



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



DECEMBER 7, 2022

Submitted by:
Holyoke Gas & Electric
99 Suffolk Street
Holyoke, MA 01040

In Association with:
AWCO Engineering & Technical Services, LLC
Sanborn Head & Associates, Inc.
Epsilon Associates, Inc.
Pierce Atwood LLP

COMMONWEALTH OF MASSACHUSETTS

ENERGY FACILITIES SITING BOARD

HOLYOKE GAS & ELECTRIC DEPARTMENT

EFSB 22-07

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2.0 PROJECT OVERVIEW

2.1 Project Description

The proposed Project consists of the installation of a new 70,000-gallon horizontal, shop-fabricated LNG storage tank. The proposed LNG storage tank will be installed adjacent to the existing array of four 55,000-gallon LNG storage tanks and within the general vicinity of the location of a previously proposed and approved, but never constructed, fifth LNG storage tank. The new LNG storage tank will be installed within the footprint and perimeter fence line of the existing West Holyoke Facility. A preliminary site layout for the Project and other planned, complementary improvements consisting primarily of the replacement of the existing vaporizer system with a new, redundant system (and related heating equipment) is included as Figure 2-1.

In connection with the proposed Project, limited new associated work is required as follows:

- Civil/Structural
 - A new impoundment “dike” for the proposed LNG storage tank consistent with the requirements of 980 CMR 10.00
 - New foundations for the proposed tank
 - Limited site civil grading and drainage
 - Stormwater runoff management system for the new impervious surfaces including the new impoundment “dike”
- Mechanical
 - New LNG and LNG vapor process piping, manual valves, shutoff valves and associated equipment required to tie in the new LNG storage tank to the existing LNG storage tank piping systems
 - New impoundment sump pump system for the removal of precipitation from the proposed dike
- Instrumentation and Controls
 - Integration of new instrumentation and control devices associated with the new tank to existing systems
- Hazard Mitigation
 - Integration of new fire and combustible gas detection equipment associated with the new tank to existing systems

The planned, complementary improvements include: (i) safety enhancements consisting of the installation of a new fire alarm control panel and improvements to the facility’s process and safety control system; (ii) an enhanced instrument air compression system that will replace the existing natural (power) gas system used to operate process control valves and further reduce GHG emissions at the West Holyoke Facility; and (iii) an upgraded standby electric generator will be installed to provide for further reliability of service at the facility.

In addition, Appendix B provides a further technical description of both the Project and planned, complementary improvements at the West Holyoke Facility.

2.2 Project Equipment

2.2.1 New Storage Tank

The proposed LNG storage tank employs well-accepted, proven and economical technologies that are also consistent with the operations and maintenance of the existing equipment at the West Holyoke Facility by HG&E staff. The decision to employ the horizontal, shop-fabricated LNG storage tank was based in large part upon its similar design to the existing LNG storage tanks which will provide for the continued ease of operation and maintenance of all equipment on a coordinated basis. The only other LNG storage alternative is a vertical, field-erected LNG storage tank which is not economical at the volume proposed for the Project (70,000-gallons). The construction of a vertical, field-erected tank would also have negative visual impacts due to it being taller and would lengthen the construction schedule of the Project. Since the shop-fabricated tank will be manufactured off-site, the on-site construction activities for the Project can be compressed since field construction work can be performed in parallel to the fabrication of the tank, thereby reducing impacts to neighbors.

2.2.2 Operational Systems

The West Holyoke Facility is equipped with multiple systems to support the operation of the current LNG storage equipment. Any necessary interconnection to existing equipment or systems associated with the Project will also be completed in conjunction with the installation of the new LNG storage tank.

The new LNG storage tank and integration equipment will be designed with safety features such as isolation valves, double block and bleed valving, overpressure protection and gas and flame detectors that will meet or exceed all regulatory requirements. The new components will be operated by the existing and qualified staff adhering to the procedures set forth in the operations and maintenance procedures for the West Holyoke Facility, which will be updated to reflect new equipment.

2.2.2.1 LNG Tanker Truck Unloading

LNG inventory is maintained at the West Holyoke Facility pursuant to LNG tanker truck deliveries throughout the year, with higher frequency of deliveries to maintain inventory during the peak season. Currently LNG trucks drive into the secure West Holyoke Facility's unloading station where flexible hoses are connected to the truck and an unloading pump distributes LNG to the LNG tank array. Beyond the installation of limited piping to extend the existing LNG fill piping to the new LNG storage tank, no other changes to the LNG tanker truck unloading system are proposed or required.

2.2.2.2 LNG Boiloff Gas System

The existing boiloff gas handling system manages passively vaporized LNG due to heat transfer into the LNG storage tanks. When the West Holyoke Facility is idle, the tank pressure is maintained with automatic controls on the boiloff gas system. When pressure in a tank reaches a setpoint, the boiloff gas is released into the boiloff gas piping, is warmed in an ambient heat exchanger (HE-300), odorized and sent into the HG&E distribution system. Beyond the extension of the existing boiloff gas piping to the new LNG storage tank, no other changes to the are proposed or required.

2.2.2.3 Pressure Build System

As LNG is discharged from the storage tanks during vaporization, the “pressure build” system is employed to maintain pressure to move LNG from the storage tanks by replacing the volume of LNG utilized for send-out with an equal volume of LNG vapor. The pressure build system consists of standard fan-assisted ambient heat exchangers and LNG flow control valves. A new, enhanced ambient natural convection pressure build coil will be added alongside the proposed LNG storage tank as part of the Project. This is the only change to the system proposed in connection with the Project.

2.2.2.4 Send-Out, Metering, Odorization and Heating Value Adjustment Systems

The boiloff gas and vaporized LNG are metered separately, then combined from each tank into the same line in the West Holyoke Facility yard near the water-glycol heater and pumps area. This single stream is routed to the odorization room where the gas is odorized and where the heating value may be stabilized by the injection of compressed air, if required, to maintain a consistent energy value of the vaporized LNG. No changes to the send-out metering, odorization or energy value adjustment systems will be made or required other than the interconnection of the new LNG storage tank.

2.2.2.5 Safety Systems

The West Holyoke Facility includes multiple safety systems designed to detect hazardous conditions and mitigate their potential consequences. Fire/flame detection, combustible gas detection, fire suppression, back-up power, security and communications systems are currently in place at the West Holyoke Facility. Changes to safety systems associated with the Project are primarily to integrate the new LNG storage tank. Project-related changes along with the complementary safety system enhancements will meet applicable state and federal requirements and are described in the Fire Study. See Appendix C.

2.2.2.6 Coordinated Work for Efficiency or to Reduce Impacts

HG&E conducted a thorough evaluation of the West Holyoke Facility as part of its design. HG&E identified opportunities to enhance and further improve the reliability and safety of the operations at the West Holyoke Facility by being opportunistic and taking advantage of the contractors that will be on-

site for the installation of the proposed tank. For example, civil contractors needed to construct the berm for the proposed tank may also be able to efficiently perform restoration of the existing berms. One berm wall of an existing containment system will be employed as part of the impoundment “dike” for the new LNG storage tank reducing overall impacts as well as securing cost savings. HG&E also plans to perform limited equipment replacement on a coordinated basis to secure an additional reliability enhancement. Specifically, HG&E plans to replace an older vaporizer system with a new redundant system (and related heating equipment). This replacement will enhance the reliability of service in the event of an equipment failure at the current, single vaporizer.

2.3 Equipment Siting Approach

2.3.1 Background

The original West Holyoke Facility was constructed in 1971 and included two LNG storage tanks (referred to by HG&E as tanks T-100 and T-101), each with a capacity of 55,000 gallons. In 1974, two additional tanks were installed and commissioned into service (referred to as tanks T-102 and T-103), each of which also had a capacity of 55,000 gallons. The original West Holyoke Facility design was intended for a total of five LNG storage tanks. Foundations and spill impoundment capacity for a fifth tank were constructed, but the fifth tank was never installed due to changing operational needs and financial considerations. In 1985, the West Holyoke Facility’s impoundment system was enhanced in response to the recommendations of a Fire Study prepared by Litzinger and Co. Engineers primarily to better capture an LNG “design spill” from a leak in the LNG piping adjacent to the tanks. HG&E installed a “sub-impoundment” pit and “broke” the berm wall that previously separated the two tank spill impoundments. A trench to direct LNG spills to the new sub-impoundment located approximately 50-feet north of the tank impoundment area was also added. This work made the two previously separate tank impoundment areas common. See Figure 2-2.

2.3.2 Proposed Impoundment Approach

2.3.2.1 Spill Impoundment

The proposed LNG storage tank (to be referred to by HG&E as T-104) will have its own spill impoundment “dike” that will be independent of the existing LNG storage tank spill impoundment facilities and that will conform with 980 CMR 10.00 which requires an LNG storage tank to have an independent spill impoundment “dike” sized for 150% of the storage tank volume. T-104 will be installed to the north of T-103. The refurbished north berm wall of the T-103 impoundment will also serve the dual and complementary function as the south wall of the T-104 impoundment. Berm walls will be constructed around the west, north and east of T-104. The height of the berm will ensure that a tank spill from T-104 is conveyed to a new remote impoundment, located to the north of T-104 and directly east of the existing remote sub-impoundment. The new impoundment will be sized for 105,000 gallons (150% of total LNG storage volume), in accordance with 980 CMR 10.0. The proposed dimensions of the impoundment facility are 38’L x 38’W x 11’D.

As noted, as part of the Front-End Engineering and Design (FEED) Study performed for the Project, a topographic survey of the existing West Holyoke Facility site was performed. This survey determined that the total volume of the existing LNG spill impoundment “dike” continues to exceed the volume requirement of the West Holyoke Facility’s design criteria (324,700-gallons versus 220,000-gallons). The survey also determined that some of the original walls of the impoundment “dike” have been worn down over time by weather and other causes. HG&E concluded that existing berm walls needed some limited refurbishment. The availability of a range of on-site contractors performing Project-related tasks, including civil work, presented cost and impact reduction opportunities. As such, HG&E proposes to perform limited modifications to the existing LNG storage tank impoundment “dike” system to restore the impoundment system back to its initial design by using contractors that will be on-site during Project construction.

2.4 Construction Schedule and Cost

HG&E is pursuing all necessary and required actions to have the Project in-service prior to the 2025/2026 winter heating season. HG&E contracted with consultants to perform the FEED Study and environmental review for the Project and complementary improvements to support the preparation of this Petition and identify ways to expedite the next phases of the Project, namely the final engineering and design, procurement of major and long lead equipment and construction. The overall time needed to complete the Project is currently estimated at approximately 21 months after the issuance of HG&E’s Final Order by the Siting Board. The actual completion date may vary dependent on the timing of the review by the Siting Board. The equipment procurement schedule is driven by long lead-time items, as over 17 months is needed for the fabrication and delivery of the LNG storage tank. Field construction, commissioning and training will require up to 8 months to complete. See Appendix D.

The total cost for the Project and complementary improvements at the West Holyoke Facility is estimated at about \$7.8 million in 2022 dollars based on an Association for the Advancement of Cost Engineers Class III (+30%/-20% accuracy) cost estimate that was performed as part of the FEED Study. This cost estimate equates to \$4.4 million for the Project and \$3.4 million for the complementary improvements. As HG&E is a municipal utility that sets its own utility rates, HG&E will pursue all opportunities to control costs of the Project and complementary improvements. An expedient review of the Petition by the Siting Board and the early execution of the work will facilitate the more economic provision of incremental and beneficial services to customers, particularly as the Siting Board review is the only permit needed for the Project and no permits are required for the complementary work.

2.5 Safety Planning

HG&E will ensure that the selected contractor develops and implements a comprehensive construction safety plan. See Appendix E. HG&E will enhance its existing West Holyoke Facility Safety Plan to incorporate the additional tank. These plans will be designed to continue to meet or exceed all industry and regulatory standards. Importantly, design and planning will be enhanced by third-party review, including review from public fire and safety officials as well as property owners adjacent to the West

Holyoke Facility as required by 980 CMR 10.04(5). HG&E will also perform annual safety consultations with these adjacent property owners. The West Holyoke Facility's current O&M Plan, including Emergency Procedures, is provided. See Appendix F.

2.6 Site Security

The Project will be located wholly within the existing fence line of the West Holyoke Facility and will not require any modifications to the existing security system. The existing security system meets or exceeds all applicable federal and state regulations. See Appendix F.

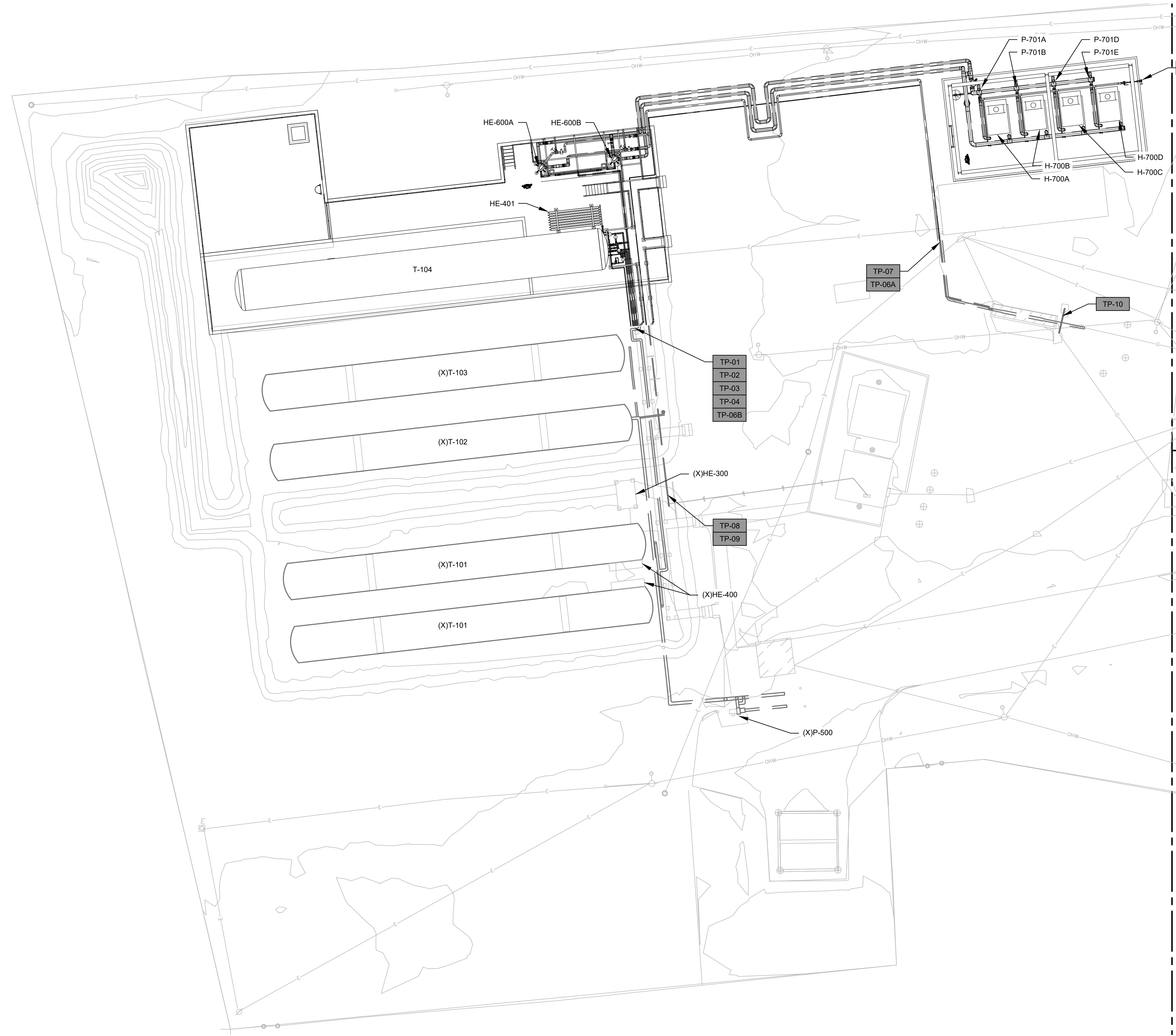
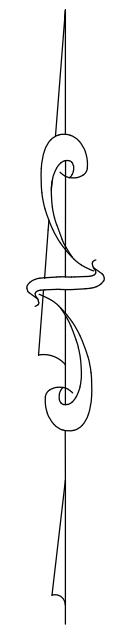
The West Holyoke Facility will continue to be surrounded by a "protective enclosure" (security fence) with access off Mueller Road for emergency egress as well as normal operations for LNG trucks, personnel vehicles, construction and maintenance vehicles. Additionally, the security fence is monitored for the presence of unauthorized access through security cameras as well as appropriate motion or similar sensors. HG&E will be able to continue to monitor and record events or activities in "real time." Furthermore, the operators will continue to communicate with the local law enforcement agencies as well as enable direct communication between all on-duty personnel having security responsibilities. The security system alarms and video will continue to be monitored remotely at the HG&E's dispatch center, which has 24/7/365 coverage, when the West Holyoke Facility is not occupied or as a back-up to the operators when the West Holyoke Facility is occupied.

2.7 Staffing

The West Holyoke Facility will continue to be operated and maintained at the same staffing levels that are currently employed. The West Holyoke Facility will continue to be staffed during the summer months for LNG truck offloading operations and preventative maintenance activities and, in the winter, for LNG vaporization operations. During truck offloading and vaporization operations, a minimum of two operators will staff the West Holyoke Facility. When the West Holyoke Facility is not staffed for operations, security, process and hazard alarms will continue to be monitored by the HG&E's 24/7 dispatch center. As required by State regulations, the West Holyoke Facility is inspected daily when not staffed.

The West Holyoke Facility operators will continue to be properly trained and qualified to perform the required duties pertaining to West Holyoke Facility operations in accordance with all applicable federal and state regulations. HG&E will also continue to verify that all West Holyoke Facility personnel are "Fit for Duty" and do not have any physical conditions that would prevent them from executing their assigned duties.

HG&E will continue to maintain all training records of West Holyoke Facility personnel. Such records provide information regarding the training that each employee has received, including whether they have satisfactorily completed the required training programs and have comprehended the contents of the program.



GENERAL NOTES

- ONLY MAJOR EQUIPMENT AND TIE POINTS ARE CALLED OUT. NOT ALL PIPING SHOWN ON THIS DRAWING. REFER TO SUBSEQUENT SHEETS FOR ADDITIONAL INFORMATION.

Holyoke Gas & Electric
EFSB 22-07
Figure 2-1
Page 1 of 1

NO.	DATE	DESCRIPTION	BY
C	10/26/22	REVISED FOR FEED REPORT	JDH
B	9/1/22	REVISED FOR FEED REPORT	JDH
A	08/29/22	PRELIM DRAFT ISSUED TO HGAE FOR REVIEW	JDH

SANBORN HEAD

DRAWN BY:	JDH
DESIGNED BY:	JMK
REVIEWED BY:	JDH
PROJECT MGR:	JDH
PIC:	CJF
DATE:	08/20/22

PROGRESS NOT FOR CONSTRUCTION

LNG INFRASTRUCTURE & RESILIENCY PROJECT
HOLYOKE GAS & ELECTRIC
WEST HOLYOKE LNG FACILITY
 HOLYOKE, MASSACHUSETTS

PARTIAL SITE PLAN - AREA 1
GENERAL ARRANGEMENT

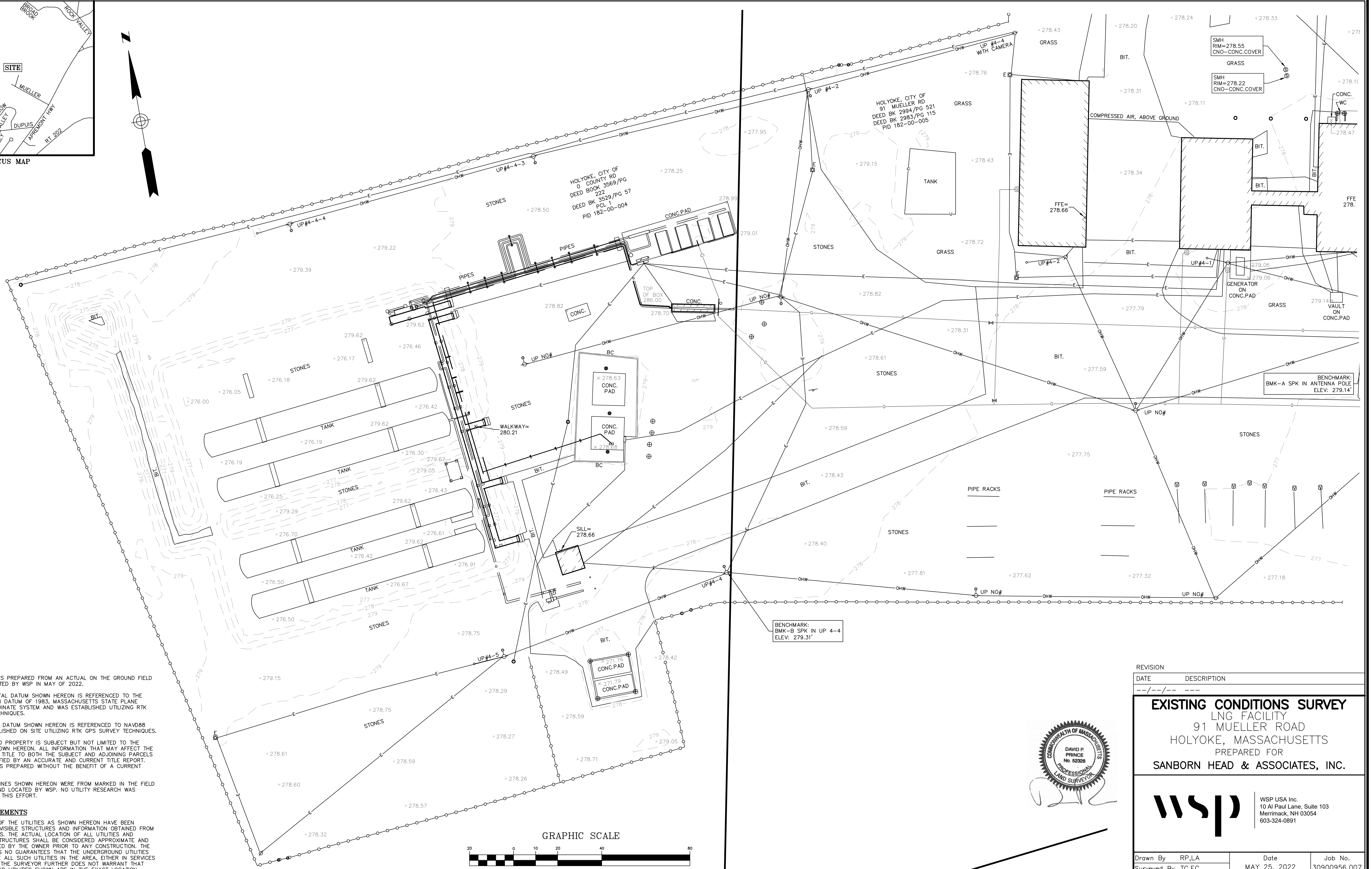
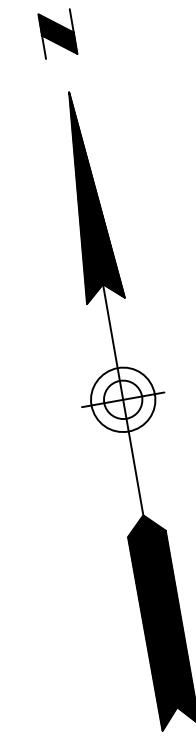
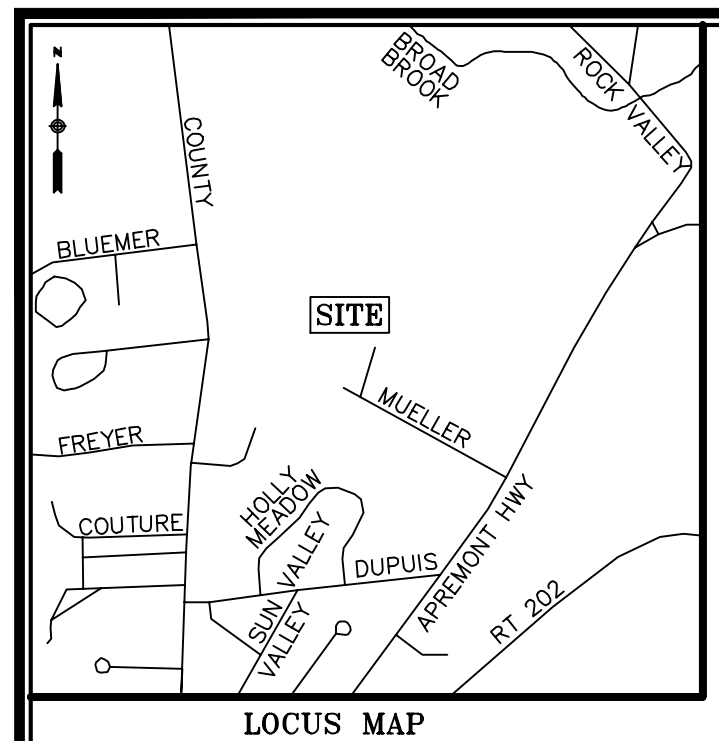
PARTIAL SITE PLAN - AREA 1 - GENERAL ARRANGEMENT

1

1/16" = 1'-0"

PROJECT NUMBER:
5201.01

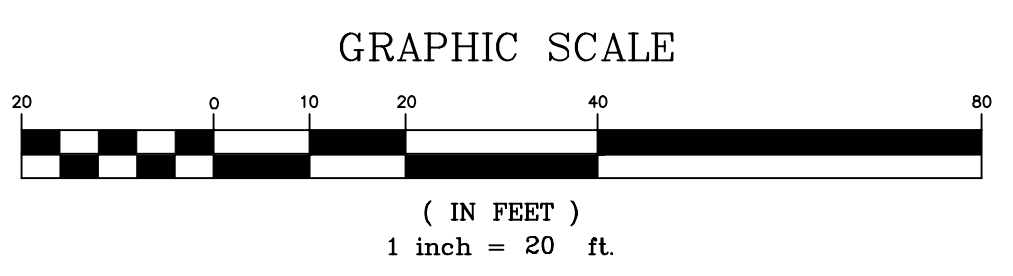
SHEET NUMBER:
M-0104-01



- NOTES**
1. THIS PLAN WAS PREPARED FROM AN ACTUAL ON THE GROUND FIELD SURVEY CONDUCTED BY WSP IN MAY OF 2022.
 2. THE HORIZONTAL DATUM SHOWN HEREON IS REFERENCED TO THE NORTH AMERICAN DATUM OF 1983, MASSACHUSETTS STATE PLANE MAINLAND COORDINATE SYSTEM AND WAS ESTABLISHED UTILIZING RTK GPS SURVEY TECHNIQUES.
 3. THE VERTICAL DATUM SHOWN HEREON IS REFERENCED TO NAVD88 AND WAS ESTABLISHED ON SITE UTILIZING RTK GPS SURVEY TECHNIQUES.
 4. THE SURVEYED PROPERTY IS SUBJECT BUT NOT LIMITED TO THE INFORMATION SHOWN HEREON. ALL INFORMATION THAT MAY AFFECT THE QUALITY OF THE TITLE TO BOTH THE SUBJECT AND ADJOINING PARCELS SHOULD BE VERIFIED BY AN ACCURATE AND CURRENT TITLE REPORT. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A CURRENT TITLE REPORT.
 5. THE UTILITY LINES SHOWN HEREON WERE FROM MARKED IN THE FIELD BY GPRS INC. AND LOCATED BY WSP. NO UTILITY RESEARCH WAS PERFORMED FOR THIS EFFORT.

UTILITY STATEMENTS

THE LOCATION OF THE UTILITIES AS SHOWN HEREON HAVE BEEN COMPILED FROM VISIBLE STRUCTURES AND INFORMATION OBTAINED FROM VARIOUS SOURCES. THE ACTUAL LOCATION OF ALL UTILITIES AND UNDERGROUND STRUCTURES SHALL BE CONSIDERED APPROXIMATE AND SHALL BE VERIFIED BY THE OWNER PRIOR TO ANY CONSTRUCTION. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICES OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED.



REVISION		
DATE	DESCRIPTION	
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EXISTING CONDITIONS SURVEY		
LNG FACILITY		
91 MUELLER ROAD		
HOLYOKE, MASSACHUSETTS		
PREPARED FOR		
SANBORN HEAD & ASSOCIATES, INC.		
wsp		WSP USA Inc. 10 Al Paul Lane, Suite 103 Merrimack, NH 03054 603-324-0891
Drawn By	RP,LA	Date
Surveyed By	TC,EC	MAY 25, 2022
Checked By	DPP	Scale
Book No.	CHA-85	1" = 100'
Job No.		30900956.007
Sheet No.		2 OF 2