilities. The NFPA standards propose that four key factors or categories be considered when siting an LNG facility, many of which overlap with the factors that HG&E applied earlier in the site selection process. These design criteria are as follows:

1) Provision for Minimum Clearances with Respect to Plant Property Lines and Between Equipment.

These requirements were comprehensively satisfied in the Project design and site selection led by the Project team. As described below, all relevant planning or safety "limits" defined under federal or Massachusetts regulations are contained or included entirely within the West Holyoke Facility's boundaries including the limits defined in the Siting Board's regulations. Relevant equipment separation guidelines (similar to 980 CMR 10.04(2)) were fully incorporated into the design and configuration of the proposed LNG storage tank, including the tank's location with respect to existing equipment.

2) All-weather Accessibility or On-site Provisions for Personnel Safety and Fire Protection.

Pursuant to 49 CFR Part 193, each operator of an LNG facility must provide and maintain fire protection at LNG facilities according to sections 9.1 through 9.7 and section 9.9 of NFPA 59A-2001. Consistent with standard practice, a detailed evaluation and review of fire protection design and alternatives for the Project was completed, which is also a requirement of 220 CMR 112.40. The proposed design includes, among other features, the addition and expansion of existing automated shut-down systems, sophisticated leak and fire detection systems as well as strategically located on-site emergency equipment. These features will complement the existing and substantial safety features of the West

Holyoke Facility. HG&E prepared a comprehensive Fire Study and Prevention Plan which was reviewed with the Holyoke Fire Department and is provided in Appendix C.

3) Within Limits of Practicality, a Plant Shall be Designed in Consideration of Relevant Forces of Nature.

As an initial matter, consistent with good engineering practices, the Project will be designed to meet or exceed applicable "loading" requirements set forth in the Massachusetts Building Code. The Project will also meet the more stringent wind loading requirements set forth in 49 CFR Part 193. The Project team completed a detailed analysis of particular or more severe weather patterns or other natural conditions that theoretically could affect design or operation. The Project team determined that Holyoke does not experience severe weather patterns or other "natural" risks that might require specific enhanced design enhancements.

Average annual weather data specific to Holyoke, Massachusetts derived from USA.com (http://www.usa.com/01040-ma-weather.htm)[1] are listed in Table 5-1 below:

Table 5-1: Holyoke, Massachusetts Weather Information

Annual Average	**Holyoke Annual Average**	**United States Annual Average**
Annual Average Precipitation	49.9 inches	38.7 inches
Annual Average Snowfall	68.1 inches	23.3 inches
Annual Average Humidity	76.7 %	77.5 %
Annual Average Windspeed	18.6 mph	16.9 mph

This table above demonstrates that Holyoke's weather is generally consistent with national averages and, as a result, HG&E has satisfied the requirement that severe weather be appropriately considered in the comprehensive design with respect to weather-related factors.

Regardless, the Project will be designed to safely withstand severe weather conditions typically experienced in Massachusetts including those experienced over a 100-year period with respect to stormwater management, flooding and snow removal. The Project will feature a stormwater management system designed to meet the current MassDEP Stormwater Management Standards, which includes analysis and design measures for a 100-year storm event with post-construction runoff rate and volumes lower than pre-construction levels.

In addition, the Project is not subject to other natural hazards more common in other regions, as described below:

Earthquake Index: There have been no recorded historical earthquake events with a magnitude of 3.5 or higher experienced in or near Holyoke, Massachusetts. The earthquake index

[1] Source: http://www.usa.com/01040-ma-weather.htm

established for this area is 0.19 compared to the United States average earthquake index of 1.81. The index values are calculated based on data provided by USA.com.

Volcano Index: No known volcanos have been identified in Holyoke, Massachusetts and the index value is 0.0000 compared to the United States average volcano index of 0.0023 (USA.com).

Tornado Index: There have been 52 historical tornado events that had a recorded magnitude of 2 or above found in or near the Holyoke, Massachusetts area over the most recent approximately 70 years. According to USA.com, the tornado index is 138.37, which is close to the United States average tornado index of 136.45.

In sum, HG&E comprehensively considered and accounted for weather and other potential natural hazards in the site evaluation and project design processes.

4) Other Factors Applicable to Site Operations or Surrounding Areas and the Consideration of Appropriate Safety Measures.

Adjacent Activities: HG&E recognized that this criterion is akin to the consideration of surrounding land use, which was considered extensively in earlier phases of the site selection process. The West Holyoke Facility is an active municipal LNG facility that has been in operation since 1971. The site is located adjacent to established energy generation and residential land uses and is located within an area zoned for residential and municipal facility use. The Barnes National Air National Guard Base is located approximately 10,450 feet (1.98 miles) to the southwest of the existing site, well outside the limitations within 49 CFR Part 193 that precludes the construction of an LNG storage tank within a horizontal distance of one mile from the ends or one-quarter mile from the nearest point of a runway, whichever is greater. The existing West Holyoke Facility site is in full compliance with requirements regarding adjacent activity.

Security: This NFPA criterion requires that appropriate security be considered in site selection and, more importantly, design. 49 CFR Part 193 also prescribes the requirements for security at LNG facilities. The existing West Holyoke Facility features security gates, fencing and a state-of-the-art surveillance system and access is controlled to prevent entry by unauthorized people all of which meet or exceed the design and procedural requirements of 49 CFR Part 193 and NFPA 59A.

Safety: The West Holyoke Facility has operated safely for many years and its design and operation meets or exceeds all regulatory requirements. The addition of the proposed LNG tank and integration with existing systems would also be completed to meet or exceed all requirements. HG&E used the FEED Study for the proposed addition of storage capacity to review all current systems that are in full compliance with relevant codes and regulations. HG&E identified enhancements to its control gas system and an upgrade to its fire alarm control panel that would provide additional benefits. While not required, these enhancements provide

additional environmental and safety benefits to the West Holyoke Facility and the surrounding community and will be completed in coordination with the Project.

5.3.3 Satisfaction of Performance Standards

HG&E determined that the planned addition of a new LNG storage tank at the existing West Holyoke Facility will satisfy all applicable performance standards for new LNG equipment.

5.4 No Additional Sites Should be Reflected in Public Comment Notice

HG&E respectfully submits that any notice issued in this proceeding not include a requirement to provide notice of an alternative site or sites. This conclusion is largely dictated by the substantial superiority of the Project Site over any potential alternative site as described herein. The development of notice beyond the Project Site is not warranted because it could require the expenditure of significant funds to complete the steps associated with providing notice and the service of notice for sites not likely to be constructed would likely cause unnecessary concern to potential abutters and stakeholders adjacent to any such alternative site. At least one potential site is in a more densely populated area of Holyoke within Environmental Justice populations. The number of residents that might be concerned with respect to a potential project in their neighborhood that is extremely unlikely to be pursued suggests that including these sites in any notice is not in the public interest.

5.5 Conclusion: Site Selection Process

HG&E determined, based upon the application of sophisticated analytical techniques applying appropriate and reasonable criteria for identifying and evaluating sites, that the development of the Project at the existing West Holyoke Facility is, by far, the most favorable location with respect to minimization of environmental and landowner impacts as well as the least-cost site alternative, while also being superior to the alternative sites in terms of reliability of operations. The Project not only addresses reliability needs for existing customers but also delivers a solution that will contribute to the effective and strategic implementation of HG&E's plans and efforts toward a net zero future. HG&E's efforts to identify and evaluate alternative locations ensured that no clearly superior site has been omitted from consideration. Finally, the results of these analyses suggest that the inclusion of a "noticed" alternative site in this proceeding would be counterproductive and unnecessary.

Evaluation Criteria: | ● Highly Suitable | ◑ Suitable | ◔ Marginally Suitable | O Not-Suitable

Primary Criteria	Description	Site 1 West Holyoke LNG Facility Holyoke, MA 01040	Site 2 Whiting Farms Road Holyoke, MA 01040	Site 3 Apremont Highway Holyoke, MA 01040
Flood Plain (100 year)	Impact of 100-year flood plain with respect to site.	●	●	●
Flood Plain (500 year)	Impact of 500-year flood plain with respect to site.	●	●	●
Existing Site Use & Adjacent Activities	Proposed land use and traffic impacts to the surrounding area and abutters; Adherence to current zoning classification and land use.	●	●	●
Driveway Access Road Constructability	Location, length and grade of the access road.	●	◑	◑
Wetlands	Impact on wetlands, erosion and potential erosion post construction.	●	●	◔
Subsurface Conditions	Site development impacted by ledge and special excavation techniques.	●	◑	◔
Maximum Commercial Lot Size	Number of parcels and landowners required to obtain the site and current zoning ability to permit such a project.	●	◑	◑
Archaeological Considerations	Presence of known archaeological considerations and/or need for additional archaeological studies.	●	◑	◑
Site Grading	Impact on costs and schedule due to significant site grading considering soil type, depth to bedrock, soil permeability, seismic design criteria.	●	◔	◔
Highway Access / Traffic	Location related to major roads and highways, impact on local traffic patterns.	◑	●	◑
Utilities	Access to facility required utilities.	●	◑	◑
Vegetation	Heavy vegetation impacts clearing efforts and increases requirements to protect certain species.	●	◔	O
Visibility	Impact on public during construction period and post construction.	●	◑	◑
Environmental Justice	Impact on designated environmental justice population.	●	◔	●
Commercial Terms	Availability of land for purchase.	●	●	◔
Environmental Impact	Overall ability to permit the site based on environmental considerations.	●	◑	◔
Socioeconomics	Projection of land use, employment opportunities, air quality and recreational opportunities both with and without the proposed project.	●	◑	◑
Overall Suitability	Summary of the total suitability based on the above criteria.	●	◑	◔

Capital Cost Factors Matrix

Factors		West Holyoke Facility Site		Whiting Farms Road Site		Apremont Highway Site
Land Acquisition	$	*500,000*	$	*3,527,000*	$	*7,149,500*
Site Preparation	$	*299,000*	$	*800,000*	$	*1,400,000*
Structures & Improvements	$	*424,000*	$	*4,431,000*	$	*5,400,000*
LNG Process Equipment	$	*5,548,000*	$	*7,980,000*	$	*52,200,000*
LNG Transportation Facilities	$	-	$	*800,000*	$	*1,000,000*
Other Equipment	$	*1,023,000*	$	*2,970,000*	$	*3,000,000*
TOTAL	$	7,794,000	$	20,508,000	$	70,149,500

Notes:

1 All cost estimates are stated in current dollars.

2 Land Acquisition includes the cost to acquire land, land rights, permits, approvals and associated legal fees. These estimates are based upon $/acre costs for a comparably sized site developed in 2015 and include a 10% contingency on land acquisition. The West Holyoke Facility Site land is already owned by HG&E. The Whiting Farms Road site is 10.98 acres and the Apremont Highway site represents 25 acres. Permitting reflects costs associated with EFSB, legal and environmental processes.

3 Site Preparation includes the cost for all site preparation-related work (such as the extension of utility services to the Facility) and the construction of foundations for structures and equipment for each site. The Whiting Farms site and Apremont Highway site each require deforestation for clearing and blasting due to ledge. These estimates are based upon engineer's estimates from previous, similar work.

4 Structures and Improvements includes the cost to erect the proposed on-site buildings (heater and control room buildings), containment structures, fencing and roadways. These estimates are based upon engineer's estimates from previous, similar work. If the Whiting Farms Site were selected, "dike" work would still be performed at the West Holyoke Facility Site and is included in the estimate.

5 LNG Process Equipment includes the cost for the installation of: the full-containment LNG storage tank for the Apremont Highway site; truck unloading equipment; vaporization equipment; and all associated balance of plant equipment and systems. Startup and commissioning services are also reflected in these estimates. The major equipment/system cost estimates are based upon budgetary quotes received from manufacturers. The balance of plant equipment and systems and associated installation cost estimates are based upon engineer's estimates. The Whiting Farms Road Site consists of a single horizontal storage tank and associated process equipment. The Apremont Highway Site consists of a field-erected tank and associated process equipment. If the Whiting Farms Site were selected, heater replacement work would still be performed at the West Holyoke Facility Site and is included in the estimate.

6 LNG Transportation Facilities includes the cost to install the interconnection pipeline to and the access driveway at each site. These cost estimates are based upon budgetary quotes from qualified contractors and engineer's estimates from previous, similar work. The Whiting Farms Road Site and the Apremont Highway Site are both undeveloped properties will require extensive work to facilitate access and a distribution pipeline interconnection.

7 Other Equipment includes the cost of measuring and regulating equipment, gate station equipment, communication equipment and equipment not assignable to any of the forgoing factors. These estimates are based upon budgetary quotes from qualified contractors and engineer's estimates from previous, similar work. If the Whiting Farms Site were selected, emergency generator work would still be performed at the West Holyoke Facility Site and is included in the estimate.

8 The West Holyoke Site represents an AACE Class III High/Low range estimate and it +30%/-20% respectively. The alternative Sites represent an AACE Class V estimate and is within the high range of +100% to +30% and within a low range of -50% to -20%.

9 Engineering is assumed 9% of the item cost and Construction Management assumed 5% of the item cost.

Annual Cost Factors Matrix

Factors		**West Holyoke Facility Site**		**Whiting Farms Road Site**		**Apremont Highway Site**
Operating Expenses	*$*	*-*	*$*	*388,000*	*$*	*410,448*
Maintenance Expenses	*$*	*40,000*	*$*	*331,550*	*$*	*373,550*
TOTAL	$	40,000	$	719,550	$	783,998

Notes:

1 All cost estimates are stated in current dollars.

2 Operating expenses represent incremental costs based on existing operations. There are no new operating expenses associated with the West Holyoke Facility Site. The operating expenses for the Whiting Farms Road Site is based two LNG sites operating (existing site and new) and Apremont Highway Site is based on additional expenses associated with a new, larger LNG facility replacing the existing site.

3 Maintenance Expenses include: spare parts; contracted costs associated with planned and unplanned major maintenance of equipment; site upkeep (mowing, snow removal, etc.); These estimates are based upon engineer's estimates from previous, similar work. No additional maintenance expenses for the West Holyoke Facility Site beyond new equipment spare parts.

Factors	West Holyoke LNG Facility Site	Whiting Farms Road Site	Apremont Highway Site
Ease of Acquisition	3	2	1
Climatology	2	2	2
Geology	3	2	1
Hydrology	3	3	1
Transportation Access	2	3	2
Ecological Sensitivity	3	2	1
Socioeconomics	3	1	2
Special Resource Commitment	3	2	1
Other	2	2	3
TOTAL	**24**	**19**	**14**

Factors	West Holyoke LNG Facility Site	Whiting Farms Road Site	Apremont Highway Site
Ease of Acquisition	3 The site is already owned by the Applicant.	2 The site is available for purchase as two separate lots.	1 The site is not currently available for purchases and is owned by the city water department. The property is designated as protected open space and is subject to the provisions of Article 97 which requires legislative approval for transfer of the land / alternative use.
Climatology	2 The climate for all sites is essentially the same.	2 The climate for all sites is essentially the same.	2 The climate for all sites is essentially the same.
Geology	3 The soil type at the site is sandy and the site already graded for development.	2 Soil type is a silt loam but is very stony. No bedrock would likely be encountered. Site would need to be cleared of vegetation leading to potential soil erosion.	1 Soil type is extremely stony. Bedrock anticipated, likely requiring blasting. Site would need to be cleared of vegetation leading to potential soil erosion.
Hydrology	3 There are no wetlands in the project area and the site is outside the 100- and 500-year flood plain. The site is not located within a Zone 1 or Zone 2 Surface Water Protection Area.	3 There are no wetlands in the project area and the site is outside the 100- and 500-year flood plain. The site is not located within a Zone 1 or Zone 2 Surface Water Protection Area.	1 The site would impact a wetland system and is likely located within the 200-foot Riverfront Area associated with a perennial stream. The site is located outside the 100- and 500-year flood plain. The site is located within both Zone 1 and Zone 2 Surface Water Protection Areas.
Transportation Access	2 The site is located near major highway access points but is off of major roadways.	3 The site is located in close proximity to Interstate 91 and Interstate 90 highway access points.	2 The site is located near major highway access points but is off of major roadways.

Ecological Sensitivity	3 There are no identified sensitivities with this project site.	2 The site would require substantial tree clearing and grading to facilitate installation. The site is not located within an area of estimated / priority habitat of rare species as mapped by MA NHESP. There are no potential or certified vernal pools within the property. Tree clearing associated with site preparation would likely be subject to time of year restrictions to avoid potential impacts to federally listed rare bat species.	1 The site is designated a NHESP priority habitat of rare species. The site would also require substantial tree clearing to facilitate the project design installation. Tree clearing associated with site preparation would likely be subject to time of year restrictions to avoid potential impacts to federally listed rare bat species. There are both certified and potential vernal pools within close proximity to the site. Development of the site would require extensive consultation with the MA Natural Heritage and Endangered Species Program to ensure that impacts to rare species are avoided, minimized and mitigated to the extent practicable.
Socioeconomics	3 The facility is already in operation and within a zone designated for municipal use. There are no EJ neighborhoods within 1-mile of the site.	1 The facility is located within an EJ neighborhood which would trigger the MEPA review process and require significant analysis of potential project-related impacts on the community.	2 There are no EJ neighborhoods within 1-mile of the site. Site would result in substantial change to land use.
Special Resource Commitment	3 This site has no known special resources such as proximity to sensitive receptors, archaeological site or historic locations. Development of the site will not require any environmental permits / approvals.	2 This site has no known special resources such as proximity to sensitive receptors, archaeological site or historic locations. However, the site is currently undeveloped and would likely require screening from MA Historical Commission to ensure the absence of cultural resources. Development of the site will require consultation with MHC and USFWS regarding potential project-related impacts to rare species and cultural resources. Project will require MEPA review based on proximity to EJ community.	1 This site has no known special resources such as proximity to sensitive receptors, archaeological site or historic locations. However, the site is currently undeveloped and would likely require screening from MA Historical Commission to ensure the absence of cultural resources. Development of the site would require multiple environmental permits or resources from federal, state and local regulatory agencies potentially including Holyoke Conservation Commission, MassDEP, NHESP, U.S. Army Corps of Engineers and MA Environmental Policy Act Unit.
Other	2 This site has established buffer and screening to existing residences.	2 This site has some buffer to existing residences and commercial/industrial properties.	3 This site has the largest buffer potential to existing residences.