September 20, 2022

Mr. John K. Westerling, MPA
Director of Public Works
Hopkinton Department of Public Works
83 Wood Street, PO Box 209
Hopkinton, MA 01748

Re: **Hopkinton-Southborough Interconnection Evaluation**
Hopkinton Department of Public Works
Hopkinton, MA
(Pare Project No. 21163.00)

Dear Mr. Westerling:

Pare Corporation (Pare) is pleased to present our evaluation of a proposed interconnection between the Town of Hopkinton (Hopkinton) and the Town of Southborough (Southborough) water supply systems. The purpose of this study is to evaluate the feasibility of Hopkinton connecting to the Massachusetts Water Resources Authority (MWRA) indirectly through Southborough. The following sections include a project overview, the methodology and results of the evaluation, a discussion of project cost, and the next steps in support of the proposed interconnection project.

OVERVIEW

Hopkinton is a growing community located approximately 25 miles west of Boston, MA. According to the 2020 United States census, Hopkinton has a population of 18,758 people, an increase of 25.7% since the 2010 census. The Hopkinton water supply system is reported to serve a population of 9,507 people through 3,716 service connections, or approximately 51% of Hopkinton's population. The system is currently served by eight (8) groundwater wells and water purchased from the Town of Ashland. During the summer months, Hopkinton struggles to meet summertime demand when the groundwater table is low from lack of rainfall. This issue will only be exacerbated as existing residents and new residents connect to the water system. In addition to demand challenges, Hopkinton's current supply has water quality challenges. Specifically, all of Hopkinton's wells require some degree of iron and manganese removal, and, more recently, some of the wells require PFAS removal. Upgrading existing wells will require the construction of treatment facilities to provide a reliable source of potable water that meets or exceeds current and foreseeable future proposed drinking water regulations (e.g., iron and manganese, PFAS, etc.).

In lieu of upgrading these wells, Hopkinton requested Pare evaluate the feasibility of connecting to the MWRA through a direct or indirect connection in the Town of Southborough. MWRA's infrastructure in Southborough consists of two buried aqueducts – the Metrowest Water Supply Tunnel (MWWST) and the Hultman Aqueduct. The Hultman Aqueduct and the MWWST are connected to the John J. Carroll Treatment Plant and transport water from the Plant in Marlborough to the Norumbega storage facility in Weston. The Hultman Aqueduct varies in diameter from 12.5 to 14 feet and varies in depth from 4 feet to 300 feet below ground. The MWWST is a 14-foot diameter tunnel that varies in depth from 200 feet to 500 feet below ground. Southborough has two connections to the Hultman Aqueduct, one at the Boland pump station and one at the Hosmer pump station, and one connection to the MWWST at the Hosmer pump station. Given the size and

depth of the aqueducts and given their critical nature to MWRA's overall transmission system, it is unlikely that Hopkinton would be allowed to install a new connection directly to one of the two aqueducts and would most likely be required to utilize one or two of Southborough's existing connections. As such, a direct connection to MWRA would likely occur at either the Boland pump station or the Hosmer pump station and would require the construction of a new pump station and several miles of new piping. With the exception of a shared connection point, either of these options would be completely separate from the Town of Southborough's water system, but the infrastructure would be installed in Town roadways and on Town property. A new connection at the Boland pump station would require approximately 29,500 feet of new pipe in Southborough, while a connection at the Hosmer pump station would require approximately 17,400 feet of new piping. There are a number of complicating factors for both of these options. Both options would require a new pipe crossing across Rt. 9, a busy four-lane state highway. Hopkinton may also want to consider higher pressure rated pipe and/or joints for much of the pipe in Southborough due to the high pressure under which this pipe will operate. It is expected that at least some of the new pipe would be subject to pressures in excess of 150 psi, due to the pressure required to move the water between the proposed pump stations and Hopkinton's water storage tanks. While this pressure is well within the pressure rating of ductile iron pipe, the damage that could be done to roadways and infrastructure if one of these new pipes leaked could be significant at this elevated pressure. To reduce the likelihood of a potentially catastrophic event, Hopkinton could consider higher pressure-rated pipe and/or joints. In consideration of these issues, the cost of a new direct connection to MWRA at the Boland pump station, including the pump station, pipe, meter vault, engineering, design, permitting, and a contingency of 25% is expected to be approximately $40 million. The cost for the same from Hosmer is expected to be approximately $31 million.

In light of the costs of a direct connection to MWRA, the focus of this evaluation is an indirect connection. An indirect connection would entail connecting to Southborough's system and buying water directly from Southborough. An indirect connection would require upgrades to Southborough's system to facilitate the purchase and transport of additional water to Hopkinton. The purpose of this study is to evaluate if Southborough's existing water distribution system is capable of supplying Hopkinton via an indirect connection to MWRA and identify upgrades required to make an indirect connection feasible; upgrades in both the Southborough and Hopkinton water supply systems. Pare performed a hydraulic evaluation of this proposed interconnection and prepared an opinion of probable construction cost (OPCC) for the proposed system upgrades, as described in the following section.

HYDRAULIC EVALUATION METHODOLOGY

At the onset of the project, Pare reviewed and analyzed Hopkinton's existing hydraulic model and updated the model to reflect recent improvements in Hopkinton's water supply system. Pare then utilized Hopkinton's model and Southborough's model to perform a hydraulic assessment of both systems. Because the models were developed in different modeling platforms, Pare did not combine the models into one single model. Instead, Pare ran each model independently and used the output from one model as a boundary condition for the other model.

The hydraulic assessments were performed in general accordance with American Water Works Association (AWWA) *Document M32 – Computer Modeling of Water Distribution Systems*. Each model was used to evaluate the systems' performance relative to guidelines and standards established by AWWA, as well as *Recommended Standards for Water Works (Ten State Standards)* and the Massachusetts Department of Environmental Protection's (Mass DEP) *2001 Guidelines and Policies for Public Water Systems.*

SOUTHBOROUGH HYDRAULIC EVALUATION

Pare utilized Southborough's existing computerized hydraulic model to evaluate what impact an indirect connection between Hopkinton and MWRA would have on Southborough's water distribution system. It is our understanding that Hopkinton would like to utilize MWRA as its primary source of water. Therefore, this hydraulic evaluation considered a number of demand scenarios, up to and including a scenario when Hopkinton receives up to 2.7 million gallons per day (MGD) from MWRA, which is the current maximum day demand (MDD) plus an additional 50 percent of MDD for future buildout. Pare added the proposed demands in the Southborough model along the Hopkinton/Southborough town line at Route 85 (Cedar Street in Hopkinton).

When evaluating this additional demand on Southborough's system, Pare reviewed three aspects of Southborough's system, as described below.

1. Supply capacity – Southborough's access to adequate supply from MWRA;

2. Storage capacity – the system's distribution storage available for system equalization (i.e., varying daily demands), fire flow volume, and emergency storage volume.

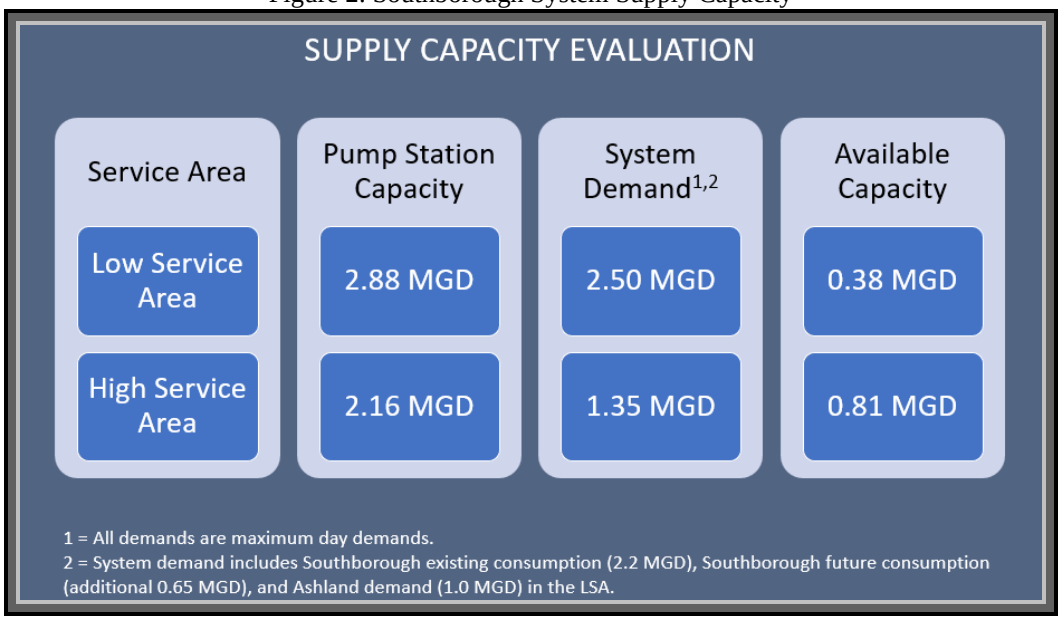
3. System pressure and fire flow – the system's pipe network and how the added demand affects pressure in Southborough, how the added demand affects the level of service existing customers receive, and how the added demand affects fire flow in the system.

Figure 1: Proposed interconnection located at Route 85 (Image source: Google Earth)

Supply Evaluation

Southborough's water supply system conveys water to their distribution pipe network from two pump stations connected to the MWRA – the Hosmer pump station and Boland pump station. The Hosmer pump station serves Southborough's Low Service Area (LSA) and has a capacity of approximately 2.88 MGD, while the Boland pump station serves Southborough's High Service Area (HSA) and has a capacity of approximately 2.16 MGD. For the purposes of this evaluation, Pare assumed that the Southborough demand includes existing MDD (2.2 MGD), future buildout consumption (0.65 MGD), and demand allotted to Ashland through the recently constructed Ashland-Southborough interconnection (1 MGD). When the future demand is distributed between the two service areas, future MDD would be approximately 2.5 MGD in the LSA (including 1 MGD for Ashland) and 1.35 MGD in the HSA. This results in an available source capacity of approximately 0.38 MGD in the LSA (Hosmer) and 0.81 MGD in the HSA (Boland), or a total available source capacity of 1.19 MGD (see Figure 2). This unallocated source capacity could potentially be allocated to Hopkinton, but that determination would need to be made by Southborough. For the purposes of this evaluation, Pare assumed that Hopkinton and Southborough could reach an agreement where the unallocated source capacity is allocated to Hopkinton. Utilizing the Hopkinton future MDD of 2.7 MGD, this results in an additional capacity needed to supply Hopkinton through Southborough of 1.51 MGD.

Figure 2: Southborough System Supply Capacity



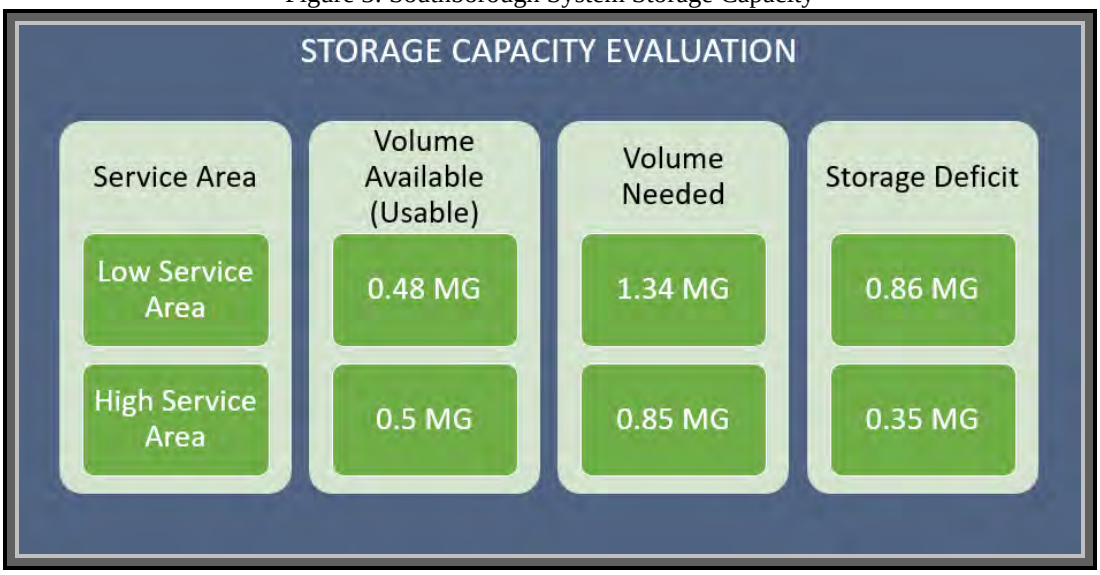
Storage Capacity Evaluation

In addition to supply capacity, storage capacity in Southborough was evaluated. Southborough stores water in their distribution system at three tanks – the Clear Hill (0.46 MG) and Oak Hill (0.275 MG) tanks in the LSA and the Tara Road (1.3 MG) tank in the HSA. While the total capacity in the system is 2.04 MG, the usable storage volume[1] in the system is 0.98 MG. To determine the usable storage, Pare took the elevation of the highest service connection and added 46 feet (i.e., 20 psi x 2.31) to establish the minimum usable water level in the system tanks. Based on this assessment, the usable storage volume in the HSA is approximately 0.5 MG, while the LSA is approximately 0.48 MG.

A water supply system should have the adequate storage capacity to provide the system with water for use on a day-to-day basis (i.e., equalization storage), fire flow events, and an emergency condition. Based on the water use patterns in the system and AWWA's standards for water storage, the volume of equalization storage required to meet peak-hour demands is estimated to be approximately 15 percent of the buildout maximum day demand (LSA = 0.38 MG, HSA = 0.2 MG). The required fire storage volume is determined by multiplying the required flow duration (in minutes) by the maximum fire flow (in gallons per minute) in the service area[2] (LSA = 0.63 MG, HSA = 0.54 MG). For emergency storage, Pare assumed 20 percent of a buildout average day would be an adequate volume to initiate an emergency response[3] (LSA = 0.33 MG, HSA = 0.11 MG). Accordingly, the volume needed in the system is 2.19 MG, leaving a storage capacity deficit of approximately 1.2 MG (see Figure 3). The addition of the Hopkinton demand will only exacerbate this supply issue, with additional storage needed to supply Hopkinton with approximately 0.41 MG[4]. Hopkinton's additional demand would increase Southborough's storage deficit from 1.2 MG to 1.61 MG.

[1] The usable storage volume is defined as the volume of water above an elevation that would provide a minimum of 20 pounds per square inch (psi) to the entire service area.
[2] Based on 3,500 gpm and 3,000 gpm maximum fire flow for a duration of 3 hours for the LSA and HSA, respectively.
[3] Based on a buildout average day demand of 0.57 MGD in the HSA and 1.64 MGD in the LSA (including 1 MGD for Ashland).
[4] Based on same criteria used for Southborough's storage evaluation – 15% of Hopkinton's buildout MDD (2.7 MGD) - was added for equalization. It is assumed that Hopkinton would rely on its own storage tanks for fire protection and emergency storage and therefore those two storage components were not included in the storage assessment.

Figure 3: Southborough System Storage Capacity



Pressure Evaluation

With regard to the conveyance of water from MWRA to Hopkinton through the Southborough water supply system, Pare performed a hydraulic model evaluation of the impact of Hopkinton's demand on Southborough's infrastructure. The model was used to compare system performance against a number of criteria.

- *Ten State Standards* recommend that system pressure range from 35-80 psi during normal operating conditions and never below 20 psi during emergency conditions, which is consistent with the Mass DEP's guidelines for public water systems. At a minimum, the proposed interconnection cannot cause any system nodes to fall below 20 psi. Please note that there are certain nodes in the model that are normally below 20 psi, such as those at the base of tanks and on the suction side of the pump stations. These nodes were excluded from the model evaluation.
- Pare also reviewed how many nodes fell below the 35-80 psi range established by *Ten State Standards.* One of the goals of this assessment is to identify potential system upgrades that would be needed to minimize the impact of the interconnection, as measured by the number of nodes that fall below 35 psi.
- Finally, Pare reviewed the impact on the overall level of service received by Southborough customers. This last criterion is more subjective and is not outlined in *Ten State Standards* or the Mass DEP. While there are no firm criteria to measure the level of service, it is generally accepted that significant fluctuations in pressure from one day to another or significant reductions in pressure below what customers are accustomed to seeing are considered to be indicators of poor service. Pare established a 10 percent reduction in "normal" pressure as a benchmark for service decline. That is to say, Pare evaluated how many nodes in the model had a pressure drop of more than 10 percent due to the proposed Hopkinton connection.

Because Hopkinton desires to have the new interconnection become their sole supply, the interconnection would need to supply Hopkinton under all demand scenarios, from wintertime demand to the highest water use days in the summer. Therefore, Pare evaluated the impact of Hopkinton's demand on Southborough's infrastructure through an analysis of several demand scenarios. These scenarios were created to establish how Southborough's system performs without the added demand of Hopkinton and how Southborough's system would perform with the added demand if certain upgrades were constructed.

These scenarios are listed below.

- Scenario 1 – Southborough ADD (no Hopkinton demand);
- Scenario 2 – Southborough ADD with Hopkinton ADD and various system upgrade options;
- Scenario 3 – Southborough MDD (no Hopkinton demand);
- Scenario 4 – Southborough MDD with Hopkinton MDD and various system upgrade options;
- Scenario 5 – Southborough MDD (Buildout, no Hopkinton Demand); and
- Scenario 6 – Southborough MDD (Buildout) with Hopkinton MDD (Buildout – 2.7 MGD) and various system upgrade options.

All demand scenarios were evaluated under a conservative condition in which the Southborough pumps are offline, and their system tanks are drained to 10 feet below overflow elevation to simulate the approximate bottom of equalization storage. For scenarios that included Hopkinton's demand (Scenarios 2, 4, and 6), Pare evaluated several system upgrade options (see below) that are intended to reduce the impact that Hopkinton's demand has on the level of service delivered to the Southborough customers. The last scenario, Scenario 6 is the highest demand scenario evaluated by Pare and was utilized as a benchmark when evaluating potential upgrades in Southborough. Only those upgrades that could meet the pressure and level of service criteria during the highest demand scenario were considered viable options for this project.

To transfer 2.7 MGD to Hopkinton through Southborough, Pare evaluated four options for conveying water from MWRA, through Southborough to Hopkinton, as described below.

- Option 1 – Convey water to Hopkinton entirely through the Southborough HSA (i.e., from Boland to the Hopkinton town line);
- Option 2 – Convey water to Hopkinton entirely through the Southborough LSA (i.e., from Hosmer to the Hopkinton town line);
- Option 3 – Convey water to Hopkinton through a combination of Southborough's HSA and LSA (i.e., the total demand is split between Boland and Hosmer); and
- Option 4 – Eliminate the separate service areas in Southborough and supply Hopkinton through a new combined single service area with a hydraulic grade that matches the hydraulic grade of Southborough's Tara Road tank (i.e., 515 ft MSL).

Option 1 (Southborough HSA) includes approximately 12,800 feet of new water main on Parkerville Road and Highland Street, substantial upgrades to Southborough's Boland pump station, and new storage in the HSA (see Attachment A). This option causes pressure at 5 of the 375 nodes in the HSA to fall below 20 psi, particularly in the Fairview/Skylar Drive neighborhood. This option also caused pressure in a number of areas to fall below the recommended pressure of 35 psi. A total of 28 nodes were below 35 psi, including in the areas of the Fairview/Skylar Drive neighborhood, near the Tara Road tank, and near the Ledge Hill PRV. The level of service would be significantly impacted by Option 1, which would cause pressure at 236 nodes to drop by more than 10 percent. Finally, Option 1 caused a significant reduction in available fire flow. Specifically, available fire flow is restricted system-wide by inadequate pressures (i.e., below 20 psi) in the Fairview/Skylar Drive neighborhood under the proposed buildout conditions.

Option 2 (Southborough LSA) includes 10,000 feet of new water main (on Woodland Road and River Street) and substantial upgrades to Southborough's Hosmer pump station (see Attachment B). New storage would also be required in the LSA. While this option did not cause the pressure in any nodes to drop below 20 psi, it did cause pressure in a number of areas to fall below the recommended pressure of 35 psi. A total of 35 nodes were below 35 psi, including in the areas of the Fairview/Skylar Drive neighborhood, Carriage Hill Circle, Davis Rd, Kidder Lane, and Atwood Street. The level of service in the HSA would be significantly impacted

by Option 2, which would cause pressure at 378 nodes to drop by more than 10 percent. While existing fire flow can be maintained under this option, the upgrades at Hosmer would result in excessive pressures in some areas of the system, particularly on Boston Road near the base of the Sudbury Reservoir.

Option 3 would convey water through the HSA and LSA to Hopkinton. This option would include upgrades to both the Hosmer and Boland pump stations, upgrades to the Oak Hill tank, and piping upgrades near the proposed interconnection. Additionally, this option would require a direct feed to Ashland to prevent pressure loss at their interconnection. However, attempts to serve the interconnection from both the HSA and LSA resulted in reductions in service and available fire flow to customers in the HSA. This option causes pressure at 4 of the 781 nodes in the system to fall below 20 psi, particularly in the Fairview/Skylar Drive neighborhood. This option also caused pressure in a number of areas to fall below the recommended pressure of 35 psi. A total of 37 nodes were below 35 psi, including in the areas of the Fairview/Skylar Drive neighborhood, near the Tara Road and Oak Hill tanks, and near the Ledge Hill PRV. The level of service would be significantly impacted by Option 3, which would cause pressure at 143 nodes to drop by more than 10 percent. Finally, Option 3 caused a significant reduction in available fire flow. Specifically, available fire flow is restricted system-wide by inadequate pressures (i.e. below 20 psi) in the Fairview/Skylar Drive neighborhood under the proposed buildout conditions.

The first three options evaluated performed relatively poorly. For all three options, the added demand for Hopkinton caused pressure to fall in many parts of Southborough's system, particularly during the highest demand scenario, which is Hopkinton's future summertime demand coincident with Southborough's future summertime demand. While the pressure did not decrease significantly in terms of absolute pressure drop, the pressure did decrease enough to cause some nodes to fall below 35 psi or in some cases to fall below 20 psi. Most of these nodes were only slightly above 35 psi or 20 psi before the added demand of Hopkinton, but the goal of this assessment is to implement upgrades that prevent any nodes from dropping below 35 psi or more importantly below 20 psi. These options also caused a number of nodes to drop by 10 percent or more, which was deemed undesirable for this project. Finally, these three options had a generally poor impact on overall fire protection in the system, reducing available fire flow in some areas of the Town.

The neighborhood around Fairview Drive and Skylar Drive, which is in the HSA, is one of the primary factors in the poor performance of these three options. Because this neighborhood is located a significant distance from a water storage tank it is relatively susceptible to changes in pressure that would occur during a high flow event, such as a peak demand period or a fire event in the system. In addition, much of this neighborhood is near the top of a hill, which means pressures in this neighborhood are relatively low. The combination of these two circumstances means that flow in the piping network outside of this neighborhood must be limited to prevent pressures in this neighborhood from falling below 35 psi or 20 psi. To accommodate this limitation, much of Hopkinton's demand would need to be directed through the LSA; however, forcing most of Hopkinton's demand through the LSA causes customers in the LSA to experience significant changes in their level of service. Therefore, a desirable option would be to balance the flow between the two service areas but make accommodations in the Fairview Drive and Skylar Drive neighborhood to maintain their pressure above 35 psi. Balancing the flow between the two service areas could be achieved but is complicated by the fact that the HSA has a hydraulic grade line approximately 23 feet above that of the LSA, and as such more water will naturally flow through the HSA than the LSA. To address these issues, a fourth option was developed.

Option 4 (Combined Southborough Service Area) includes replacing the Oak Hill tank (overflow elevation = 492.7 feet) with a taller, larger tank that would match the overflow elevation of the Tara Road tank (overflow elevation = 515 feet). This option would also include removal of the Overlook (Clear Hill) tank and include upgrades to both Boland and Hosmer pump stations, as well as approximately 4,800 feet of new water main. As part of this option, a new booster pump would be added to the Fairview/Skylar Drive neighborhood and a

pressure-reducing valve would be added to Boston Road (see Attachment D). The effect of these upgrades would be to eliminate the two large service areas in Town and maintain the system as primarily one service area with a single hydraulic grade line. The exception would be the Fairview/Skylar Drive neighborhood, which would be isolated from the rest of the system and maintained as a small booster zone.

The proposed piping upgrades are in 2 areas of the system – approximately 2,000 feet of new 12" water main at the Hopkinton interconnection (see Figure 4) and 2,800 feet of new 12" water main on Parkerville Road. The piping upgrades at the Hopkinton interconnection are required to minimize pressure loss and reduce high velocities in existing pipes as well as provide a connection to Hopkinton at the town line. The water main upgrades on Parkerville Road would reduce pressure losses observed in the southwestern part of the system when serving Hopkinton.

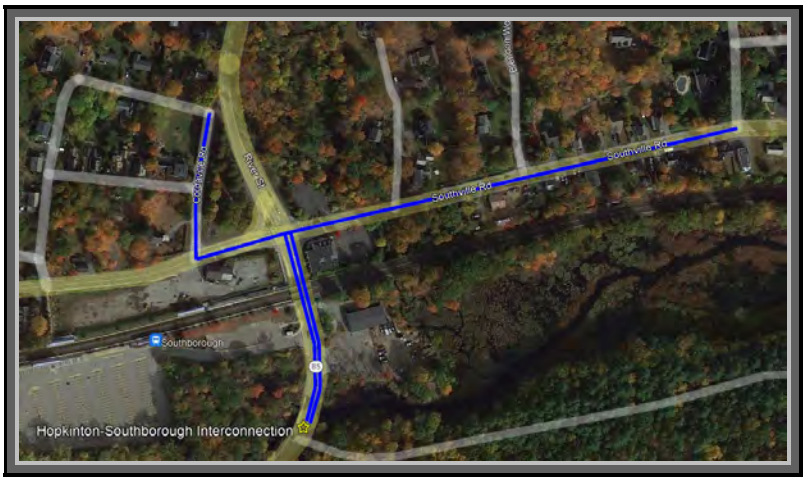


Figure 4: Proposed Southborough upgrades
Southborough-Hopkinton Interconnection
(Image source: Google Earth)

Both Hosmer and Boland's capacity would need to be increased – each station would need to be increased to approximately 3.3 MGD. Upgrades to Southborough's storage, which would include increasing the volume and raising the hydraulic grade line (HGL) of the Oak Hill tank, as well as demolishing the Overlook tank, would allow the system to operate as a single pressure zone. The upgrades to the Oak Hill tank would include the replacement of the existing tank with a new elevated storage tank, designed to provide 100% usable storage volume. While this would benefit the Hopkinton interconnection by minimizing pressure loss due to the new demand, it would also largely reduce the existing storage deficit in Southborough's system and improve overall pressure and fire flow in the southern portion of the town. A small booster pump station to feed the Fairview/Skylar Drive neighborhood, which currently experiences pressure below 35 psi, would be required to keep pressure in this area from dropping below 20 psi, as required by *Ten State Standards*. Finally, a PRV would need to be installed on Boston Road near the base of the Sudbury Reservoir, where pressure is already very high (>100 psi), because this area of the system would experience a pressure increase due to the improvements described above.

Table 1: Southborough Level of Service Evaluation

Southborough Pressures	Option 4 - Demand Scenario Comparison					
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
	Southborough ADD	Southborough/ Hopkinton ADD (with upgrades)	Southborough MDD	Southborough/ Hopkinton MDD (with upgrades)	Southborough Buildout MDD	Southborough Buildout MDD/ Hopkinton 2.7 MGD (with upgrades)
Nodes below 20 psi	0	0	0	0	0	0
Nodes below 35 psi	22	14	23	16	28	20
Nodes above 80 psi	416	478	380	430	353	365
Nodes with pressure drop above 10%	N/A	0	N/A	1	N/A	49

This option causes pressure at 0 of the 781 nodes in the system to fall below 20 psi and reduces the number of nodes that are below 35 psi in the future from 28 to 20. That is to say, in the future during Southborough's MDD without Hopkinton, 28 nodes will be below 35 psi. With the addition of Hopkinton's MDD and the improvements proposed as part of Option 4, this number drops to 20 nodes. The level of service would not be significantly impacted by Option 4, with only 49 nodes experiencing above a 10 percent drop in pressure and no pressure drop greater than 11 psi. The highest pressure drop in terms of percentage observed in this scenario was approximately 18%, dropping from 56 psi to 46 psi. It should be noted that the nodes in the LSA that would experience a 10 percent drop in pressure would also see a regular increase in pressure of about 10 psi due to the proposed increase in HGL in the existing LSA, with the reduction of service only experienced during temporary high-demand conditions. It should also be noted that this analysis was performed with the pump stations offline during a high demand scenario with the tanks at the bottom of their equalization. Under these conditions, the pumps would more than likely be on and the HGL of the entire system would be raised, mitigating the reduction in service. The number of nodes that would experience a drop in pressure above 10% would be far fewer than 49 nodes. However, the actual number of nodes would be based on the final design of the pump stations.

Option 4 also improves fire protection throughout the system, particularly in the southwestern section in the vicinity of the Fairview/Skylar Drive neighborhood. Available fire flow in this area is improved by isolating the Fairview/Skylar Drive neighborhood as a small booster zone, thereby isolating the high elevation nodes that were restricting available fire flow in the system.

For this evaluation, it was imperative that Hopkinton's interconnection have little to no impact on Ashland's recently constructed interconnection. The water transferred from Southborough to Ashland is dependent on the difference in pressure between the two systems (i.e., Ashland is served by gravity from Southborough – no pumping), therefore, by maintaining and improving pressures in Southborough's system, the improvements described above will minimize the impact to the Ashland interconnection.

The results of this level of service evaluation on Southborough's water supply system for Option 4 is summarized in Table 1. The modeling results from this hydraulic evaluation are provided in Attachment E.

Relative to *Ten State Standards* and Mass DEP guidelines, it appears that the Southborough system can sustain an acceptable level of service to its customers with up to 2.7 MGD conveyed from MWRA to Hopkinton under buildout conditions (Scenario 6, the highest overall demand scenario) with the upgrades proposed as part of Option 4.

HOPKINTON HYDRAULIC EVALUATION

Regarding the Hopkinton water supply system upgrades, Pare established hydraulic boundary conditions at the Hopkinton town line at Route 85 that served as the basis for the hydraulic assessment of Hopkinton's system. Pare utilized Hopkinton's hydraulic model to assess the capacity of their distribution system to accept up to 2.7 MGD from Southborough.

The proposed improvements include a new interconnection vault at the town line, new parallel 12" pipes from the town line to the intersection of Route 85 and Legacy Farms (including a causeway crossing for the Hopkinton Reservoir), a new 2.7 MGD pump station at this intersection, and 12" mains discharging from the pump station easterly on Legacy Farms to Wilson Street and southerly to an existing stub on Route 85 toward the Town Center (see Figure 5). The parallel pipes on the suction side of the pump station and two (2) discharge pipes provide redundancy and improved pump performance through smaller pumps. In addition, only minor changes in pressure would be observed in the Hopkinton system, with an approximate discharge pressure from the pump station of 620 feet mean sea level (MSL) – less than 10 psi above the system's HGL of 600 feet as determined by the system's storage tank overflow elevations. For the purposes of this evaluation, Pare did not include an evaluation of the chemical compatibility between the MWRA water and Hopkinton's treatment regimen.

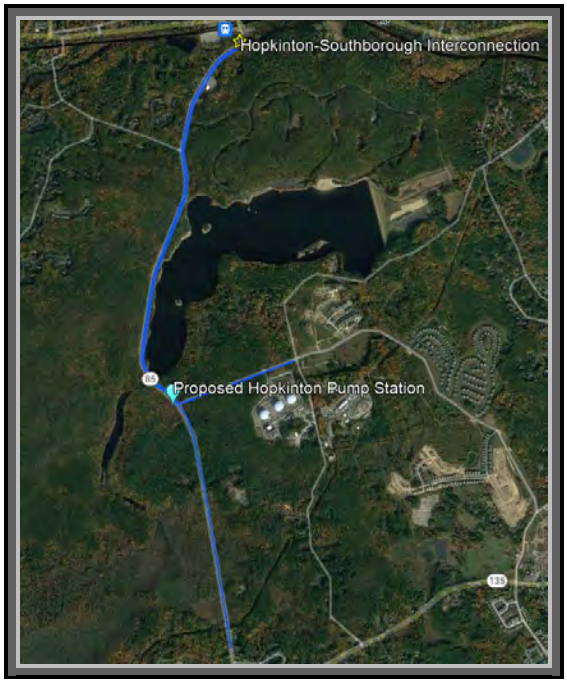


Figure 5: Proposed Hopkinton upgrades
(Image source: Google Earth)

While these updates are predicated on a future Hopkinton MDD of 2.7 MGD, it is understood that buildout is a dynamic process and therefore coordination with Southborough should be performed regarding their unused system capacity to further buffer any variations in the future buildout projections.

OPINION OF PROBABLE CONSTRUCTION COST (OPCC)

An OPCC for the proposed interconnection upgrades was also prepared, a summary of which is provided in the following table. It should be noted that this OPCC is similar to an Association for the Advancement of Cost Estimating (AACE) Class 4 estimate[5]. Class 4 estimates typically vary from 15-30% below to 20-50% above

[5] AACE International Recommended Practice No. 18R-97 "Cost Estimate Classification System - As Applied in Engineering, Procurement, and Construction for the Process Industries".

the projected cost. That said, this OPCC incorporates a 25% contingency into the project construction cost as well as an engineering services fee of 15% of the total design and construction cost.

Table 2: OPCC – Hopkinton-Southborough Interconnection Project

Description	Construction Subtotal	Contingency (25%)	Engineering (15%)	Total
Upgrades in the Town of Southborough				
Upgrade Water Mains Near Interconnection (12")	$800,000	$200,000	$150,000	$1,150,000
New Parkerville Water Main (12")	$1,100,000	$275,000	$206,000	$1,581,000
Oak Hill Tank Upgrades	$2,000,000	$500,000	$375,000	$2,875,000
Overlook Tank Demolition	$100,000	$25,000	$19,000	$144,000
Pump Station Upgrades (Hosmer & Boland)	$1,250,000	$313,000	$234,000	$1,797,000
New Pump Station Installation	$250,000	$62,000	$47,000	$359,000
Check Valve Installation (associated w/ new pump station)	$100,000	$25,000	$19,000	$144,000
Boston Road PRV Installation	$100,000	$25,000	$19,000	$144,000
			Subtotal	***$8,200,000***
Upgrades in the Town of Hopkinton				
Interconnection Vault Installation	$400,000	$100,000	$75,000	$575,000
New Dual 12" Water Mains (Station Suction)	$3,800,000	$950,000	$713,000	$5,463,000
Reservoir Causeway Crossing	$250,000	$62,000	$47,000	$359,000
New Pump Station Installation	$2,500,000	$625,000	$469,000	$3,594,000
New 12" Water Mains (Station Discharge)	$4,700,000	$1,175,000	$881,000	$6,756,000
			Subtotal	***$16,800,000***
			Hopkinton-Southborough Interconnection Project	**$25,000,000**

The costs for tank upgrades in Southborough assume that Hopkinton will contribute to Southborough's tank upgrades, but that Southborough would be completing some storage upgrades in the future. Pare estimated a $2,000,000 contribution from Hopkinton, but that would need to be negotiated with Southborough.

These costs do not include the costs of legal services for this project, nor the cost of any easement development or land acquisition.

DESIGN CONSIDERATIONS AND PERMITTING

There are a number of items that add complexity to this project that should be carefully reviewed before a final interconnection alternative is selected. Some of these issues that Pare is aware of currently, include:

1. The proposed interconnection crosses the Sudbury River at the Southborough/Hopkinton town line. There is already a bridge at this location, and it is Pare's understanding, based on conversations with the Massachusetts Department of Transportation (DOT), that there is already a 12-inch water main hanging beneath this bridge, presumably in anticipation of a new interconnection between Southborough and Hopkinton. Having a water main beneath this bridge is a significant benefit to this project; however, Pare recommends installing a second parallel 12-inch water main beneath the bridge to increase system redundancy. The addition of a new 12-inch water main will need to be coordinated with Mass DOT.
2. The proposed parallel water mains on Rt. 85 in Hopkinton will cross the Hopkinton Reservoir across a manmade causeway. While there is no reason to believe that these water mains could not be installed on the causeway, depending on the material of construction of the causeway the digging may be difficult, and installation could be challenging.
3. The Hopkinton pump station is proposed to be installed at the intersection of Rt. 85 and Legacy Farm. The property at this location is owned by the Massachusetts Department of Conservation and Recreation (DCR). The Town will need to seek an easement or land purchase from DCR prior to building this pump station.

This project will have very significant permitting. At a minimum, Pare believes the Town of Hopkinton will need to seek the following permits:

1. Mass DOT permits for the proposed bridge crossing over the Sudbury River, and work in Rt. 85.
2. MWRA permitting for the upgrades to the Hosmer and Boland pump stations.
3. Mass DEP permitting for the change in water supply to the Town, the upgrades to the Hosmer and Boland pump stations, and potentially the upgrades to one or more of Southborough's tanks.
4. Local conservation commission permitting for the work near the Hopkinton Reservoir and potentially for the new pump station at Legacy Farm/Rt. 85.
5. A Massachusetts Environmental Protection Act filing through the Massachusetts Executive Office of Energy and Environmental Affairs. This will include an Environmental Impact Report and an Inter-Basin Transfer Application since water will be transferred between two watersheds.

The permits may not represent the totality of all permits required for the project – others may become apparent as the design phase is advanced. In addition to these permits, Hopkinton will have to begin discussions with the MWRA on a potential usage agreement and the Town of Southborough on a potential Intermunicipal Agreement.

NEXT STEPS

Based on the results of the evaluation, it is recommended that Hopkinton meet with Southborough to discuss the proposed system upgrades (i.e., Option 4 – Combined Southborough Service Area upgrades) as well as the potential re-allocation of buildout supply capacity. Once a preferred interconnection alternative is established, Pare will prepare conceptual design drawings and an updated OPCC for review. A progress submission will be reviewed by both Hopkinton and Southborough prior to finalization of the conceptual design package. Once finalized, the Town of Hopkinton should begin the coordination process with Mass DEP and MWRA.

It should be noted that the costs presented above are based on the minimum required upgrades to convey the water from MWRA to Hopkinton. Southborough may request cost-sharing above what is presented herein to lessen the impact on their system or on capital improvements (such as tank upgrades) associated with the conveyance of MWRA water to Hopkinton as part of a proposed Intermunicipal Agreement.

If you have any questions or concerns, please don't hesitate to contact me at your convenience at (401) 334-4100.

Sincerely,

Timothy P. Thies, P.E.
Senior Vice President

TPT/SPD/NPM/kji

cc: Norman Khumalo – Town of Hopkinton
Shane P. Driscoll, P.E. – Pare Corporation
Nathan P. Meersman, P.E. – Pare Corporation

Enclosures
Attachment A – Option 1 Improvements Map
Attachment B – Option 2 Improvements Map
Attachment C – Option 3 Improvements Map
Attachment D – Option 4 Improvements Map
Attachment E – Southborough Level of Service Evaluation Data

ATTACHMENT A

OPTION 1 - HSA

N

LOW SERVICE
HIGH SERVICE

MARLBOROUGH

UPGRADES TO BOLAND PUMP STATION

BOLAND PUMP STATION

HULTMAN

METROWEST WATER SUPPLY TUNNEL

MARLBORO ROAD

SEARS ROAD

MAIN STREET

TOWN SQUARE PRV

LEDGE HILL PRV

CLEAR HILL
0.46 MG STORAGE TANK
OVERFLOW=493.3 FT

SUDBURY RESERVOIR

AQUEDUCT

FRAMINGHAM ROAD

HOSMER PUMP STATION

FAYVILLE DAM

MAIN STREET

CORDAVILLE ROAD

FRAMINGHAM

ADDITIONAL STORAGE IN HSA

TARA ROAD
1.3 MG STORAGE TANK
OVERFLOW=515.0 FT

DPW GARAGE

OAKHILL ROAD

OAK HILL
0.275 MG STORAGE TANK
OVERFLOW=492.7 FT

WESTBOROUGH

PARKERVILLE ROAD

MT. VICKERY PRV

WOODLAND ROAD

ASHLAND

PARKERVILLE ROAD PRV

HIGH SERVICE
LOW SERVICE

SOUTHVILLE ROAD

HOPKINTON

12,800 feet of 12" pipe

Legend

- Water Storage Tank
- Major Roads
- Pump Station
- PRV
- Hydrant
- Water Main
- Town Boundary

1 inch = 1,000 feet

1,000 500 0 1,000 2,000 3,000 4,000 Feet

PARE CORPORATION
ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LICOLN, RI 02865
401-334-4100

TOWN OF SOUTHBOROUGH
WATER SYSTEM MAP
SOUTHBOROUGH, MASSACHUSETTS

REVISIONS:

PROJECT NO:
DATE: JANUARY 2017
SCALE: AS NOTED

DRAWING TITLE: WATER SYSTEM MAP

DRAWING NO:

SHEET NO. 1 OF 1

ATTACHMENT B

OPTION 2 - LSA

N

LOW SERVICE
HIGH SERVICE

MARLBOROUGH

BOLAND PUMP STATION

HULTMAN

METROWEST WATER SUPPLY TUNNEL

SEARS ROAD

MAIN STREET

TOWN SQUARE PRV

495

TARA ROAD
1.3 MG STORAGE TANK
OVERFLOW=515.0 FT

9

PARKERVILLE ROAD

PARKERVILLE ROAD PRV

WESTBOROUGH

HIGH SERVICE
LOW SERVICE

MARLBORO ROAD

LEDGE HILL PRV

CLEAR HILL
0.46 MG STORAGE TANK
OVERFLOW=493.3 FT

SUDBURY
RESERVOIR

AQUEDUCT

FRAMINGHAM ROAD

UPGRADES TO HOSMER
PUMP STATION

HOSMER PUMP STATION

FAYVILLE DAM

MAIN STREET

CORDAVILLE ROAD

FRAMINGHAM

ADDITIONAL
STORAGE IN LSA

OAKHILL ROAD

OAK HILL
0.275 MG STORAGE TANK
OVERFLOW=492.7 FT

DPW GARAGE

MT. VICKERY PRV

CORDAVILLE ROAD

WOODLAND ROAD

90

ASHLAND

10,000 feet of 12" pipe

SOUTHVILLE ROAD

HOPKINTON

Legend

- Water Storage Tank
- Major Roads
- Pump Station
- PRV
- Hydrant
- Water Main
- Town Boundary

1 inch = 1,000 feet

1,000 500 0 1,000 2,000 3,000 4,000 Feet

PARE CORPORATION
ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LICOLN, RI 02865
401-334-4100

TOWN OF SOUTHBOROUGH
WATER SYSTEM MAP
SOUTHBOROUGH, MASSACHUSETTS

REVISIONS:

PROJECT NO:
DATE: JANUARY 2017
SCALE: AS NOTED

DRAWING TITLE: WATER SYSTEM MAP

DRAWING NO:

SHEET NO. 1 OF 1

ATTACHMENT C

OPTION 3 - COMBINATION OF HSA & LSA

N

LOW SERVICE
HIGH SERVICE

MARLBOROUGH

UPGRADES TO BOLAND PUMP STATION

BOLAND PUMP STATION

METROWEST WATER SUPPLY TUNNEL

HULTMAN AQUEDUCT

SUDBURY RESERVOIR

CLEAR HILL
0.46 MG STORAGE TANK
OVERFLOW=493.3 FT

LEDGE HILL PRV

MARLBORO ROAD

SEARS ROAD

FRAMINGHAM ROAD

UPGRADES TO HOSMER PUMP STATION

HOSMER PUMP STATION

FAYVILLE DAM

FRAMINGHAM

TOWN SQUARE PRV

MAIN STREET

CORDAVILLE ROAD

495

TARA ROAD
1.3 MG STORAGE TANK
OVERFLOW=515.0 FT

9

DPW GARAGE

OAKHILL ROAD

ADDITIONAL STORAGE IN LSA

OAK HILL
0.275 MG STORAGE TANK
OVERFLOW=492.7 FT

ASHLAND INTERCONNECTION

MT. VICKERY PRV

PARKERVILLE ROAD

WESTBOROUGH

PARKERVILLE ROAD PRV

WOODLAND ROAD

90

ASHLAND

HIGH SERVICE
LOW SERVICE

SOUTHVILLE ROAD

HOPKINTON

5,200 feet of 12" pipe

Legend

- Water Storage Tank
- Major Roads
- Pump Station
- PRV
- Hydrant
- Water Main
- Town Boundary

1 inch = 1,000 feet

1,000 500 0 1,000 2,000 3,000 4,000 Feet

PARE CORPORATION
ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LICOLN, RI 02865
401-334-4100

TOWN OF SOUTHBOROUGH
WATER SYSTEM MAP
SOUTHBOROUGH, MASSACHUSETTS

REVISIONS:

PROJECT NO:
DATE: JANUARY 2017
SCALE: AS NOTED

DRAWING TITLE: WATER SYSTEM MAP

DRAWING NO:

SHEET NO. 1 OF 1

ATTACHMENT D

OPTION 4 - COMBINED SERVICE AREA

N

COMBINED SERVICE AREA

LOW SERVICE
HIGH SERVICE

MARLBOROUGH

UPGRADES TO BOLAND PUMP STATION

BOLAND PUMP STATION

DEMOLISH OVERLOOK (CLEAR HILL) STORAGE TANK

CLEAR HILL
0.46 MG STORAGE TANK
OVERFLOW=493.3 FT

LEDGE HILL PRV

SUDBURY RESERVOIR

HULTMAN AQUEDUCT

METROWEST WATER SUPPLY TUNNEL

UPGRADES TO HOSMER PUMP STATION

HOSMER PUMP STATION

FAYVILLE DAM

MARLBORO ROAD

SEARS ROAD

FRAMINGHAM ROAD

MAIN STREET

TOWN SQUARE PRV

CORDAVILLE ROAD

FRAMINGHAM

PRESSURE REDUCING VALVE ON BOSTON ROAD

TARA ROAD
1.3 MG STORAGE TANK
OVERFLOW=515.0 FT

UPGRADES TO OAK HILL STORAGE TANK

OAKHILL ROAD

OAK HILL
0.275 MG STORAGE TANK
OVERFLOW=492.7 FT

NEW PUMP STATION FOR FAIRVIEW/SKYLAR DRIVE NEIGHBORHOOD

WESTBOROUGH

DPW GARAGE

2,800 FT OF 12" WATER MAIN ON PARKERVILLE ROAD

PARKERVILLE ROAD

MT. VICKERY PRV

WOODLAND ROAD

ASHLAND INTERCONNECTION

ASHLAND

TWO (2) CHECK VALVES ON FAIRVIEW DRIVE & SKYLAR DRIVE

PARKERVILLE ROAD PRV

HIGH SERVICE
LOW SERVICE

SOUTHVILLE ROAD

HOPKINTON

2,000 FT OF 12" WATER MAIN

HOPKINTON INTERCONNECTION

Legend

- Valve
- Water Storage Tank
- Pump Station
- PRV
- Hydrant
- Water Main
- Major Roads
- Town Boundary

1 inch = 1,000 feet

1,000 500 0 1,000 2,000 3,000 4,000 Feet

PARE CORPORATION
ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LICOLN, RI 02865
401-334-4100

TOWN OF SOUTHBOROUGH
WATER SYSTEM MAP
SOUTHBOROUGH, MASSACHUSETTS

REVISIONS:

PROJECT NO:
DATE: DECEMBER 2021
SCALE: AS NOTED

DRAWING TITLE: WATER SYSTEM MAP

APPENDIX A

ATTACHMENT E

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-10	98	J-10	103	-5	-5.1%	J-10	94	J-10	97	-3	-3.2%	J-10	92	J-10	89	3	3.26%
J-100	52	J-100	51	1	1.9%	J-100	52	J-100	49	3	5.8%	J-100	51	J-100	47	4	7.84%
J-101	54	J-101	53	1	1.9%	J-101	53	J-101	51	2	3.8%	J-101	53	J-101	49	4	7.55%
J-102	77	J-102	85	-8	-10.4%	J-102	76	J-102	83	-7	-9.2%	J-102	74	J-102	81	-7	-9.46%
J-103	77	J-103	86	-9	-11.7%	J-103	77	J-103	83	-6	-7.8%	J-103	74	J-103	81	-7	-9.46%
J-104	84	J-104	83	1	1.2%	J-104	83	J-104	80	3	3.6%	J-104	83	J-104	77	6	7.23%
J-105	85	J-105	84	1	1.2%	J-105	84	J-105	81	3	3.6%	J-105	84	J-105	78	6	7.14%
J-106	34	J-106	34	0	0.0%	J-106	33	J-106	31	2	6.1%	J-106	33	J-106	29	4	12.12%
J-107	34	J-107	34	0	0.0%	J-107	33	J-107	31	2	6.1%	J-107	33	J-107	29	4	12.12%
J-108	97	J-108	105	-8	-8.2%	J-108	96	J-108	103	-7	-7.3%	J-108	94	J-108	101	-7	-7.45%
J-109	97	J-109	106	-9	-9.3%	J-109	96	J-109	104	-8	-8.3%	J-109	95	J-109	101	-6	-6.32%
J-11	58	J-11	65	-7	-12.1%	J-11	55	J-11	61	-6	-10.9%	J-11	53	J-11	57	-4	-7.55%
J-110	73	J-110	72	1	1.4%	J-110	72	J-110	71	1	1.4%	J-110	72	J-110	69	3	4.17%
J-111	73	J-111	73	0	0.0%	J-111	73	J-111	71	2	2.7%	J-111	72	J-111	70	2	2.78%
J-112	101	J-112	100	1	1.0%	J-112	100	J-112	97	3	3.0%	J-112	99	J-112	95	4	4.04%
J-113	101	J-113	101	0	0.0%	J-113	100	J-113	98	2	2.0%	J-113	100	J-113	96	4	4.00%
J-114	94	J-114	102	-8	-8.5%	J-114	92	J-114	100	-8	-8.7%	J-114	91	J-114	97	-6	-6.59%
J-115	94	J-115	102	-8	-8.5%	J-115	92	J-115	100	-8	-8.7%	J-115	91	J-115	97	-6	-6.59%
J-116	91	J-116	98	-7	-7.7%	J-116	88	J-116	92	-4	-4.5%	J-116	86	J-116	85	1	1.16%
J-117	91	J-117	98	-7	-7.7%	J-117	88	J-117	92	-4	-4.5%	J-117	86	J-117	85	1	1.16%
J-118	86	J-118	95	-9	-10.5%	J-118	85	J-118	92	-7	-8.2%	J-118	83	J-118	90	-7	-8.43%
J-119	86	J-119	95	-9	-10.5%	J-119	86	J-119	93	-7	-8.1%	J-119	84	J-119	90	-6	-7.14%
J-120	76	J-120	84	-8	-10.5%	J-120	75	J-120	82	-7	-9.3%	J-120	73	J-120	80	-7	-9.59%
J-121	75	J-121	83	-8	-10.7%	J-121	74	J-121	81	-7	-9.5%	J-121	72	J-121	79	-7	-9.72%
J-122	82	J-122	90	-8	-9.8%	J-122	81	J-122	88	-7	-8.6%	J-122	79	J-122	85	-6	-7.59%
J-123	81	J-123	89	-8	-9.9%	J-123	80	J-123	87	-7	-8.8%	J-123	78	J-123	84	-6	-7.69%
J-124	94	J-124	103	-9	-9.6%	J-124	93	J-124	101	-8	-8.6%	J-124	92	J-124	98	-6	-6.52%
J-125	94	J-125	102	-8	-8.5%	J-125	93	J-125	100	-7	-7.5%	J-125	91	J-125	98	-7	-7.69%
J-126	88	J-126	87	1	1.1%	J-126	87	J-126	85	2	2.3%	J-126	86	J-126	82	4	4.65%
J-127	88	J-127	87	1	1.1%	J-127	87	J-127	85	2	2.3%	J-127	86	J-127	82	4	4.65%
J-13	92	J-13	100	-8	-8.7%	J-13	91	J-13	98	-7	-7.7%	J-13	89	J-13	96	-7	-7.87%
J-130	38	J-130	65	-27	-71.1%	J-130	37	J-130	59	-22	-59.5%	J-130	36	J-130	53	-17	-47.22%
J-131	37	J-131	64	-27	-73.0%	J-131	36	J-131	59	-23	-63.9%	J-131	36	J-131	53	-17	-47.22%
J-132	76	J-132	84	-8	-10.5%	J-132	75	J-132	82	-7	-9.3%	J-132	73	J-132	80	-7	-9.59%
J-133	75	J-133	84	-9	-12.0%	J-133	74	J-133	81	-7	-9.5%	J-133	72	J-133	79	-7	-9.72%
J-134	105	J-134	104	1	1.0%	J-134	105	J-134	101	4	3.8%	J-134	104	J-134	98	6	5.77%
J-135	106	J-135	105	1	0.9%	J-135	105	J-135	102	3	2.9%	J-135	104	J-135	98	6	5.77%
J-138	78	J-138	84	-6	-7.7%	J-138	74	J-138	78	-4	-5.4%	J-138	72	J-138	70	2	2.78%
J-139	78	J-139	84	-6	-7.7%	J-139	75	J-139	78	-3	-4.0%	J-139	73	J-139	70	3	4.11%
J-14	92	J-14	101	-9	-9.8%	J-14	91	J-14	99	-8	-8.8%	J-14	90	J-14	96	-6	-6.67%
J-142	65	J-142	73	-8	-12.3%	J-142	64	J-142	71	-7	-10.9%	J-142	62	J-142	68	-6	-9.68%
J-143	66	J-143	74	-8	-12.1%	J-143	65	J-143	72	-7	-10.8%	J-143	63	J-143	70	-7	-11.11%
J-144	72	J-144	72	0	0.0%	J-144	72	J-144	71	1	1.4%	J-144	71	J-144	70	1	1.41%
J-145	72	J-145	72	0	0.0%	J-145	72	J-145	70	2	2.8%	J-145	71	J-145	69	2	2.82%
J-148	73	J-148	81	-8	-11.0%	J-148	71	J-148	79	-8	-11.3%	J-148	70	J-148	76	-6	-8.57%
J-149	74	J-149	83	-9	-12.2%	J-149	73	J-149	80	-7	-9.6%	J-149	71	J-149	78	-7	-9.86%
J-150	83	J-150	92	-9	-10.8%	J-150	82	J-150	89	-7	-8.5%	J-150	80	J-150	87	-7	-8.75%
J-151	86	J-151	95	-9	-10.5%	J-151	86	J-151	93	-7	-8.1%	J-151	84	J-151	90	-6	-7.14%
J-152	86	J-152	94	-8	-9.3%	J-152	85	J-152	92	-7	-8.2%	J-152	83	J-152	90	-7	-8.43%
J-153	72	J-153	71	1	1.4%	J-153	71	J-153	69	2	2.8%	J-153	70	J-153	66	4	5.71%
J-154	69	J-154	69	0	0.0%	J-154	68	J-154	66	2	2.9%	J-154	68	J-154	64	4	5.88%
J-155	96	J-155	103	-7	-7.3%	J-155	92	J-155	98	-6	-6.5%	J-155	90	J-155	91	-1	-1.11%

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																	
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-156	95	J-156	102	-7	-7.4%	J-156	92	J-156	97	-5	-5.4%	J-156	90	J-156	91	-1	-1.11%
J-157	104	J-157	110	-6	-5.8%	J-157	101	J-157	104	-3	-3.0%	J-157	99	J-157	96	3	3.03%
J-158	104	J-158	110	-6	-5.8%	J-158	100	J-158	104	-4	-4.0%	J-158	98	J-158	96	2	2.04%
J-159	95	J-159	94	1	1.1%	J-159	94	J-159	92	2	2.1%	J-159	94	J-159	90	4	4.26%
J-160	94	J-160	94	0	0.0%	J-160	93	J-160	91	2	2.2%	J-160	93	J-160	89	4	4.30%
J-161	56	J-161	55	1	1.8%	J-161	55	J-161	53	2	3.6%	J-161	54	J-161	51	3	5.56%
J-162	58	J-162	57	1	1.7%	J-162	57	J-162	54	3	5.3%	J-162	56	J-162	52	4	7.14%
J-163	83	J-163	83	0	0.0%	J-163	83	J-163	81	2	2.4%	J-163	82	J-163	78	4	4.88%
J-164	83	J-164	82	1	1.2%	J-164	82	J-164	80	2	2.4%	J-164	81	J-164	78	3	3.70%
J-165	83	J-165	89	-6	-7.2%	J-165	79	J-165	83	-4	-5.1%	J-165	77	J-165	76	1	1.30%
J-166	82	J-166	88	-6	-7.3%	J-166	78	J-166	83	-5	-6.4%	J-166	76	J-166	75	1	1.32%
J-167	63	J-167	63	0	0.0%	J-167	63	J-167	61	2	3.2%	J-167	62	J-167	59	3	4.84%
J-169	63	J-169	62	1	1.6%	J-169	62	J-169	61	1	1.6%	J-169	62	J-169	59	3	4.84%
J-170	63	J-170	62	1	1.6%	J-170	62	J-170	60	2	3.2%	J-170	62	J-170	58	4	6.45%
J-171	93	J-171	101	-8	-8.6%	J-171	91	J-171	99	-8	-8.8%	J-171	90	J-171	96	-6	-6.67%
J-172	93	J-172	102	-9	-9.7%	J-172	92	J-172	100	-8	-8.7%	J-172	90	J-172	97	-7	-7.78%
J-173	91	J-173	90	1	1.1%	J-173	90	J-173	87	3	3.3%	J-173	90	J-173	83	7	7.78%
J-174	61	J-174	68	-7	-11.5%	J-174	58	J-174	64	-6	-10.3%	J-174	56	J-174	60	-4	-7.14%
J-175	62	J-175	69	-7	-11.3%	J-175	58	J-175	65	-7	-12.1%	J-175	57	J-175	61	-4	-7.02%
J-176	66	J-176	74	-8	-12.1%	J-176	65	J-176	72	-7	-10.8%	J-176	63	J-176	70	-7	-11.11%
J-177	64	J-177	73	-9	-14.1%	J-177	64	J-177	70	-6	-9.4%	J-177	61	J-177	68	-7	-11.48%
J-178	80	J-178	88	-8	-10.0%	J-178	77	J-178	84	-7	-9.1%	J-178	76	J-178	79	-3	-3.95%
J-179	83	J-179	91	-8	-9.6%	J-179	80	J-179	87	-7	-8.8%	J-179	78	J-179	82	-4	-5.13%
J-180	63	J-180	63	0	0.0%	J-180	63	J-180	61	2	3.2%	J-180	62	J-180	59	3	4.84%
J-181	77	J-181	83	-6	-7.8%	J-181	73	J-181	78	-5	-6.8%	J-181	71	J-181	70	1	1.41%
J-182	78	J-182	84	-6	-7.7%	J-182	74	J-182	79	-5	-6.8%	J-182	72	J-182	71	1	1.39%
J-183	51	J-183	50	1	2.0%	J-183	50	J-183	49	1	2.0%	J-183	50	J-183	47	3	6.00%
J-184	55	J-184	55	0	0.0%	J-184	55	J-184	53	2	3.6%	J-184	55	J-184	52	3	5.45%
J-185	101	J-185	99	2	2.0%	J-185	100	J-185	97	3	3.0%	J-185	99	J-185	94	5	5.05%
J-186	101	J-186	100	1	1.0%	J-186	100	J-186	97	3	3.0%	J-186	100	J-186	94	6	6.00%
J-187	74	J-187	74	0	0.0%	J-187	74	J-187	72	2	2.7%	J-187	73	J-187	70	3	4.11%
J-188	75	J-188	75	0	0.0%	J-188	75	J-188	73	2	2.7%	J-188	74	J-188	71	3	4.05%
J-189	23	J-189	23	0	0.0%	J-189	23	J-189	23	0	0.0%	J-189	23	J-189	23	0	0.00%
J-19	62	J-19	71	-9	-14.5%	J-19	62	J-19	69	-7	-11.3%	J-19	60	J-19	66	-6	-10.00%
J-191	84	J-191	93	-9	-10.7%	J-191	83	J-191	91	-8	-9.6%	J-191	82	J-191	88	-6	-7.32%
J-192	83	J-192	92	-9	-10.8%	J-192	82	J-192	90	-8	-9.8%	J-192	81	J-192	87	-6	-7.41%
J-193	93	J-193	99	-6	-6.5%	J-193	89	J-193	93	-4	-4.5%	J-193	87	J-193	84	3	3.45%
J-194	95	J-194	101	-6	-6.3%	J-194	91	J-194	94	-3	-3.3%	J-194	89	J-194	86	3	3.37%
J-195	72	J-195	71	1	1.4%	J-195	71	J-195	69	2	2.8%	J-195	71	J-195	67	4	5.63%
J-196	72	J-196	71	1	1.4%	J-196	71	J-196	69	2	2.8%	J-196	70	J-196	67	3	4.29%
J-197	92	J-197	99	-7	-7.6%	J-197	88	J-197	94	-6	-6.8%	J-197	86	J-197	87	-1	-1.16%
J-198	91	J-198	98	-7	-7.7%	J-198	87	J-198	93	-6	-6.9%	J-198	85	J-198	87	-2	-2.35%
J-199	36	J-199	63	-27	-75.0%	J-199	35	J-199	58	-23	-65.7%	J-199	35	J-199	52	-17	-48.57%
J-2	91	J-2	99	-8	-8.8%	J-2	89	J-2	97	-8	-9.0%	J-2	88	J-2	94	-6	-6.82%
J-20	62	J-20	71	-9	-14.5%	J-20	62	J-20	69	-7	-11.3%	J-20	60	J-20	66	-6	-10.00%
J-200	36	J-200	63	-27	-75.0%	J-200	35	J-200	57	-22	-62.9%	J-200	34	J-200	52	-18	-52.94%
J-201	93	J-201	100	-7	-7.5%	J-201	89	J-201	95	-6	-6.7%	J-201	87	J-201	88	-1	-1.15%
J-202	93	J-202	100	-7	-7.5%	J-202	90	J-202	95	-5	-5.6%	J-202	88	J-202	89	-1	-1.14%

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-203	101	J-203	100	1	1.0%	J-203	100	J-203	98	2	2.0%	J-203	99	J-203	96	3	3.03%
J-204	100	J-204	100	0	0.0%	J-204	100	J-204	97	3	3.0%	J-204	99	J-204	95	4	4.04%
J-205	49	J-205	56	-7	-14.3%	J-205	46	J-205	50	-4	-8.7%	J-205	44	J-205	43	1	2.27%
J-206	49	J-206	55	-6	-12.2%	J-206	45	J-206	50	-5	-11.1%	J-206	43	J-206	43	0	0.00%
J-207	98	J-207	97	1	1.0%	J-207	97	J-207	95	2	2.1%	J-207	96	J-207	92	4	4.17%
J-208	98	J-208	98	0	0.0%	J-208	98	J-208	95	3	3.1%	J-208	97	J-208	93	4	4.12%
J-209	89	J-209	88	1	1.1%	J-209	88	J-209	86	2	2.3%	J-209	87	J-209	83	4	4.60%
J-21	79	J-21	87	-8	-10.1%	J-21	78	J-21	85	-7	-9.0%	J-21	76	J-21	82	-6	-7.89%
J-210	88	J-210	88	0	0.0%	J-210	87	J-210	85	2	2.3%	J-210	87	J-210	83	4	4.60%
J-211	87	J-211	87	0	0.0%	J-211	86	J-211	84	2	2.3%	J-211	86	J-211	82	4	4.65%
J-212	88	J-212	87	1	1.1%	J-212	87	J-212	85	2	2.3%	J-212	86	J-212	82	4	4.65%
J-213	92	J-213	100	-8	-8.7%	J-213	91	J-213	98	-7	-7.7%	J-213	89	J-213	96	-7	-7.87%
J-214	90	J-214	99	-9	-10.0%	J-214	89	J-214	97	-8	-9.0%	J-214	87	J-214	95	-8	-9.20%
J-215	92	J-215	100	-8	-8.7%	J-215	91	J-215	98	-7	-7.7%	J-215	89	J-215	96	-7	-7.87%
J-216	91	J-216	100	-9	-9.9%	J-216	90	J-216	98	-8	-8.9%	J-216	88	J-216	96	-8	-9.09%
J-217	77	J-217	76	1	1.3%	J-217	76	J-217	74	2	2.6%	J-217	75	J-217	72	3	4.00%
J-218	79	J-218	78	1	1.3%	J-218	78	J-218	76	2	2.6%	J-218	77	J-218	73	4	5.19%
J-22	79	J-22	87	-8	-10.1%	J-22	78	J-22	85	-7	-9.0%	J-22	76	J-22	82	-6	-7.89%
J-221	84	J-221	92	-8	-9.5%	J-221	80	J-221	87	-7	-8.8%	J-221	78	J-221	82	-4	-5.13%
J-222	54	J-222	53	1	1.9%	J-222	53	J-222	50	3	5.7%	J-222	52	J-222	48	4	7.69%
J-223	58	J-223	57	1	1.7%	J-223	57	J-223	54	3	5.3%	J-223	56	J-223	52	4	7.14%
J-224	118	J-224	127	-9	-7.6%	J-224	117	J-224	125	-8	-6.8%	J-224	116	J-224	123	-7	-6.03%
J-225	120	J-225	129	-9	-7.5%	J-225	119	J-225	127	-8	-6.7%	J-225	118	J-225	125	-7	-5.93%
J-226	83	J-226	89	-6	-7.2%	J-226	79	J-226	83	-4	-5.1%	J-226	77	J-226	74	3	3.90%
J-227	85	J-227	91	-6	-7.1%	J-227	82	J-227	85	-3	-3.7%	J-227	80	J-227	77	3	3.75%
J-228	88	J-228	86	2	2.3%	J-228	87	J-228	81	6	6.9%	J-228	86	J-228	76	10	11.63%
J-229	86	J-229	84	2	2.3%	J-229	86	J-229	80	6	7.0%	J-229	85	J-229	75	10	11.76%
J-23	64	J-23	63	1	1.6%	J-23	63	J-23	61	2	3.2%	J-23	63	J-23	59	4	6.35%
J-230	65	J-230	64	1	1.5%	J-230	64	J-230	62	2	3.1%	J-230	64	J-230	61	3	4.69%
J-231	103	J-231	102	1	1.0%	J-231	102	J-231	100	2	2.0%	J-231	102	J-231	98	4	3.92%
J-232	103	J-232	102	1	1.0%	J-232	102	J-232	100	2	2.0%	J-232	102	J-232	98	4	3.92%
J-233	105	J-233	104	1	1.0%	J-233	105	J-233	101	4	3.8%	J-233	104	J-233	98	6	5.77%
J-234	105	J-234	104	1	1.0%	J-234	105	J-234	101	4	3.8%	J-234	104	J-234	98	6	5.77%
J-235	92	J-235	91	1	1.1%	J-235	92	J-235	88	4	4.3%	J-235	91	J-235	85	6	6.59%
J-236	93	J-236	92	1	1.1%	J-236	92	J-236	89	3	3.3%	J-236	92	J-236	86	6	6.52%
J-237	88	J-237	87	1	1.1%	J-237	87	J-237	85	2	2.3%	J-237	86	J-237	82	4	4.65%
J-238	94	J-238	93	1	1.1%	J-238	93	J-238	91	2	2.2%	J-238	92	J-238	88	4	4.35%
J-239	85	J-239	93	-8	-9.4%	J-239	84	J-239	91	-7	-8.3%	J-239	82	J-239	88	-6	-7.32%
J-24	64	J-24	63	1	1.6%	J-24	63	J-24	61	2	3.2%	J-24	63	J-24	59	4	6.35%
J-240	98	J-240	104	-6	-6.1%	J-240	94	J-240	98	-4	-4.3%	J-240	92	J-240	90	2	2.17%
J-245	97	J-245	105	-8	-8.2%	J-245	96	J-245	103	-7	-7.3%	J-245	94	J-245	101	-7	-7.45%
J-246	98	J-246	106	-8	-8.2%	J-246	97	J-246	104	-7	-7.2%	J-246	95	J-246	102	-7	-7.37%
J-247	45	J-247	44	1	2.2%	J-247	44	J-247	43	1	2.3%	J-247	44	J-247	41	3	6.82%
J-248	53	J-248	53	0	0.0%	J-248	53	J-248	51	2	3.8%	J-248	53	J-248	50	3	5.66%
J-249	104	J-249	110	-6	-5.8%	J-249	100	J-249	104	-4	-4.0%	J-249	99	J-249	96	3	3.03%
J-25	87	J-25	96	-9	-10.3%	J-25	87	J-25	93	-6	-6.9%	J-25	84	J-25	91	-7	-8.33%
J-250	32	J-250	41	-9	-28.1%	J-250	30	J-250	40	-10	-33.3%	J-250	29	J-250	40	-11	-37.93%
J-251	30	J-251	39	-9	-30.0%	J-251	29	J-251	39	-10	-34.5%	J-251	28	J-251	38	-10	-35.71%

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-254	87	J-254	94	-7	-8.0%	J-254	83	J-254	90	-7	-8.4%	J-254	81	J-254	84	-3	-3.70%
J-255	96	J-255	95	1	1.0%	J-255	95	J-255	92	3	3.2%	J-255	95	J-255	89	6	6.32%
J-256	93	J-256	91	2	2.2%	J-256	92	J-256	89	3	3.3%	J-256	91	J-256	85	6	6.59%
J-257	87	J-257	87	0	0.0%	J-257	86	J-257	84	2	2.3%	J-257	86	J-257	82	4	4.65%
J-258	88	J-258	87	1	1.1%	J-258	87	J-258	85	2	2.3%	J-258	86	J-258	82	4	4.65%
J-259	88	J-259	87	1	1.1%	J-259	87	J-259	85	2	2.3%	J-259	86	J-259	82	4	4.65%
J-26	87	J-26	95	-8	-9.2%	J-26	86	J-26	93	-7	-8.1%	J-26	84	J-26	91	-7	-8.33%
J-260	88	J-260	87	1	1.1%	J-260	87	J-260	85	2	2.3%	J-260	86	J-260	82	4	4.65%
J-261	62	J-261	62	0	0.0%	J-261	62	J-261	60	2	3.2%	J-261	61	J-261	58	3	4.92%
J-262	63	J-262	62	1	1.6%	J-262	62	J-262	60	2	3.2%	J-262	62	J-262	58	4	6.45%
J-265	86	J-265	95	-9	-10.5%	J-265	86	J-265	93	-7	-8.1%	J-265	84	J-265	90	-6	-7.14%
J-266	80	J-266	79	1	1.3%	J-266	80	J-266	77	3	3.8%	J-266	79	J-266	75	4	5.06%
J-267	80	J-267	79	1	1.3%	J-267	79	J-267	77	2	2.5%	J-267	79	J-267	75	4	5.06%
J-268	46	J-268	55	-9	-19.6%	J-268	45	J-268	54	-9	-20.0%	J-268	44	J-268	53	-9	-20.45%
J-269	49	J-269	58	-9	-18.4%	J-269	49	J-269	57	-8	-16.3%	J-269	47	J-269	56	-9	-19.15%
J-27	79	J-27	78	1	1.3%	J-27	79	J-27	76	3	3.8%	J-27	78	J-27	74	4	5.13%
J-270	93	J-270	101	-8	-8.6%	J-270	91	J-270	99	-8	-8.8%	J-270	90	J-270	96	-6	-6.67%
J-271	92	J-271	100	-8	-8.7%	J-271	91	J-271	98	-7	-7.7%	J-271	89	J-271	96	-7	-7.87%
J-272	92	J-272	101	-9	-9.8%	J-272	91	J-272	98	-7	-7.7%	J-272	89	J-272	96	-7	-7.87%
J-273	88	J-273	87	1	1.1%	J-273	87	J-273	84	3	3.4%	J-273	87	J-273	81	6	6.90%
J-274	85	J-274	84	1	1.2%	J-274	84	J-274	81	3	3.6%	J-274	83	J-274	77	6	7.23%
J-275	78	J-275	86	-8	-10.3%	J-275	77	J-275	84	-7	-9.1%	J-275	75	J-275	81	-6	-8.00%
J-276	75	J-276	74	1	1.3%	J-276	74	J-276	72	2	2.7%	J-276	73	J-276	69	4	5.48%
J-277	83	J-277	89	-6	-7.2%	J-277	79	J-277	84	-5	-6.3%	J-277	77	J-277	78	-1	-1.30%
J-278	80	J-278	86	-6	-7.5%	J-278	76	J-278	81	-5	-6.6%	J-278	74	J-278	75	-1	-1.35%
J-279	86	J-279	85	1	1.2%	J-279	85	J-279	82	3	3.5%	J-279	84	J-279	80	4	4.76%
J-28	79	J-28	78	1	1.3%	J-28	79	J-28	76	3	3.8%	J-28	78	J-28	74	4	5.13%
J-280	86	J-280	85	1	1.2%	J-280	85	J-280	83	2	2.4%	J-280	84	J-280	80	4	4.76%
J-281	88	J-281	87	1	1.1%	J-281	87	J-281	85	2	2.3%	J-281	86	J-281	82	4	4.65%
J-282	87	J-282	86	1	1.1%	J-282	86	J-282	84	2	2.3%	J-282	86	J-282	82	4	4.65%
J-283	91	J-283	89	2	2.2%	J-283	90	J-283	85	5	5.6%	J-283	90	J-283	79	11	12.22%
J-284	91	J-284	88	3	3.3%	J-284	90	J-284	84	6	6.7%	J-284	89	J-284	79	10	11.24%
J-285	87	J-285	94	-7	-8.0%	J-285	83	J-285	90	-7	-8.4%	J-285	81	J-285	84	-3	-3.70%
J-286	87	J-286	94	-7	-8.0%	J-286	83	J-286	89	-6	-7.2%	J-286	81	J-286	84	-3	-3.70%
J-287	59	J-287	58	1	1.7%	J-287	58	J-287	56	2	3.4%	J-287	57	J-287	53	4	7.02%
J-288	64	J-288	63	1	1.6%	J-288	63	J-288	61	2	3.2%	J-288	62	J-288	58	4	6.45%
J-289	101	J-289	99	2	2.0%	J-289	100	J-289	97	3	3.0%	J-289	99	J-289	94	5	5.05%
J-29	102	J-29	101	1	1.0%	J-29	102	J-29	99	3	2.9%	J-29	101	J-29	96	5	4.95%
J-290	100	J-290	99	1	1.0%	J-290	99	J-290	96	3	3.0%	J-290	99	J-290	93	6	6.06%
J-291	72	J-291	79	-7	-9.7%	J-291	69	J-291	75	-6	-8.7%	J-291	67	J-291	70	-3	-4.48%
J-292	73	J-292	80	-7	-9.6%	J-292	70	J-292	77	-7	-10.0%	J-292	69	J-292	72	-3	-4.35%
J-293	90	J-293	96	-6	-6.7%	J-293	86	J-293	91	-5	-5.8%	J-293	84	J-293	84	0	0.00%
J-294	93	J-294	100	-7	-7.5%	J-294	89	J-294	95	-6	-6.7%	J-294	87	J-294	88	-1	-1.15%
J-295	80	J-295	79	1	1.3%	J-295	79	J-295	77	2	2.5%	J-295	79	J-295	75	4	5.06%
J-296	80	J-296	79	1	1.3%	J-296	80	J-296	77	3	3.8%	J-296	79	J-296	75	4	5.06%
J-297	58	J-297	57	1	1.7%	J-297	57	J-297	55	2	3.5%	J-297	56	J-297	52	4	7.14%
J-298	57	J-298	56	1	1.8%	J-298	56	J-298	54	2	3.6%	J-298	55	J-298	51	4	7.27%
J-299	95	J-299	104	-9	-9.5%	J-299	94	J-299	101	-7	-7.4%	J-299	92	J-299	99	-7	-7.61%

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																	
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-3	38	J-3	47	-9	-23.7%	J-3	37	J-3	45	-8	-21.6%	J-3	36	J-3	43	-7	-19.44%
J-30	102	J-30	101	1	1.0%	J-30	102	J-30	99	3	2.9%	J-30	101	J-30	96	5	4.95%
J-300	96	J-300	104	-8	-8.3%	J-300	95	J-300	102	-7	-7.4%	J-300	93	J-300	99	-6	-6.45%
J-301	67	J-301	75	-8	-11.9%	J-301	66	J-301	73	-7	-10.6%	J-301	64	J-301	70	-6	-9.38%
J-302	67	J-302	75	-8	-11.9%	J-302	66	J-302	73	-7	-10.6%	J-302	64	J-302	71	-7	-10.94%
J-303	50	J-303	57	-7	-14.0%	J-303	47	J-303	51	-4	-8.5%	J-303	45	J-303	44	1	2.22%
J-305	75	J-305	84	-9	-12.0%	J-305	75	J-305	81	-6	-8.0%	J-305	72	J-305	79	-7	-9.72%
J-306	76	J-306	85	-9	-11.8%	J-306	75	J-306	82	-7	-9.3%	J-306	73	J-306	80	-7	-9.59%
J-307	33	J-307	43	-10	-30.3%	J-307	32	J-307	42	-10	-31.3%	J-307	31	J-307	42	-11	-35.48%
J-308	33	J-308	42	-9	-27.3%	J-308	31	J-308	42	-11	-35.5%	J-308	30	J-308	41	-11	-36.67%
J-309	92	J-309	101	-9	-9.8%	J-309	91	J-309	98	-7	-7.7%	J-309	89	J-309	96	-7	-7.87%
J-31	84	J-31	91	-7	-8.3%	J-31	80	J-31	87	-7	-8.8%	J-31	78	J-31	81	-3	-3.85%
J-310	94	J-310	102	-8	-8.5%	J-310	93	J-310	100	-7	-7.5%	J-310	91	J-310	97	-6	-6.59%
J-315	89	J-315	97	-8	-9.0%	J-315	87	J-315	95	-8	-9.2%	J-315	86	J-315	93	-7	-8.14%
J-316	93	J-316	101	-8	-8.6%	J-316	91	J-316	99	-8	-8.8%	J-316	90	J-316	97	-7	-7.78%
J-317	62	J-317	62	0	0.0%	J-317	62	J-317	60	2	3.2%	J-317	61	J-317	58	3	4.92%
J-318	64	J-318	63	1	1.6%	J-318	63	J-318	61	2	3.2%	J-318	63	J-318	59	4	6.35%
J-319	92	J-319	90	2	2.2%	J-319	91	J-319	88	3	3.3%	J-319	90	J-319	84	6	6.67%
J-32	84	J-32	91	-7	-8.3%	J-32	80	J-32	87	-7	-8.8%	J-32	78	J-32	81	-3	-3.85%
J-320	89	J-320	87	2	2.2%	J-320	88	J-320	85	3	3.4%	J-320	87	J-320	82	5	5.75%
J-321	102	J-321	100	2	2.0%	J-321	101	J-321	98	3	3.0%	J-321	100	J-321	95	5	5.00%
J-322	100	J-322	99	1	1.0%	J-322	100	J-322	97	3	3.0%	J-322	99	J-322	94	5	5.05%
J-323	76	J-323	85	-9	-11.8%	J-323	75	J-323	82	-7	-9.3%	J-323	73	J-323	80	-7	-9.59%
J-324	74	J-324	83	-9	-12.2%	J-324	74	J-324	80	-6	-8.1%	J-324	71	J-324	78	-7	-9.86%
J-325	95	J-325	94	1	1.1%	J-325	94	J-325	92	2	2.1%	J-325	93	J-325	90	3	3.23%
J-326	96	J-326	95	1	1.0%	J-326	95	J-326	93	2	2.1%	J-326	94	J-326	91	3	3.19%
J-327	89	J-327	96	-7	-7.9%	J-327	86	J-327	92	-6	-7.0%	J-327	84	J-327	87	-3	-3.57%
J-328	88	J-328	96	-8	-9.1%	J-328	86	J-328	92	-6	-7.0%	J-328	84	J-328	87	-3	-3.57%
J-329	95	J-329	103	-8	-8.4%	J-329	94	J-329	101	-7	-7.4%	J-329	92	J-329	99	-7	-7.61%
J-33	86	J-33	94	-8	-9.3%	J-33	82	J-33	89	-7	-8.5%	J-33	80	J-33	84	-4	-5.00%
J-330	71	J-330	77	-6	-8.5%	J-330	67	J-330	73	-6	-9.0%	J-330	65	J-330	67	-2	-3.08%
J-331	72	J-331	79	-7	-9.7%	J-331	68	J-331	74	-6	-8.8%	J-331	67	J-331	68	-1	-1.49%
J-332	86	J-332	93	-7	-8.1%	J-332	83	J-332	89	-6	-7.2%	J-332	81	J-332	84	-3	-3.70%
J-333	78	J-333	86	-8	-10.3%	J-333	75	J-333	82	-7	-9.3%	J-333	73	J-333	77	-4	-5.48%
J-334	68	J-334	77	-9	-13.2%	J-334	67	J-334	74	-7	-10.4%	J-334	65	J-334	72	-7	-10.77%
J-335	93	J-335	92	1	1.1%	J-335	92	J-335	89	3	3.3%	J-335	91	J-335	86	5	5.49%
J-336	83	J-336	92	-9	-10.8%	J-336	82	J-336	90	-8	-9.8%	J-336	81	J-336	88	-7	-8.64%
J-337	85	J-337	94	-9	-10.6%	J-337	84	J-337	92	-8	-9.5%	J-337	83	J-337	89	-6	-7.23%
J-338	79	J-338	78	1	1.3%	J-338	79	J-338	76	3	3.8%	J-338	78	J-338	74	4	5.13%
J-339	80	J-339	79	1	1.3%	J-339	79	J-339	77	2	2.5%	J-339	79	J-339	74	5	6.33%
J-34	86	J-34	94	-8	-9.3%	J-34	82	J-34	89	-7	-8.5%	J-34	80	J-34	84	-4	-5.00%
J-340	97	J-340	106	-9	-9.3%	J-340	96	J-340	103	-7	-7.3%	J-340	94	J-340	101	-7	-7.45%
J-341	96	J-341	105	-9	-9.4%	J-341	95	J-341	103	-8	-8.4%	J-341	93	J-341	100	-7	-7.53%
J-342	36	J-342	35	1	2.8%	J-342	35	J-342	33	2	5.7%	J-342	34	J-342	31	3	8.82%
J-343	33	J-343	32	1	3.0%	J-343	32	J-343	30	2	6.3%	J-343	31	J-343	28	3	9.68%
J-344	92	J-344	101	-9	-9.8%	J-344	91	J-344	99	-8	-8.8%	J-344	90	J-344	97	-7	-7.78%
J-345	92	J-345	100	-8	-8.7%	J-345	91	J-345	98	-7	-7.7%	J-345	89	J-345	96	-7	-7.87%
J-346	30	J-346	29	1	3.3%	J-346	29	J-346	27	2	6.9%	J-346	29	J-346	25	4	13.79%

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																	
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-348	109	J-348	108	1	0.9%	J-348	108	J-348	105	3	2.8%	J-348	108	J-348	102	6	5.56%
J-349	84	J-349	90	-6	-7.1%	J-349	80	J-349	86	-6	-7.5%	J-349	78	J-349	79	-1	-1.28%
J-35	86	J-35	95	-9	-10.5%	J-35	86	J-35	93	-7	-8.1%	J-35	84	J-35	90	-6	-7.14%
J-350	96	J-350	105	-9	-9.4%	J-350	95	J-350	103	-8	-8.4%	J-350	93	J-350	100	-7	-7.53%
J-351	95	J-351	103	-8	-8.4%	J-351	93	J-351	101	-8	-8.6%	J-351	92	J-351	98	-6	-6.52%
J-352	74	J-352	82	-8	-10.8%	J-352	73	J-352	80	-7	-9.6%	J-352	71	J-352	77	-6	-8.45%
J-353	73	J-353	82	-9	-12.3%	J-353	72	J-353	79	-7	-9.7%	J-353	70	J-353	77	-7	-10.00%
J-354	68	J-354	76	-8	-11.8%	J-354	67	J-354	74	-7	-10.4%	J-354	65	J-354	71	-6	-9.23%
J-355	74	J-355	73	1	1.4%	J-355	73	J-355	71	2	2.7%	J-355	73	J-355	69	4	5.48%
J-356	74	J-356	73	1	1.4%	J-356	73	J-356	71	2	2.7%	J-356	73	J-356	69	4	5.48%
J-357	92	J-357	100	-8	-8.7%	J-357	91	J-357	98	-7	-7.7%	J-357	89	J-357	96	-7	-7.87%
J-358	95	J-358	103	-8	-8.4%	J-358	93	J-358	101	-8	-8.6%	J-358	92	J-358	98	-6	-6.52%
J-359	76	J-359	85	-9	-11.8%	J-359	76	J-359	83	-7	-9.2%	J-359	74	J-359	80	-6	-8.11%
J-36	86	J-36	95	-9	-10.5%	J-36	86	J-36	92	-6	-7.0%	J-36	83	J-36	90	-7	-8.43%
J-360	79	J-360	87	-8	-10.1%	J-360	78	J-360	85	-7	-9.0%	J-360	76	J-360	82	-6	-7.89%
J-361	66	J-361	64	2	3.0%	J-361	65	J-361	60	5	7.7%	J-361	64	J-361	55	9	14.06%
J-362	61	J-362	59	2	3.3%	J-362	60	J-362	55	5	8.3%	J-362	60	J-362	50	10	16.67%
J-363	100	J-363	106	-6	-6.0%	J-363	96	J-363	99	-3	-3.1%	J-363	94	J-363	90	4	4.26%
J-364	100	J-364	106	-6	-6.0%	J-364	97	J-364	100	-3	-3.1%	J-364	95	J-364	91	4	4.21%
J-365	64	J-365	73	-9	-14.1%	J-365	64	J-365	71	-7	-10.9%	J-365	62	J-365	68	-6	-9.68%
J-366	103	J-366	109	-6	-5.8%	J-366	99	J-366	103	-4	-4.0%	J-366	97	J-366	95	2	2.06%
J-367	89	J-367	98	-9	-10.1%	J-367	89	J-367	96	-7	-7.9%	J-367	87	J-367	93	-6	-6.90%
J-369	105	J-369	111	-6	-5.7%	J-369	102	J-369	105	-3	-2.9%	J-369	100	J-369	97	3	3.00%
J-37	84	J-37	82	2	2.4%	J-37	83	J-37	78	5	6.0%	J-37	82	J-37	73	9	10.98%
J-372	68	J-372	77	-9	-13.2%	J-372	67	J-372	75	-8	-11.9%	J-372	66	J-372	73	-7	-10.61%
J-373	84	J-373	91	-7	-8.3%	J-373	81	J-373	86	-5	-6.2%	J-373	79	J-373	80	-1	-1.27%
J-374	84	J-374	91	-7	-8.3%	J-374	81	J-374	86	-5	-6.2%	J-374	79	J-374	80	-1	-1.27%
J-375	83	J-375	89	-6	-7.2%	J-375	79	J-375	83	-4	-5.1%	J-375	77	J-375	75	2	2.60%
J-376	62	J-376	71	-9	-14.5%	J-376	62	J-376	69	-7	-11.3%	J-376	60	J-376	66	-6	-10.00%
J-377	66	J-377	74	-8	-12.1%	J-377	65	J-377	72	-7	-10.8%	J-377	63	J-377	69	-6	-9.52%
J-378	43	J-378	43	0	0.0%	J-378	43	J-378	42	1	2.3%	J-378	43	J-378	40	3	6.98%
J-379	43	J-379	43	0	0.0%	J-379	43	J-379	41	2	4.7%	J-379	43	J-379	40	3	6.98%
J-38	84	J-38	82	2	2.4%	J-38	83	J-38	78	5	6.0%	J-38	82	J-38	73	9	10.98%
J-380	86	J-380	84	2	2.3%	J-380	85	J-380	80	5	5.9%	J-380	84	J-380	75	9	10.71%
J-381	86	J-381	84	2	2.3%	J-381	85	J-381	80	5	5.9%	J-381	85	J-381	75	10	11.76%
J-386	100	J-386	106	-6	-6.0%	J-386	97	J-386	100	-3	-3.1%	J-386	95	J-386	91	4	4.21%
J-387	83	J-387	91	-8	-9.6%	J-387	80	J-387	87	-7	-8.8%	J-387	78	J-387	82	-4	-5.13%
J-388	90	J-388	96	-6	-6.7%	J-388	86	J-388	90	-4	-4.7%	J-388	84	J-388	81	3	3.57%
J-389	94	J-389	100	-6	-6.4%	J-389	90	J-389	94	-4	-4.4%	J-389	88	J-389	85	3	3.41%
J-390	92	J-390	98	-6	-6.5%	J-390	89	J-390	92	-3	-3.4%	J-390	87	J-390	84	3	3.45%
J-391	81	J-391	80	1	1.2%	J-391	80	J-391	77	3	3.8%	J-391	79	J-391	75	4	5.06%
J-392	89	J-392	88	1	1.1%	J-392	88	J-392	85	3	3.4%	J-392	87	J-392	83	4	4.60%
J-393	49	J-393	49	0	0.0%	J-393	49	J-393	47	2	4.1%	J-393	49	J-393	46	3	6.12%
J-394	93	J-394	99	-6	-6.5%	J-394	89	J-394	93	-4	-4.5%	J-394	87	J-394	84	3	3.45%
J-395	86	J-395	95	-9	-10.5%	J-395	85	J-395	93	-8	-9.4%	J-395	83	J-395	90	-7	-8.43%
J-396	83	J-396	92	-9	-10.8%	J-396	82	J-396	90	-8	-9.8%	J-396	80	J-396	87	-7	-8.75%
J-399	74	J-399	73	1	1.4%	J-399	73	J-399	72	1	1.4%	J-399	73	J-399	71	2	2.74%
J-4	38	J-4	47	-9	-23.7%	J-4	37	J-4	45	-8	-21.6%	J-4	36	J-4	43	-7	-19.44%

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-400	74	J-400	73	1	1.4%	J-400	73	J-400	72	1	1.4%	J-400	73	J-400	70	3	4.11%
J-403	84	J-403	93	-9	-10.7%	J-403	83	J-403	91	-8	-9.6%	J-403	82	J-403	89	-7	-8.54%
J-404	81	J-404	90	-9	-11.1%	J-404	80	J-404	88	-8	-10.0%	J-404	79	J-404	86	-7	-8.86%
J-405	59	J-405	58	1	1.7%	J-405	58	J-405	55	3	5.2%	J-405	58	J-405	52	6	10.34%
J-406	57	J-406	56	1	1.8%	J-406	57	J-406	53	4	7.0%	J-406	56	J-406	50	6	10.71%
J-407	80	J-407	89	-9	-11.3%	J-407	80	J-407	87	-7	-8.8%	J-407	78	J-407	84	-6	-7.69%
J-408	68	J-408	77	-9	-13.2%	J-408	68	J-408	74	-6	-8.8%	J-408	65	J-408	72	-7	-10.77%
J-409	70	J-409	79	-9	-12.9%	J-409	69	J-409	76	-7	-10.1%	J-409	67	J-409	74	-7	-10.45%
J-41	33	J-41	32	1	3.0%	J-41	32	J-41	32	0	0.0%	J-41	32	J-41	31	1	3.13%
J-412	66	J-412	75	-9	-13.6%	J-412	65	J-412	73	-8	-12.3%	J-412	64	J-412	71	-7	-10.94%
J-413	57	J-413	66	-9	-15.8%	J-413	56	J-413	64	-8	-14.3%	J-413	54	J-413	61	-7	-12.96%
J-414	82	J-414	91	-9	-11.0%	J-414	81	J-414	89	-8	-9.9%	J-414	80	J-414	87	-7	-8.75%
J-415	97	J-415	103	-6	-6.2%	J-415	94	J-415	97	-3	-3.2%	J-415	92	J-415	88	4	4.35%
J-416	90	J-416	98	-8	-8.9%	J-416	88	J-416	95	-7	-8.0%	J-416	86	J-416	92	-6	-6.98%
J-417	79	J-417	88	-9	-11.4%	J-417	79	J-417	85	-6	-7.6%	J-417	76	J-417	83	-7	-9.21%
J-419	86	J-419	86	0	0.0%	J-419	85	J-419	83	2	2.4%	J-419	85	J-419	81	4	4.71%
J-42	32	J-42	32	0	0.0%	J-42	32	J-42	32	0	0.0%	J-42	32	J-42	31	1	3.13%
J-420	89	J-420	88	1	1.1%	J-420	88	J-420	86	2	2.3%	J-420	87	J-420	84	3	3.45%
J-421	70	J-421	79	-9	-12.9%	J-421	70	J-421	77	-7	-10.0%	J-421	68	J-421	74	-6	-8.82%
J-422	48	J-422	47	1	2.1%	J-422	47	J-422	45	2	4.3%	J-422	46	J-422	42	4	8.70%
J-423	40	J-423	40	0	0.0%	J-423	39	J-423	37	2	5.1%	J-423	39	J-423	35	4	10.26%
J-424	89	J-424	96	-7	-7.9%	J-424	86	J-424	92	-6	-7.0%	J-424	84	J-424	88	-4	-4.76%
J-425	89	J-425	96	-7	-7.9%	J-425	86	J-425	92	-6	-7.0%	J-425	84	J-425	87	-3	-3.57%
J-426	66	J-426	65	1	1.5%	J-426	65	J-426	63	2	3.1%	J-426	65	J-426	61	4	6.15%
J-427	65	J-427	64	1	1.5%	J-427	64	J-427	62	2	3.1%	J-427	64	J-427	60	4	6.25%
J-428	57	J-428	64	-7	-12.3%	J-428	54	J-428	60	-6	-11.1%	J-428	52	J-428	55	-3	-5.77%
J-429	55	J-429	62	-7	-12.7%	J-429	52	J-429	58	-6	-11.5%	J-429	50	J-429	53	-3	-6.00%
J-430	35	J-430	44	-9	-25.7%	J-430	33	J-430	44	-11	-33.3%	J-430	32	J-430	43	-11	-34.38%
J-431	80	J-431	88	-8	-10.0%	J-431	78	J-431	86	-8	-10.3%	J-431	77	J-431	83	-6	-7.79%
J-432	78	J-432	86	-8	-10.3%	J-432	76	J-432	84	-8	-10.5%	J-432	75	J-432	81	-6	-8.00%
J-433	103	J-433	102	1	1.0%	J-433	102	J-433	100	2	2.0%	J-433	101	J-433	98	3	2.97%
J-434	66	J-434	75	-9	-13.6%	J-434	65	J-434	73	-8	-12.3%	J-434	63	J-434	70	-7	-11.11%
J-435	57	J-435	66	-9	-15.8%	J-435	56	J-435	63	-7	-12.5%	J-435	54	J-435	61	-7	-12.96%
J-436	69	J-436	77	-8	-11.6%	J-436	68	J-436	75	-7	-10.3%	J-436	66	J-436	72	-6	-9.09%
J-437	74	J-437	82	-8	-10.8%	J-437	70	J-437	77	-7	-10.0%	J-437	68	J-437	72	-4	-5.88%
J-438	73	J-438	81	-8	-11.0%	J-438	69	J-438	76	-7	-10.1%	J-438	67	J-438	71	-4	-5.97%
J-439	80	J-439	88	-8	-10.0%	J-439	79	J-439	86	-7	-8.9%	J-439	77	J-439	83	-6	-7.79%
J-440	78	J-440	86	-8	-10.3%	J-440	77	J-440	84	-7	-9.1%	J-440	75	J-440	81	-6	-8.00%
J-441	67	J-441	76	-9	-13.4%	J-441	66	J-441	73	-7	-10.6%	J-441	64	J-441	71	-7	-10.94%
J-442	64	J-442	72	-8	-12.5%	J-442	63	J-442	70	-7	-11.1%	J-442	61	J-442	67	-6	-9.84%
J-443	56	J-443	55	1	1.8%	J-443	55	J-443	53	2	3.6%	J-443	54	J-443	50	4	7.41%
J-444	51	J-444	50	1	2.0%	J-444	50	J-444	48	2	4.0%	J-444	50	J-444	46	4	8.00%
J-445	105	J-445	104	1	1.0%	J-445	105	J-445	101	4	3.8%	J-445	104	J-445	98	6	5.77%
J-446	88	J-446	95	-7	-8.0%	J-446	84	J-446	90	-6	-7.1%	J-446	82	J-446	83	-1	-1.22%
J-447	73	J-447	80	-7	-9.6%	J-447	69	J-447	74	-5	-7.2%	J-447	67	J-447	67	0	0.00%
J-448	72	J-448	78	-6	-8.3%	J-448	68	J-448	73	-5	-7.4%	J-448	66	J-448	66	0	0.00%
J-45	94	J-45	100	-6	-6.4%	J-45	90	J-45	94	-4	-4.4%	J-45	88	J-45	85	3	3.41%
J-451	86	J-451	93	-7	-8.1%	J-451	83	J-451	89	-6	-7.2%	J-451	81	J-451	84	-3	-3.70%

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																	
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-452	36	J-452	35	1	2.8%	J-452	35	J-452	33	2	5.7%	J-452	34	J-452	30	4	11.76%
J-455	83	J-455	90	-7	-8.4%	J-455	79	J-455	85	-6	-7.6%	J-455	77	J-455	79	-2	-2.60%
J-456	80	J-456	87	-7	-8.8%	J-456	76	J-456	82	-6	-7.9%	J-456	74	J-456	76	-2	-2.70%
J-457	94	J-457	102	-8	-8.5%	J-457	93	J-457	100	-7	-7.5%	J-457	91	J-457	98	-7	-7.69%
J-458	91	J-458	97	-6	-6.6%	J-458	87	J-458	91	-4	-4.6%	J-458	85	J-458	83	2	2.35%
J-459	91	J-459	97	-6	-6.6%	J-459	87	J-459	91	-4	-4.6%	J-459	85	J-459	83	2	2.35%
J-46	94	J-46	100	-6	-6.4%	J-46	90	J-46	94	-4	-4.4%	J-46	88	J-46	86	2	2.27%
J-460	127	J-460	136	-9	-7.1%	J-460	126	J-460	134	-8	-6.3%	J-460	124	J-460	131	-7	-5.65%
J-461	122	J-461	131	-9	-7.4%	J-461	121	J-461	129	-8	-6.6%	J-461	120	J-461	127	-7	-5.83%
J-462	46	J-462	46	0	0.0%	J-462	46	J-462	44	2	4.3%	J-462	46	J-462	43	3	6.52%
J-463	54	J-463	53	1	1.9%	J-463	53	J-463	52	1	1.9%	J-463	53	J-463	50	3	5.66%
J-464	93	J-464	102	-9	-9.7%	J-464	92	J-464	100	-8	-8.7%	J-464	90	J-464	97	-7	-7.78%
J-465	89	J-465	97	-8	-9.0%	J-465	86	J-465	93	-7	-8.1%	J-465	84	J-465	88	-4	-4.76%
J-466	93	J-466	100	-7	-7.5%	J-466	90	J-466	96	-6	-6.7%	J-466	88	J-466	91	-3	-3.41%
J-467	51	J-467	57	-6	-11.8%	J-467	47	J-467	52	-5	-10.6%	J-467	45	J-467	44	1	2.22%
J-468	91	J-468	99	-8	-8.8%	J-468	89	J-468	97	-8	-9.0%	J-468	88	J-468	94	-6	-6.82%
J-469	94	J-469	100	-6	-6.4%	J-469	90	J-469	94	-4	-4.4%	J-469	88	J-469	85	3	3.41%
J-47	79	J-47	87	-8	-10.1%	J-47	78	J-47	85	-7	-9.0%	J-47	76	J-47	82	-6	-7.89%
J-470	64	J-470	72	-8	-12.5%	J-470	63	J-470	70	-7	-11.1%	J-470	61	J-470	67	-6	-9.84%
J-471	62	J-471	70	-8	-12.9%	J-471	61	J-471	68	-7	-11.5%	J-471	59	J-471	65	-6	-10.17%
J-472	67	J-472	76	-9	-13.4%	J-472	67	J-472	73	-6	-9.0%	J-472	64	J-472	71	-7	-10.94%
J-473	67	J-473	76	-9	-13.4%	J-473	67	J-473	73	-6	-9.0%	J-473	65	J-473	71	-6	-9.23%
J-474	76	J-474	82	-6	-7.9%	J-474	72	J-474	76	-4	-5.6%	J-474	70	J-474	68	2	2.86%
J-475	74	J-475	80	-6	-8.1%	J-475	71	J-475	74	-3	-4.2%	J-475	69	J-475	67	2	2.90%
J-476	88	J-476	97	-9	-10.2%	J-476	88	J-476	94	-6	-6.8%	J-476	85	J-476	92	-7	-8.24%
J-478	35	J-478	62	-27	-77.1%	J-478	35	J-478	57	-22	-62.9%	J-478	34	J-478	51	-17	-50.00%
J-479	62	J-479	61	1	1.6%	J-479	62	J-479	60	2	3.2%	J-479	61	J-479	58	3	4.92%
J-48	79	J-48	87	-8	-10.1%	J-48	78	J-48	85	-7	-9.0%	J-48	76	J-48	82	-6	-7.89%
J-480	64	J-480	73	-9	-14.1%	J-480	64	J-480	71	-7	-10.9%	J-480	62	J-480	68	-6	-9.68%
J-481	62	J-481	61	1	1.6%	J-481	61	J-481	58	3	4.9%	J-481	61	J-481	55	6	9.84%
J-482	57	J-482	56	1	1.8%	J-482	56	J-482	53	3	5.4%	J-482	55	J-482	50	5	9.09%
J-483	60	J-483	87	-27	-45.0%	J-483	59	J-483	82	-23	-39.0%	J-483	59	J-483	76	-17	-28.81%
J-484	66	J-484	93	-27	-40.9%	J-484	65	J-484	87	-22	-33.8%	J-484	64	J-484	82	-18	-28.13%
J-485	94	J-485	103	-9	-9.6%	J-485	93	J-485	100	-7	-7.5%	J-485	91	J-485	98	-7	-7.69%
J-486	89	J-486	98	-9	-10.1%	J-486	88	J-486	95	-7	-8.0%	J-486	86	J-486	93	-7	-8.14%
J-487	80	J-487	89	-9	-11.3%	J-487	79	J-487	87	-8	-10.1%	J-487	77	J-487	85	-8	-10.39%
J-488	73	J-488	82	-9	-12.3%	J-488	72	J-488	79	-7	-9.7%	J-488	70	J-488	77	-7	-10.00%
J-489	81	J-489	90	-9	-11.1%	J-489	80	J-489	87	-7	-8.8%	J-489	78	J-489	85	-7	-8.97%
J-49	101	J-49	100	1	1.0%	J-49	100	J-49	98	2	2.0%	J-49	99	J-49	96	3	3.03%
J-490	64	J-490	72	-8	-12.5%	J-490	63	J-490	70	-7	-11.1%	J-490	61	J-490	67	-6	-9.84%
J-491	63	J-491	71	-8	-12.7%	J-491	62	J-491	69	-7	-11.3%	J-491	60	J-491	66	-6	-10.00%
J-492	22	J-492	22	0	0.0%	J-492	22	J-492	21	1	4.5%	J-492	22	J-492	21	1	4.55%
J-493	63	J-493	69	-6	-9.5%	J-493	59	J-493	64	-5	-8.5%	J-493	57	J-493	56	1	1.75%
J-494	65	J-494	73	-8	-12.3%	J-494	64	J-494	71	-7	-10.9%	J-494	62	J-494	69	-7	-11.29%
J-495	65	J-495	73	-8	-12.3%	J-495	64	J-495	71	-7	-10.9%	J-495	62	J-495	68	-6	-9.68%
J-496	69	J-496	78	-9	-13.0%	J-496	69	J-496	76	-7	-10.1%	J-496	67	J-496	73	-6	-8.96%
J-497	100	J-497	99	1	1.0%	J-497	99	J-497	96	3	3.0%	J-497	99	J-497	93	6	6.06%
J-498	96	J-498	95	1	1.0%	J-498	96	J-498	92	4	4.2%	J-498	95	J-498	89	6	6.32%

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																	
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-499	78	J-499	85	-7	-9.0%	J-499	75	J-499	79	-4	-5.3%	J-499	73	J-499	72	1	1.37%
J-5	87	J-5	95	-8	-9.2%	J-5	84	J-5	91	-7	-8.3%	J-5	82	J-5	86	-4	-4.88%
J-50	101	J-50	100	1	1.0%	J-50	100	J-50	98	2	2.0%	J-50	99	J-50	96	3	3.03%
J-500	75	J-500	74	1	1.3%	J-500	74	J-500	72	2	2.7%	J-500	73	J-500	70	3	4.11%
J-501	74	J-501	74	0	0.0%	J-501	74	J-501	71	3	4.1%	J-501	73	J-501	69	4	5.48%
J-502	79	J-502	77	2	2.5%	J-502	78	J-502	73	5	6.4%	J-502	78	J-502	69	9	11.54%
J-503	81	J-503	79	2	2.5%	J-503	80	J-503	75	5	6.3%	J-503	79	J-503	70	9	11.39%
J-504	95	J-504	104	-9	-9.5%	J-504	94	J-504	101	-7	-7.4%	J-504	92	J-504	99	-7	-7.61%
J-505	92	J-505	100	-8	-8.7%	J-505	90	J-505	98	-8	-8.9%	J-505	89	J-505	95	-6	-6.74%
J-506	38	J-506	47	-9	-23.7%	J-506	36	J-506	46	-10	-27.8%	J-506	35	J-506	46	-11	-31.43%
J-507	95	J-507	104	-9	-9.5%	J-507	94	J-507	101	-7	-7.4%	J-507	92	J-507	99	-7	-7.61%
J-508	94	J-508	103	-9	-9.6%	J-508	93	J-508	100	-7	-7.5%	J-508	91	J-508	98	-7	-7.69%
J-509	98	J-509	97	1	1.0%	J-509	97	J-509	94	3	3.1%	J-509	97	J-509	92	5	5.15%
J-510	97	J-510	96	1	1.0%	J-510	96	J-510	93	3	3.1%	J-510	96	J-510	91	5	5.21%
J-511	58	J-511	57	1	1.7%	J-511	57	J-511	56	1	1.8%	J-511	57	J-511	54	3	5.26%
J-512	82	J-512	91	-9	-11.0%	J-512	82	J-512	88	-6	-7.3%	J-512	79	J-512	86	-7	-8.86%
J-513	45	J-513	54	-9	-20.0%	J-513	43	J-513	54	-11	-25.6%	J-513	42	J-513	53	-11	-26.19%
J-514	80	J-514	88	-8	-10.0%	J-514	79	J-514	86	-7	-8.9%	J-514	77	J-514	83	-6	-7.79%
J-515	122	J-515	131	-9	-7.4%	J-515	121	J-515	129	-8	-6.6%	J-515	120	J-515	127	-7	-5.83%
J-516	122	J-516	131	-9	-7.4%	J-516	121	J-516	128	-7	-5.8%	J-516	119	J-516	126	-7	-5.88%
J-517	65	J-517	73	-8	-12.3%	J-517	64	J-517	71	-7	-10.9%	J-517	62	J-517	69	-7	-11.29%
J-518	79	J-518	85	-6	-7.6%	J-518	75	J-518	80	-5	-6.7%	J-518	73	J-518	72	1	1.37%
J-519	91	J-519	98	-7	-7.7%	J-519	87	J-519	93	-6	-6.9%	J-519	85	J-519	87	-2	-2.35%
J-520	92	J-520	101	-9	-9.8%	J-520	91	J-520	99	-8	-8.8%	J-520	89	J-520	96	-7	-7.87%
J-521	90	J-521	99	-9	-10.0%	J-521	89	J-521	97	-8	-9.0%	J-521	88	J-521	95	-7	-7.95%
J-522	66	J-522	65	1	1.5%	J-522	65	J-522	63	2	3.1%	J-522	65	J-522	61	4	6.15%
J-523	62	J-523	61	1	1.6%	J-523	62	J-523	60	2	3.2%	J-523	61	J-523	58	3	4.92%
J-524	83	J-524	90	-7	-8.4%	J-524	79	J-524	85	-6	-7.6%	J-524	77	J-524	79	-2	-2.60%
J-525	95	J-525	94	1	1.1%	J-525	95	J-525	92	3	3.2%	J-525	94	J-525	89	5	5.32%
J-526	96	J-526	95	1	1.0%	J-526	95	J-526	92	3	3.2%	J-526	94	J-526	90	4	4.26%
J-527	61	J-527	69	-8	-13.1%	J-527	59	J-527	66	-7	-11.9%	J-527	57	J-527	63	-6	-10.53%
J-528	59	J-528	67	-8	-13.6%	J-528	57	J-528	64	-7	-12.3%	J-528	55	J-528	60	-5	-9.09%
J-529	88	J-529	96	-8	-9.1%	J-529	87	J-529	94	-7	-8.0%	J-529	85	J-529	91	-6	-7.06%
J-53	63	J-53	71	-8	-12.7%	J-53	62	J-53	69	-7	-11.3%	J-53	60	J-53	66	-6	-10.00%
J-530	89	J-530	98	-9	-10.1%	J-530	88	J-530	95	-7	-8.0%	J-530	86	J-530	93	-7	-8.14%
J-531	74	J-531	73	1	1.4%	J-531	73	J-531	72	1	1.4%	J-531	73	J-531	70	3	4.11%
J-532	74	J-532	74	0	0.0%	J-532	74	J-532	72	2	2.7%	J-532	73	J-532	71	2	2.74%
J-536	89	J-536	98	-9	-10.1%	J-536	88	J-536	96	-8	-9.1%	J-536	87	J-536	94	-7	-8.05%
J-537	98	J-537	97	1	1.0%	J-537	97	J-537	94	3	3.1%	J-537	97	J-537	92	5	5.15%
J-538	101	J-538	100	1	1.0%	J-538	101	J-538	98	3	3.0%	J-538	100	J-538	95	5	5.00%
J-539	72	J-539	81	-9	-12.5%	J-539	71	J-539	78	-7	-9.9%	J-539	69	J-539	76	-7	-10.14%
J-54	62	J-54	71	-9	-14.5%	J-54	61	J-54	68	-7	-11.5%	J-54	59	J-54	66	-7	-11.86%
J-542	105	J-542	104	1	1.0%	J-542	105	J-542	101	4	3.8%	J-542	104	J-542	98	6	5.77%
J-543	73	J-543	80	-7	-9.6%	J-543	70	J-543	76	-6	-8.6%	J-543	68	J-543	71	-3	-4.41%
J-544	51	J-544	50	1	2.0%	J-544	50	J-544	49	1	2.0%	J-544	50	J-544	47	3	6.00%
J-545	104	J-545	110	-6	-5.8%	J-545	101	J-545	104	-3	-3.0%	J-545	99	J-545	94	5	5.05%
J-546	100	J-546	106	-6	-6.0%	J-546	97	J-546	99	-2	-2.1%	J-546	95	J-546	90	5	5.26%
J-547	104	J-547	109	-5	-4.8%	J-547	100	J-547	103	-3	-3.0%	J-547	98	J-547	94	4	4.08%

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																	
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-548	82	J-548	91	-9	-11.0%	J-548	81	J-548	88	-7	-8.6%	J-548	80	J-548	86	-6	-7.50%
J-551	55	J-551	62	-7	-12.7%	J-551	52	J-551	60	-8	-15.4%	J-551	50	J-551	58	-8	-16.00%
J-552	53	J-552	60	-7	-13.2%	J-552	50	J-552	58	-8	-16.0%	J-552	48	J-552	56	-8	-16.67%
J-553	86	J-553	86	0	0.0%	J-553	86	J-553	83	3	3.5%	J-553	85	J-553	81	4	4.71%
J-554	89	J-554	88	1	1.1%	J-554	88	J-554	86	2	2.3%	J-554	87	J-554	83	4	4.60%
J-555	81	J-555	80	1	1.2%	J-555	80	J-555	78	2	2.5%	J-555	80	J-555	76	4	5.00%
J-556	81	J-556	80	1	1.2%	J-556	80	J-556	78	2	2.5%	J-556	80	J-556	76	4	5.00%
J-557	96	J-557	103	-7	-7.3%	J-557	93	J-557	98	-5	-5.4%	J-557	90	J-557	92	-2	-2.22%
J-558	97	J-558	104	-7	-7.2%	J-558	93	J-558	99	-6	-6.5%	J-558	91	J-558	92	-1	-1.10%
J-559	73	J-559	79	-6	-8.2%	J-559	69	J-559	74	-5	-7.2%	J-559	67	J-559	66	1	1.49%
J-560	84	J-560	91	-7	-8.3%	J-560	81	J-560	85	-4	-4.9%	J-560	79	J-560	78	1	1.27%
J-561	86	J-561	92	-6	-7.0%	J-561	83	J-561	86	-3	-3.6%	J-561	81	J-561	78	3	3.70%
J-564	97	J-564	96	1	1.0%	J-564	96	J-564	93	3	3.1%	J-564	95	J-564	89	6	6.32%
J-565	72	J-565	79	-7	-9.7%	J-565	69	J-565	74	-5	-7.2%	J-565	67	J-565	68	-1	-1.49%
J-566	87	J-566	95	-8	-9.2%	J-566	86	J-566	93	-7	-8.1%	J-566	84	J-566	91	-7	-8.33%
J-567	87	J-567	95	-8	-9.2%	J-567	86	J-567	93	-7	-8.1%	J-567	84	J-567	91	-7	-8.33%
J-568	90	J-568	98	-8	-8.9%	J-568	87	J-568	93	-6	-6.9%	J-568	85	J-568	87	-2	-2.35%
J-569	31	J-569	31	0	0.0%	J-569	31	J-569	31	0	0.0%	J-569	31	J-569	30	1	3.23%
J-570	46	J-570	73	-27	-58.7%	J-570	45	J-570	67	-22	-48.9%	J-570	44	J-570	62	-18	-40.91%
J-571	39	J-571	66	-27	-69.2%	J-571	38	J-571	60	-22	-57.9%	J-571	37	J-571	54	-17	-45.95%
J-572	73	J-572	82	-9	-12.3%	J-572	72	J-572	79	-7	-9.7%	J-572	70	J-572	76	-6	-8.57%
J-573	59	J-573	67	-8	-13.6%	J-573	57	J-573	64	-7	-12.3%	J-573	55	J-573	61	-6	-10.91%
J-574	93	J-574	102	-9	-9.7%	J-574	92	J-574	99	-7	-7.6%	J-574	90	J-574	97	-7	-7.78%
J-575	26	J-575	26	0	0.0%	J-575	26	J-575	26	0	0.0%	J-575	26	J-575	25	1	3.85%
J-576	90	J-576	89	1	1.1%	J-576	89	J-576	87	2	2.2%	J-576	88	J-576	85	3	3.41%
J-577	83	J-577	82	1	1.2%	J-577	82	J-577	80	2	2.4%	J-577	81	J-577	78	3	3.70%
J-578	98	J-578	98	0	0.0%	J-578	98	J-578	95	3	3.1%	J-578	97	J-578	93	4	4.12%
J-579	73	J-579	72	1	1.4%	J-579	72	J-579	71	1	1.4%	J-579	72	J-579	69	3	4.17%
J-580	78	J-580	84	-6	-7.7%	J-580	74	J-580	78	-4	-5.4%	J-580	72	J-580	70	2	2.78%
J-581	85	J-581	91	-6	-7.1%	J-581	81	J-581	85	-4	-4.9%	J-581	79	J-581	77	2	2.53%
J-582	76	J-582	74	2	2.6%	J-582	75	J-582	70	5	6.7%	J-582	74	J-582	65	9	12.16%
J-583	83	J-583	81	2	2.4%	J-583	82	J-583	77	5	6.1%	J-583	81	J-583	72	9	11.11%
J-584	89	J-584	89	0	0.0%	J-584	88	J-584	86	2	2.3%	J-584	88	J-584	84	4	4.55%
J-585	92	J-585	91	1	1.1%	J-585	91	J-585	89	2	2.2%	J-585	90	J-585	87	3	3.33%
J-586	76	J-586	75	1	1.3%	J-586	76	J-586	71	5	6.6%	J-586	75	J-586	67	8	10.67%
J-587	75	J-587	73	2	2.7%	J-587	74	J-587	70	4	5.4%	J-587	73	J-587	65	8	10.96%
J-588	44	J-588	53	-9	-20.5%	J-588	43	J-588	51	-8	-18.6%	J-588	41	J-588	50	-9	-21.95%
J-589	85	J-589	93	-8	-9.4%	J-589	82	J-589	88	-6	-7.3%	J-589	80	J-589	83	-3	-3.75%
J-590	86	J-590	93	-7	-8.1%	J-590	82	J-590	89	-7	-8.5%	J-590	80	J-590	83	-3	-3.75%
J-591	82	J-591	89	-7	-8.5%	J-591	78	J-591	84	-6	-7.7%	J-591	76	J-591	77	-1	-1.32%
J-592	90	J-592	97	-7	-7.8%	J-592	86	J-592	92	-6	-7.0%	J-592	84	J-592	85	-1	-1.19%
J-593	81	J-593	87	-6	-7.4%	J-593	77	J-593	81	-4	-5.2%	J-593	75	J-593	73	2	2.67%
J-594	80	J-594	86	-6	-7.5%	J-594	76	J-594	79	-3	-3.9%	J-594	74	J-594	71	3	4.05%
J-595	86	J-595	93	-7	-8.1%	J-595	82	J-595	89	-7	-8.5%	J-595	80	J-595	83	-3	-3.75%
J-596	69	J-596	68	1	1.4%	J-596	68	J-596	65	3	4.4%	J-596	68	J-596	62	6	8.82%
J-597	63	J-597	72	-9	-14.3%	J-597	62	J-597	69	-7	-11.3%	J-597	60	J-597	67	-7	-11.67%
J-598	86	J-598	85	1	1.2%	J-598	85	J-598	83	2	2.4%	J-598	84	J-598	80	4	4.76%
J-599	68	J-599	77	-9	-13.2%	J-599	68	J-599	74	-6	-8.8%	J-599	66	J-599	72	-6	-9.09%

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-6	87	J-6	95	-8	-9.2%	J-6	84	J-6	91	-7	-8.3%	J-6	82	J-6	86	-4	-4.88%
J-600	87	J-600	95	-8	-9.2%	J-600	86	J-600	93	-7	-8.1%	J-600	84	J-600	90	-6	-7.14%
J-601	81	J-601	89	-8	-9.9%	J-601	80	J-601	87	-7	-8.8%	J-601	78	J-601	84	-6	-7.69%
J-602	90	J-602	89	1	1.1%	J-602	89	J-602	86	3	3.4%	J-602	89	J-602	83	6	6.74%
J-603	79	J-603	78	1	1.3%	J-603	79	J-603	76	3	3.8%	J-603	78	J-603	73	5	6.41%
J-604	67	J-604	75	-8	-11.9%	J-604	66	J-604	73	-7	-10.6%	J-604	64	J-604	71	-7	-10.94%
J-605	67	J-605	66	1	1.5%	J-605	66	J-605	65	1	1.5%	J-605	66	J-605	63	3	4.55%
J-606	85	J-606	93	-8	-9.4%	J-606	83	J-606	91	-8	-9.6%	J-606	82	J-606	88	-6	-7.32%
J-607	95	J-607	103	-8	-8.4%	J-607	94	J-607	101	-7	-7.4%	J-607	92	J-607	99	-7	-7.61%
J-608	93	J-608	99	-6	-6.5%	J-608	89	J-608	93	-4	-4.5%	J-608	87	J-608	85	2	2.30%
J-609	95	J-609	101	-6	-6.3%	J-609	92	J-609	95	-3	-3.3%	J-609	90	J-609	87	3	3.33%
J-610	47	J-610	47	0	0.0%	J-610	47	J-610	47	0	0.0%	J-610	47	J-610	46	1	2.13%
J-611	43	J-611	43	0	0.0%	J-611	43	J-611	42	1	2.3%	J-611	42	J-611	42	0	0.00%
J-612	81	J-612	90	-9	-11.1%	J-612	80	J-612	88	-8	-10.0%	J-612	79	J-612	86	-7	-8.86%
J-613	119	J-613	128	-9	-7.6%	J-613	118	J-613	125	-7	-5.9%	J-613	116	J-613	123	-7	-6.03%
J-614	79	J-614	79	0	0.0%	J-614	79	J-614	77	2	2.5%	J-614	78	J-614	75	3	3.85%
J-615	66	J-615	65	1	1.5%	J-615	65	J-615	63	2	3.1%	J-615	65	J-615	61	4	6.15%
J-616	31	J-616	31	0	0.0%	J-616	31	J-616	31	0	0.0%	J-616	31	J-616	30	1	3.23%
J-617	31	J-617	31	0	0.0%	J-617	31	J-617	30	1	3.2%	J-617	31	J-617	29	2	6.45%
J-618	72	J-618	78	-6	-8.3%	J-618	69	J-618	72	-3	-4.3%	J-618	67	J-618	64	3	4.48%
J-619	83	J-619	92	-9	-10.8%	J-619	82	J-619	89	-7	-8.5%	J-619	80	J-619	87	-7	-8.75%
J-620	88	J-620	97	-9	-10.2%	J-620	87	J-620	94	-7	-8.0%	J-620	85	J-620	92	-7	-8.24%
J-621	86	J-621	85	1	1.2%	J-621	85	J-621	83	2	2.4%	J-621	84	J-621	80	4	4.76%
J-622	78	J-622	78	0	0.0%	J-622	78	J-622	75	3	3.8%	J-622	77	J-622	73	4	5.19%
J-623	81	J-623	90	-9	-11.1%	J-623	81	J-623	87	-6	-7.4%	J-623	78	J-623	85	-7	-8.97%
J-624	86	J-624	94	-8	-9.3%	J-624	85	J-624	92	-7	-8.2%	J-624	83	J-624	89	-6	-7.23%
J-625	74	J-625	73	1	1.4%	J-625	73	J-625	71	2	2.7%	J-625	73	J-625	69	4	5.48%
J-626	85	J-626	84	1	1.2%	J-626	84	J-626	82	2	2.4%	J-626	84	J-626	80	4	4.76%
J-627	70	J-627	78	-8	-11.4%	J-627	69	J-627	76	-7	-10.1%	J-627	67	J-627	74	-7	-10.45%
J-628	49	J-628	48	1	2.0%	J-628	49	J-628	47	2	4.1%	J-628	48	J-628	45	3	6.25%
J-629	50	J-629	50	0	0.0%	J-629	49	J-629	47	2	4.1%	J-629	49	J-629	45	4	8.16%
J-63	92	J-63	90	2	2.2%	J-63	91	J-63	88	3	3.3%	J-63	90	J-63	84	6	6.67%
J-630	55	J-630	61	-6	-10.9%	J-630	51	J-630	56	-5	-9.8%	J-630	49	J-630	48	1	2.04%
J-631	85	J-631	84	1	1.2%	J-631	84	J-631	81	3	3.6%	J-631	83	J-631	79	4	4.82%
J-632	77	J-632	85	-8	-10.4%	J-632	76	J-632	83	-7	-9.2%	J-632	74	J-632	80	-6	-8.11%
J-633	90	J-633	89	1	1.1%	J-633	89	J-633	87	2	2.2%	J-633	89	J-633	85	4	4.49%
J-634	96	J-634	95	1	1.0%	J-634	95	J-634	93	2	2.1%	J-634	95	J-634	91	4	4.21%
J-635	71	J-635	71	0	0.0%	J-635	71	J-635	70	1	1.4%	J-635	70	J-635	68	2	2.86%
J-636	86	J-636	95	-9	-10.5%	J-636	86	J-636	93	-7	-8.1%	J-636	84	J-636	90	-6	-7.14%
J-637	83	J-637	92	-9	-10.8%	J-637	82	J-637	89	-7	-8.5%	J-637	80	J-637	87	-7	-8.75%
J-638	39	J-638	38	1	2.6%	J-638	38	J-638	36	2	5.3%	J-638	37	J-638	33	4	10.81%
J-639	39	J-639	38	1	2.6%	J-639	38	J-639	36	2	5.3%	J-639	37	J-639	33	4	10.81%
J-64	91	J-64	90	1	1.1%	J-64	91	J-64	87	4	4.4%	J-64	90	J-64	84	6	6.67%
J-641	71	J-641	69	2	2.8%	J-641	70	J-641	65	5	7.1%	J-641	69	J-641	60	9	13.04%
J-642	87	J-642	84	3	3.4%	J-642	86	J-642	80	6	7.0%	J-642	85	J-642	75	10	11.76%
J-643	89	J-643	97	-8	-9.0%	J-643	86	J-643	93	-7	-8.1%	J-643	84	J-643	88	-4	-4.76%
J-644	79	J-644	85	-6	-7.6%	J-644	75	J-644	79	-4	-5.3%	J-644	73	J-644	71	2	2.74%
J-645	27	J-645	54	-27	-100.0%	J-645	26	J-645	48	-22	-84.6%	J-645	26	J-645	43	-17	-65.38%

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-646	72	J-646	80	-8	-11.1%	J-646	71	J-646	78	-7	-9.9%	J-646	69	J-646	75	-6	-8.70%
J-647	58	J-647	85	-27	-46.6%	J-647	57	J-647	79	-22	-38.6%	J-647	56	J-647	73	-17	-30.36%
J-648	90	J-648	88	2	2.2%	J-648	89	J-648	84	5	5.6%	J-648	88	J-648	79	9	10.23%
J-649	99	J-649	98	1	1.0%	J-649	99	J-649	95	4	4.0%	J-649	98	J-649	92	6	6.12%
J-65	74	J-65	82	-8	-10.8%	J-65	73	J-65	80	-7	-9.6%	J-65	71	J-65	78	-7	-9.86%
J-650	68	J-650	75	-7	-10.3%	J-650	65	J-650	71	-6	-9.2%	J-650	63	J-650	66	-3	-4.76%
J-651	73	J-651	72	1	1.4%	J-651	72	J-651	71	1	1.4%	J-651	72	J-651	70	2	2.78%
J-652	50	J-652	50	0	0.0%	J-652	50	J-652	48	2	4.0%	J-652	49	J-652	47	2	4.08%
J-653	83	J-653	82	1	1.2%	J-653	83	J-653	80	3	3.6%	J-653	82	J-653	77	5	6.10%
J-654	32	J-654	31	1	3.1%	J-654	31	J-654	29	2	6.5%	J-654	30	J-654	26	4	13.33%
J-655	86	J-655	85	1	1.2%	J-655	85	J-655	83	2	2.4%	J-655	84	J-655	80	4	4.76%
J-656	77	J-656	77	0	0.0%	J-656	77	J-656	74	3	3.9%	J-656	76	J-656	72	4	5.26%
J-657	80	J-657	79	1	1.3%	J-657	79	J-657	77	2	2.5%	J-657	78	J-657	74	4	5.13%
J-658	55	J-658	61	-6	-10.9%	J-658	51	J-658	58	-7	-13.7%	J-658	49	J-658	54	-5	-10.20%
J-659	54	J-659	61	-7	-13.0%	J-659	50	J-659	57	-7	-14.0%	J-659	49	J-659	53	-4	-8.16%
J-66	74	J-66	82	-8	-10.8%	J-66	73	J-66	80	-7	-9.6%	J-66	71	J-66	77	-6	-8.45%
J-660	59	J-660	65	-6	-10.2%	J-660	55	J-660	62	-7	-12.7%	J-660	53	J-660	58	-5	-9.43%
J-661	67	J-661	75	-8	-11.9%	J-661	66	J-661	73	-7	-10.6%	J-661	64	J-661	71	-7	-10.94%
J-662	59	J-662	65	-6	-10.2%	J-662	55	J-662	62	-7	-12.7%	J-662	53	J-662	58	-5	-9.43%
J-663	95	J-663	101	-6	-6.3%	J-663	91	J-663	95	-4	-4.4%	J-663	89	J-663	87	2	2.25%
J-664	102	J-664	108	-6	-5.9%	J-664	99	J-664	102	-3	-3.0%	J-664	97	J-664	95	2	2.06%
J-665	89	J-665	98	-9	-10.1%	J-665	88	J-665	96	-8	-9.1%	J-665	87	J-665	94	-7	-8.05%
J-666	79	J-666	77	2	2.5%	J-666	78	J-666	73	5	6.4%	J-666	77	J-666	68	9	11.69%
J-667	89	J-667	89	0	0.0%	J-667	88	J-667	86	2	2.3%	J-667	88	J-667	84	4	4.55%
J-668	52	J-668	51	1	1.9%	J-668	51	J-668	49	2	3.9%	J-668	51	J-668	46	5	9.80%
J-669	54	J-669	53	1	1.9%	J-669	53	J-669	51	2	3.8%	J-669	52	J-669	48	4	7.69%
J-67	86	J-67	92	-6	-7.0%	J-67	82	J-67	87	-5	-6.1%	J-67	80	J-67	80	0	0.00%
J-670	39	J-670	46	-7	-17.9%	J-670	36	J-670	43	-7	-19.4%	J-670	34	J-670	38	-4	-11.76%
J-671	43	J-671	50	-7	-16.3%	J-671	40	J-671	46	-6	-15.0%	J-671	38	J-671	42	-4	-10.53%
J-674	90	J-674	99	-9	-10.0%	J-674	89	J-674	96	-7	-7.9%	J-674	87	J-674	94	-7	-8.05%
J-675	66	J-675	73	-7	-10.6%	J-675	62	J-675	68	-6	-9.7%	J-675	60	J-675	62	-2	-3.33%
J-676	61	J-676	61	0	0.0%	J-676	61	J-676	60	1	1.6%	J-676	61	J-676	60	1	1.64%
J-677	72	J-677	72	0	0.0%	J-677	72	J-677	71	1	1.4%	J-677	71	J-677	69	2	2.82%
J-678	91	J-678	97	-6	-6.6%	J-678	87	J-678	91	-4	-4.6%	J-678	85	J-678	83	2	2.35%
J-679	83	J-679	90	-7	-8.4%	J-679	79	J-679	84	-5	-6.3%	J-679	77	J-679	77	0	0.00%
J-68	86	J-68	92	-6	-7.0%	J-68	82	J-68	87	-5	-6.1%	J-68	80	J-68	79	1	1.25%
J-680	61	J-680	61	0	0.0%	J-680	61	J-680	59	2	3.3%	J-680	60	J-680	57	3	5.00%
J-681	74	J-681	83	-9	-12.2%	J-681	73	J-681	80	-7	-9.6%	J-681	71	J-681	78	-7	-9.86%
J-682	81	J-682	90	-9	-11.1%	J-682	80	J-682	88	-8	-10.0%	J-682	79	J-682	85	-6	-7.59%
J-683	89	J-683	97	-8	-9.0%	J-683	88	J-683	95	-7	-8.0%	J-683	86	J-683	93	-7	-8.14%
J-684	92	J-684	100	-8	-8.7%	J-684	91	J-684	98	-7	-7.7%	J-684	89	J-684	95	-6	-6.74%
J-685	77	J-685	76	1	1.3%	J-685	77	J-685	75	2	2.6%	J-685	76	J-685	73	3	3.95%
J-686	94	J-686	93	1	1.1%	J-686	94	J-686	90	4	4.3%	J-686	93	J-686	87	6	6.45%
J-687	73	J-687	71	2	2.7%	J-687	72	J-687	67	5	6.9%	J-687	72	J-687	62	10	13.89%
J-688	76	J-688	74	2	2.6%	J-688	75	J-688	70	5	6.7%	J-688	74	J-688	65	9	12.16%
J-689	82	J-689	88	-6	-7.3%	J-689	78	J-689	84	-6	-7.7%	J-689	76	J-689	77	-1	-1.32%
J-690	84	J-690	91	-7	-8.3%	J-690	81	J-690	86	-5	-6.2%	J-690	79	J-690	80	-1	-1.27%
J-691	96	J-691	95	1	1.0%	J-691	95	J-691	93	2	2.1%	J-691	94	J-691	91	3	3.19%

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																	
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-692	96	J-692	96	0	0.0%	J-692	96	J-692	94	2	2.1%	J-692	95	J-692	92	3	3.16%
J-693	53	J-693	52	1	1.9%	J-693	52	J-693	50	2	3.8%	J-693	52	J-693	48	4	7.69%
J-694	38	J-694	38	0	0.0%	J-694	37	J-694	35	2	5.4%	J-694	37	J-694	33	4	10.81%
J-695	79	J-695	77	2	2.5%	J-695	78	J-695	73	5	6.4%	J-695	77	J-695	69	8	10.39%
J-696	101	J-696	101	0	0.0%	J-696	100	J-696	98	2	2.0%	J-696	100	J-696	96	4	4.00%
J-697	93	J-697	93	0	0.0%	J-697	93	J-697	90	3	3.2%	J-697	92	J-697	88	4	4.35%
J-698	86	J-698	85	1	1.2%	J-698	85	J-698	83	2	2.4%	J-698	84	J-698	80	4	4.76%
J-699	86	J-699	95	-9	-10.5%	J-699	85	J-699	92	-7	-8.2%	J-699	83	J-699	90	-7	-8.43%
J-7	83	J-7	91	-8	-9.6%	J-7	80	J-7	86	-6	-7.5%	J-7	78	J-7	81	-3	-3.85%
J-700	93	J-700	101	-8	-8.6%	J-700	92	J-700	99	-7	-7.6%	J-700	90	J-700	97	-7	-7.78%
J-701	84	J-701	83	1	1.2%	J-701	83	J-701	80	3	3.6%	J-701	82	J-701	77	5	6.10%
J-703	71	J-703	77	-6	-8.5%	J-703	67	J-703	72	-5	-7.5%	J-703	65	J-703	65	0	0.00%
J-704	72	J-704	78	-6	-8.3%	J-704	68	J-704	73	-5	-7.4%	J-704	66	J-704	66	0	0.00%
J-705	61	J-705	69	-8	-13.1%	J-705	60	J-705	67	-7	-11.7%	J-705	58	J-705	64	-6	-10.34%
J-706	76	J-706	85	-9	-11.8%	J-706	75	J-706	82	-7	-9.3%	J-706	73	J-706	80	-7	-9.59%
J-707	73	J-707	72	1	1.4%	J-707	72	J-707	70	2	2.8%	J-707	72	J-707	67	5	6.94%
J-708	62	J-708	70	-8	-12.9%	J-708	61	J-708	68	-7	-11.5%	J-708	59	J-708	66	-7	-11.86%
J-709	62	J-709	70	-8	-12.9%	J-709	61	J-709	68	-7	-11.5%	J-709	59	J-709	65	-6	-10.17%
J-710	80	J-710	88	-8	-10.0%	J-710	79	J-710	86	-7	-8.9%	J-710	77	J-710	83	-6	-7.79%
J-711	73	J-711	82	-9	-12.3%	J-711	72	J-711	79	-7	-9.7%	J-711	70	J-711	77	-7	-10.00%
J-712	54	J-712	53	1	1.9%	J-712	53	J-712	51	2	3.8%	J-712	53	J-712	49	4	7.55%
J-713	51	J-713	51	0	0.0%	J-713	51	J-713	49	2	3.9%	J-713	50	J-713	47	3	6.00%
J-714	63	J-714	62	1	1.6%	J-714	63	J-714	61	2	3.2%	J-714	62	J-714	59	3	4.84%
J-715	61	J-715	60	1	1.6%	J-715	61	J-715	59	2	3.3%	J-715	60	J-715	57	3	5.00%
J-716	42	J-716	51	-9	-21.4%	J-716	40	J-716	51	-11	-27.5%	J-716	39	J-716	50	-11	-28.21%
J-717	54	J-717	53	1	1.9%	J-717	53	J-717	51	2	3.8%	J-717	53	J-717	49	4	7.55%
J-718	60	J-718	59	1	1.7%	J-718	59	J-718	57	2	3.4%	J-718	59	J-718	55	4	6.78%
J-719	82	J-719	91	-9	-11.0%	J-719	81	J-719	89	-8	-9.9%	J-719	80	J-719	87	-7	-8.75%
J-72	95	J-72	103	-8	-8.4%	J-72	94	J-72	101	-7	-7.4%	J-72	92	J-72	98	-6	-6.52%
J-720	87	J-720	96	-9	-10.3%	J-720	87	J-720	94	-7	-8.0%	J-720	85	J-720	91	-6	-7.06%
J-721	78	J-721	85	-7	-9.0%	J-721	75	J-721	80	-5	-6.7%	J-721	73	J-721	73	0	0.00%
J-724	89	J-724	98	-9	-10.1%	J-724	89	J-724	96	-7	-7.9%	J-724	87	J-724	93	-6	-6.90%
J-725	101	J-725	100	1	1.0%	J-725	100	J-725	98	2	2.0%	J-725	99	J-725	96	3	3.03%
J-726	101	J-726	101	0	0.0%	J-726	101	J-726	99	2	2.0%	J-726	100	J-726	96	4	4.00%
J-727	99	J-727	99	0	0.0%	J-727	99	J-727	97	2	2.0%	J-727	98	J-727	94	4	4.08%
J-728	67	J-728	76	-9	-13.4%	J-728	67	J-728	73	-6	-9.0%	J-728	64	J-728	71	-7	-10.94%
J-729	73	J-729	82	-9	-12.3%	J-729	73	J-729	79	-6	-8.2%	J-729	72	J-729	77	-5	-6.94%
J-73	95	J-73	103	-8	-8.4%	J-73	94	J-73	101	-7	-7.4%	J-73	92	J-73	98	-6	-6.52%
J-731	114	J-731	123	-9	-7.9%	J-731	113	J-731	121	-8	-7.1%	J-731	112	J-731	119	-7	-6.25%
J-732	113	J-732	122	-9	-8.0%	J-732	112	J-732	120	-8	-7.1%	J-732	110	J-732	118	-8	-7.27%
J-733	74	J-733	73	1	1.4%	J-733	73	J-733	71	2	2.7%	J-733	73	J-733	69	4	5.48%
J-734	59	J-734	67	-8	-13.6%	J-734	57	J-734	64	-7	-12.3%	J-734	55	J-734	60	-5	-9.09%
J-735	46	J-735	54	-8	-17.4%	J-735	44	J-735	51	-7	-15.9%	J-735	42	J-735	47	-5	-11.90%
J-736	68	J-736	75	-7	-10.3%	J-736	65	J-736	71	-6	-9.2%	J-736	63	J-736	66	-3	-4.76%
J-737	82	J-737	88	-6	-7.3%	J-737	79	J-737	83	-4	-5.1%	J-737	77	J-737	75	2	2.60%
J-738	104	J-738	103	1	1.0%	J-738	103	J-738	100	3	2.9%	J-738	103	J-738	97	6	5.83%
J-739	96	J-739	95	1	1.0%	J-739	96	J-739	92	4	4.2%	J-739	95	J-739	89	6	6.32%
J-74	72	J-74	72	0	0.0%	J-74	72	J-74	70	2	2.8%	J-74	71	J-74	69	2	2.82%

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-740	78	J-740	76	2	2.6%	J-740	77	J-740	72	5	6.5%	J-740	77	J-740	68	9	11.69%
J-741	82	J-741	81	1	1.2%	J-741	81	J-741	79	2	2.5%	J-741	80	J-741	76	4	5.00%
J-742	70	J-742	69	1	1.4%	J-742	69	J-742	66	3	4.3%	J-742	68	J-742	64	4	5.88%
J-743	58	J-743	64	-6	-10.3%	J-743	54	J-743	61	-7	-13.0%	J-743	53	J-743	58	-5	-9.43%
J-744	68	J-744	67	1	1.5%	J-744	68	J-744	65	3	4.4%	J-744	67	J-744	61	6	8.96%
J-745	62	J-745	61	1	1.6%	J-745	61	J-745	58	3	4.9%	J-745	60	J-745	55	5	8.33%
J-746	63	J-746	72	-9	-14.3%	J-746	62	J-746	69	-7	-11.3%	J-746	60	J-746	67	-7	-11.67%
J-747	64	J-747	73	-9	-14.1%	J-747	64	J-747	70	-6	-9.4%	J-747	61	J-747	68	-7	-11.48%
J-748	73	J-748	82	-9	-12.3%	J-748	72	J-748	80	-8	-11.1%	J-748	71	J-748	78	-7	-9.86%
J-749	86	J-749	95	-9	-10.5%	J-749	85	J-749	92	-7	-8.2%	J-749	83	J-749	90	-7	-8.43%
J-75	72	J-75	72	0	0.0%	J-75	72	J-75	71	1	1.4%	J-75	72	J-75	70	2	2.78%
J-750	107	J-750	106	1	0.9%	J-750	106	J-750	104	2	1.9%	J-750	105	J-750	101	4	3.81%
J-751	106	J-751	105	1	0.9%	J-751	105	J-751	103	2	1.9%	J-751	104	J-751	100	4	3.85%
J-752	102	J-752	101	1	1.0%	J-752	101	J-752	99	2	2.0%	J-752	100	J-752	96	4	4.00%
J-753	56	J-753	63	-7	-12.5%	J-753	53	J-753	59	-6	-11.3%	J-753	51	J-753	54	-3	-5.88%
J-754	87	J-754	85	2	2.3%	J-754	86	J-754	81	5	5.8%	J-754	85	J-754	76	9	10.59%
J-755	59	J-755	57	2	3.4%	J-755	58	J-755	52	6	10.3%	J-755	57	J-755	47	10	17.54%
J-756	88	J-756	95	-7	-8.0%	J-756	85	J-756	91	-6	-7.1%	J-756	83	J-756	86	-3	-3.61%
J-757	87	J-757	85	2	2.3%	J-757	86	J-757	81	5	5.8%	J-757	85	J-757	76	9	10.59%
J-758	84	J-758	83	1	1.2%	J-758	83	J-758	80	3	3.6%	J-758	82	J-758	78	4	4.88%
J-759	72	J-759	80	-8	-11.1%	J-759	71	J-759	78	-7	-9.9%	J-759	69	J-759	76	-7	-10.14%
J-76	106	J-76	104	2	1.9%	J-76	105	J-76	102	3	2.9%	J-76	104	J-76	98	6	5.77%
J-760	57	J-760	55	2	3.5%	J-760	56	J-760	51	5	8.9%	J-760	56	J-760	46	10	17.86%
J-761	95	J-761	103	-8	-8.4%	J-761	94	J-761	101	-7	-7.4%	J-761	92	J-761	99	-7	-7.61%
J-762	82	J-762	90	-8	-9.8%	J-762	79	J-762	86	-7	-8.9%	J-762	77	J-762	81	-4	-5.19%
J-763	83	J-763	90	-7	-8.4%	J-763	80	J-763	86	-6	-7.5%	J-763	78	J-763	82	-4	-5.13%
J-764	120	J-764	128	-8	-6.7%	J-764	119	J-764	126	-7	-5.9%	J-764	117	J-764	124	-7	-5.98%
J-765	85	J-765	84	1	1.2%	J-765	84	J-765	82	2	2.4%	J-765	84	J-765	79	5	5.95%
J-766	86	J-766	84	2	2.3%	J-766	85	J-766	80	5	5.9%	J-766	85	J-766	75	10	11.76%
J-767	86	J-767	94	-8	-9.3%	J-767	85	J-767	92	-7	-8.2%	J-767	83	J-767	89	-6	-7.23%
J-768	90	J-768	89	1	1.1%	J-768	89	J-768	86	3	3.4%	J-768	88	J-768	84	4	4.55%
J-769	83	J-769	81	2	2.4%	J-769	82	J-769	77	5	6.1%	J-769	81	J-769	72	9	11.11%
J-77	105	J-77	104	1	1.0%	J-77	105	J-77	101	4	3.8%	J-77	104	J-77	98	6	5.77%
J-770	70	J-770	79	-9	-12.9%	J-770	70	J-770	77	-7	-10.0%	J-770	68	J-770	74	-6	-8.82%
J-771	78	J-771	78	0	0.0%	J-771	78	J-771	77	1	1.3%	J-771	78	J-771	75	3	3.85%
J-772	86	J-772	92	-6	-7.0%	J-772	82	J-772	86	-4	-4.9%	J-772	80	J-772	78	2	2.50%
J-773	98	J-773	98	0	0.0%	J-773	97	J-773	95	2	2.1%	J-773	97	J-773	93	4	4.12%
J-774	86	J-774	86	0	0.0%	J-774	85	J-774	83	2	2.4%	J-774	85	J-774	81	4	4.71%
J-775	69	J-775	77	-8	-11.6%	J-775	66	J-775	72	-6	-9.1%	J-775	64	J-775	67	-3	-4.69%
J-776	61	J-776	69	-8	-13.1%	J-776	58	J-776	64	-6	-10.3%	J-776	56	J-776	59	-3	-5.36%
J-777	101	J-777	100	1	1.0%	J-777	101	J-777	98	3	3.0%	J-777	100	J-777	95	5	5.00%
J-778	93	J-778	92	1	1.1%	J-778	93	J-778	89	4	4.3%	J-778	92	J-778	86	6	6.52%
J-779	83	J-779	81	2	2.4%	J-779	82	J-779	77	5	6.1%	J-779	82	J-779	72	10	12.20%
J-78	75	J-78	84	-9	-12.0%	J-78	74	J-78	82	-8	-10.8%	J-78	72	J-78	80	-8	-11.11%
J-780	96	J-780	96	0	0.0%	J-780	95	J-780	93	2	2.1%	J-780	95	J-780	91	4	4.21%
J-781	84	J-781	83	1	1.2%	J-781	83	J-781	80	3	3.6%	J-781	83	J-781	77	6	7.23%
J-782	80	J-782	78	2	2.5%	J-782	79	J-782	74	5	6.3%	J-782	79	J-782	69	10	12.66%
J-783	95	J-783	103	-8	-8.4%	J-783	94	J-783	101	-7	-7.4%	J-783	92	J-783	98	-6	-6.52%

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-784	83	J-784	83	0	0.0%	J-784	83	J-784	81	2	2.4%	J-784	82	J-784	78	4	4.88%
J-785	52	J-785	51	1	1.9%	J-785	51	J-785	48	3	5.9%	J-785	50	J-785	46	4	8.00%
J-786	83	J-786	89	-6	-7.2%	J-786	79	J-786	83	-4	-5.1%	J-786	77	J-786	76	1	1.30%
J-787	80	J-787	80	0	0.0%	J-787	80	J-787	77	3	3.8%	J-787	79	J-787	75	4	5.06%
J-788	69	J-788	69	0	0.0%	J-788	69	J-788	66	3	4.3%	J-788	68	J-788	64	4	5.88%
J-789	68	J-789	75	-7	-10.3%	J-789	65	J-789	72	-7	-10.8%	J-789	63	J-789	67	-4	-6.35%
J-79	75	J-79	84	-9	-12.0%	J-79	74	J-79	82	-8	-10.8%	J-79	72	J-79	80	-8	-11.11%
J-790	97	J-790	105	-8	-8.2%	J-790	96	J-790	103	-7	-7.3%	J-790	94	J-790	100	-6	-6.38%
J-791	57	J-791	55	2	3.5%	J-791	56	J-791	51	5	8.9%	J-791	56	J-791	47	9	16.07%
J-792	43	J-792	50	-7	-16.3%	J-792	40	J-792	46	-6	-15.0%	J-792	38	J-792	42	-4	-10.53%
J-793	80	J-793	88	-8	-10.0%	J-793	79	J-793	86	-7	-8.9%	J-793	77	J-793	84	-7	-9.09%
J-794	71	J-794	70	1	1.4%	J-794	70	J-794	68	2	2.9%	J-794	69	J-794	65	4	5.80%
J-795	70	J-795	69	1	1.4%	J-795	69	J-795	67	2	2.9%	J-795	68	J-795	65	3	4.41%
J-796	74	J-796	80	-6	-8.1%	J-796	70	J-796	74	-4	-5.7%	J-796	68	J-796	67	1	1.47%
J-797	115	J-797	124	-9	-7.8%	J-797	114	J-797	122	-8	-7.0%	J-797	113	J-797	120	-7	-6.19%
J-798	109	J-798	118	-9	-8.3%	J-798	108	J-798	116	-8	-7.4%	J-798	106	J-798	113	-7	-6.60%
J-799	80	J-799	79	1	1.3%	J-799	79	J-799	77	2	2.5%	J-799	79	J-799	75	4	5.06%
J-8	83	J-8	91	-8	-9.6%	J-8	80	J-8	86	-6	-7.5%	J-8	78	J-8	81	-3	-3.85%
J-800	53	J-800	60	-7	-13.2%	J-800	50	J-800	57	-7	-14.0%	J-800	49	J-800	54	-5	-10.20%
J-801	84	J-801	91	-7	-8.3%	J-801	80	J-801	86	-6	-7.5%	J-801	78	J-801	79	-1	-1.28%
J-802	79	J-802	86	-7	-8.9%	J-802	75	J-802	81	-6	-8.0%	J-802	73	J-802	75	-2	-2.74%
J-803	85	J-803	85	0	0.0%	J-803	85	J-803	82	3	3.5%	J-803	84	J-803	80	4	4.76%
J-804	88	J-804	88	0	0.0%	J-804	88	J-804	85	3	3.4%	J-804	87	J-804	83	4	4.60%
J-805	103	J-805	109	-6	-5.8%	J-805	99	J-805	103	-4	-4.0%	J-805	97	J-805	95	2	2.06%
J-806	75	J-806	83	-8	-10.7%	J-806	74	J-806	81	-7	-9.5%	J-806	72	J-806	79	-7	-9.72%
J-807	80	J-807	80	0	0.0%	J-807	80	J-807	78	2	2.5%	J-807	79	J-807	75	4	5.06%
J-808	81	J-808	80	1	1.2%	J-808	80	J-808	78	2	2.5%	J-808	80	J-808	75	5	6.25%
J-809	70	J-809	69	1	1.4%	J-809	69	J-809	66	3	4.3%	J-809	68	J-809	63	5	7.35%
J-810	102	J-810	101	1	1.0%	J-810	101	J-810	99	2	2.0%	J-810	100	J-810	96	4	4.00%
J-811	107	J-811	106	1	0.9%	J-811	106	J-811	103	3	2.8%	J-811	105	J-811	101	4	3.81%
J-812	55	J-812	64	-9	-16.4%	J-812	55	J-812	61	-6	-10.9%	J-812	53	J-812	59	-6	-11.32%
J-813	80	J-813	79	1	1.3%	J-813	80	J-813	76	4	5.0%	J-813	79	J-813	72	7	8.86%
J-814	108	J-814	117	-9	-8.3%	J-814	107	J-814	115	-8	-7.5%	J-814	106	J-814	113	-7	-6.60%
J-815	78	J-815	77	1	1.3%	J-815	77	J-815	75	2	2.6%	J-815	76	J-815	72	4	5.26%
J-816	70	J-816	69	1	1.4%	J-816	69	J-816	67	2	2.9%	J-816	69	J-816	65	4	5.80%
J-817	93	J-817	101	-8	-8.6%	J-817	92	J-817	99	-7	-7.6%	J-817	90	J-817	97	-7	-7.78%
J-818	61	J-818	67	-6	-9.8%	J-818	57	J-818	63	-6	-10.5%	J-818	55	J-818	58	-3	-5.45%
J-819	87	J-819	85	2	2.3%	J-819	86	J-819	80	6	7.0%	J-819	85	J-819	75	10	11.76%
J-82	90	J-82	88	2	2.2%	J-82	89	J-82	85	4	4.5%	J-82	88	J-82	82	6	6.82%
J-820	87	J-820	96	-9	-10.3%	J-820	86	J-820	94	-8	-9.3%	J-820	85	J-820	91	-6	-7.06%
J-821	106	J-821	104	2	1.9%	J-821	105	J-821	101	4	3.8%	J-821	104	J-821	98	6	5.77%
J-822	93	J-822	101	-8	-8.6%	J-822	92	J-822	99	-7	-7.6%	J-822	90	J-822	97	-7	-7.78%
J-823	94	J-823	103	-9	-9.6%	J-823	93	J-823	101	-8	-8.6%	J-823	92	J-823	99	-7	-7.61%
J-824	90	J-824	99	-9	-10.0%	J-824	89	J-824	97	-8	-9.0%	J-824	87	J-824	95	-8	-9.20%
J-825	82	J-825	81	1	1.2%	J-825	81	J-825	79	2	2.5%	J-825	80	J-825	76	4	5.00%
J-826	88	J-826	96	-8	-9.1%	J-826	87	J-826	94	-7	-8.0%	J-826	85	J-826	91	-6	-7.06%
J-827	83	J-827	92	-9	-10.8%	J-827	82	J-827	89	-7	-8.5%	J-827	80	J-827	87	-7	-8.75%
J-828	92	J-828	101	-9	-9.8%	J-828	91	J-828	99	-8	-8.8%	J-828	90	J-828	97	-7	-7.78%

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-829	86	J-829	95	-9	-10.5%	J-829	85	J-829	93	-8	-9.4%	J-829	84	J-829	91	-7	-8.33%
J-83	89	J-83	88	1	1.1%	J-83	88	J-83	85	3	3.4%	J-83	88	J-83	82	6	6.82%
J-830	89	J-830	89	0	0.0%	J-830	88	J-830	86	2	2.3%	J-830	88	J-830	84	4	4.55%
J-831	88	J-831	96	-8	-9.1%	J-831	87	J-831	94	-7	-8.0%	J-831	85	J-831	92	-7	-8.24%
J-832	54	J-832	62	-8	-14.8%	J-832	53	J-832	60	-7	-13.2%	J-832	51	J-832	58	-7	-13.73%
J-833	76	J-833	76	0	0.0%	J-833	76	J-833	74	2	2.6%	J-833	75	J-833	71	4	5.33%
J-834	72	J-834	70	2	2.8%	J-834	71	J-834	66	5	7.0%	J-834	70	J-834	61	9	12.86%
J-835	70	J-835	77	-7	-10.0%	J-835	66	J-835	71	-5	-7.6%	J-835	64	J-835	64	0	0.00%
J-836	73	J-836	73	0	0.0%	J-836	73	J-836	71	2	2.7%	J-836	72	J-836	70	2	2.78%
J-837	94	J-837	93	1	1.1%	J-837	93	J-837	90	3	3.2%	J-837	92	J-837	87	5	5.43%
J-838	92	J-838	91	1	1.1%	J-838	91	J-838	89	2	2.2%	J-838	90	J-838	87	3	3.33%
J-839	59	J-839	67	-8	-13.6%	J-839	57	J-839	64	-7	-12.3%	J-839	55	J-839	60	-5	-9.09%
J-840	92	J-840	101	-9	-9.8%	J-840	91	J-840	99	-8	-8.8%	J-840	90	J-840	97	-7	-7.78%
J-841	83	J-841	92	-9	-10.8%	J-841	82	J-841	90	-8	-9.8%	J-841	81	J-841	88	-7	-8.64%
J-842	105	J-842	111	-6	-5.7%	J-842	102	J-842	105	-3	-2.9%	J-842	100	J-842	97	3	3.00%
J-843	105	J-843	104	1	1.0%	J-843	105	J-843	101	4	3.8%	J-843	104	J-843	98	6	5.77%
J-844	101	J-844	100	1	1.0%	J-844	100	J-844	98	2	2.0%	J-844	99	J-844	96	3	3.03%
J-845	110	J-845	118	-8	-7.3%	J-845	108	J-845	116	-8	-7.4%	J-845	107	J-845	114	-7	-6.54%
J-846	47	J-846	46	1	2.1%	J-846	47	J-846	43	4	8.5%	J-846	46	J-846	40	6	13.04%
J-847	87	J-847	86	1	1.1%	J-847	86	J-847	84	2	2.3%	J-847	85	J-847	81	4	4.71%
J-848	101	J-848	100	1	1.0%	J-848	100	J-848	98	2	2.0%	J-848	100	J-848	96	4	4.00%
J-849	95	J-849	104	-9	-9.5%	J-849	94	J-849	102	-8	-8.5%	J-849	92	J-849	99	-7	-7.61%
J-850	81	J-850	90	-9	-11.1%	J-850	80	J-850	87	-7	-8.8%	J-850	78	J-850	85	-7	-8.97%
J-851	66	J-851	65	1	1.5%	J-851	65	J-851	62	3	4.6%	J-851	64	J-851	60	4	6.25%
J-852	67	J-852	66	1	1.5%	J-852	66	J-852	64	2	3.0%	J-852	66	J-852	62	4	6.06%
J-853	87	J-853	96	-9	-10.3%	J-853	86	J-853	94	-8	-9.3%	J-853	85	J-853	91	-6	-7.06%
J-854	92	J-854	101	-9	-9.8%	J-854	91	J-854	98	-7	-7.7%	J-854	89	J-854	96	-7	-7.87%
J-855	97	J-855	106	-9	-9.3%	J-855	96	J-855	104	-8	-8.3%	J-855	95	J-855	101	-6	-6.32%
J-856	102	J-856	101	1	1.0%	J-856	101	J-856	99	2	2.0%	J-856	100	J-856	97	3	3.00%
J-858	77	J-858	85	-8	-10.4%	J-858	76	J-858	83	-7	-9.2%	J-858	74	J-858	80	-6	-8.11%
J-86	87	J-86	96	-9	-10.3%	J-86	86	J-86	94	-8	-9.3%	J-86	84	J-86	91	-7	-8.33%
J-861	45	J-861	53	-8	-17.8%	J-861	44	J-861	51	-7	-15.9%	J-861	42	J-861	49	-7	-16.67%
J-868	95	J-868	94	1	1.1%	J-868	94	J-868	92	2	2.1%	J-868	93	J-868	90	3	3.23%
J-869	95	J-869	94	1	1.1%	J-869	94	J-869	92	2	2.1%	J-869	93	J-869	90	3	3.23%
J-87	86	J-87	95	-9	-10.5%	J-87	85	J-87	93	-8	-9.4%	J-87	84	J-87	91	-7	-8.33%
J-870	95	J-870	94	1	1.1%	J-870	94	J-870	92	2	2.1%	J-870	93	J-870	90	3	3.23%
J-871	88	J-871	96	-8	-9.1%	J-871	87	J-871	94	-7	-8.0%	J-871	85	J-871	92	-7	-8.24%
J-872	88	J-872	96	-8	-9.1%	J-872	87	J-872	94	-7	-8.0%	J-872	85	J-872	92	-7	-8.24%
J-9	98	J-9	104	-6	-6.1%	J-9	94	J-9	97	-3	-3.2%	J-9	92	J-9	89	3	3.26%
J-905	88	J-905	96	-8	-9.1%	J-905	87	J-905	94	-7	-8.0%	J-905	85	J-905	92	-7	-8.24%
J-906	88	J-906	96	-8	-9.1%	J-906	87	J-906	94	-7	-8.0%	J-906	85	J-906	92	-7	-8.24%
J-907	88	J-907	96	-8	-9.1%	J-907	87	J-907	94	-7	-8.0%	J-907	85	J-907	92	-7	-8.24%
J-908	88	J-908	96	-8	-9.1%	J-908	87	J-908	94	-7	-8.0%	J-908	85	J-908	92	-7	-8.24%
J-909	92	J-909	100	-8	-8.7%	J-909	91	J-909	98	-7	-7.7%	J-909	89	J-909	96	-7	-7.87%
J-910	57	J-910	64	-7	-12.3%	J-910	54	J-910	61	-7	-13.0%	J-910	52	J-910	57	-5	-9.62%
J-913	102	J-913	108	-6	-5.9%	J-913	99	J-913	101	-2	-2.0%	J-913	97	J-913	92	5	5.15%
J-914	109	J-914	114	-5	-4.6%	J-914	105	J-914	108	-3	-2.9%	J-914	103	J-914	98	5	4.85%
J-918	68	J-918	67	1	1.5%	J-918	67	J-918	65	2	3.0%	J-918	67	J-918	64	3	4.48%

Hopkinton-Southborough Interconnection Evaluation

Southborough Level of Service Evaluation Data																	
Scenario 1 - Southborough ADD		Scenario 2 - Soutborough/Hopkinton ADD (incl. 1 MGD to Ashland)				Scenario 3 - Southborough MDD		Scenario 4 - Southborough/Hopkinton MDD (incl. 1 MGD to Ashland)				Scenario 5 - Southborough Buildout MDD		Scenario 6 - Southborough Buildout MDD/Hopkinton 2.7 MGD			
Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)	Junction	Pressure (psi)	Junction	Pressure (psi)	Difference (psi)	Difference (%)
J-919	71	J-919	70	1	1.4%	J-919	70	J-919	68	2	2.9%	J-919	70	J-919	66	4	5.71%
J-92	31	J-92	58	-27	-87.1%	J-92	30	J-92	52	-22	-73.3%	J-92	29	J-92	47	-18	-62.07%
J-93	31	J-93	58	-27	-87.1%	J-93	30	J-93	53	-23	-76.7%	J-93	30	J-93	47	-17	-56.67%
J-94	78	J-94	76	2	2.6%	J-94	77	J-94	72	5	6.5%	J-94	77	J-94	68	9	11.69%
J-95	78	J-95	76	2	2.6%	J-95	77	J-95	72	5	6.5%	J-95	77	J-95	68	9	11.69%
J-96	94	J-96	93	1	1.1%	J-96	93	J-96	91	2	2.2%	J-96	93	J-96	89	4	4.30%
J-97	94	J-97	93	1	1.1%	J-97	93	J-97	91	2	2.2%	J-97	92	J-97	88	4	4.35%
J-98	22	J-98	22	0	0.0%	J-98	22	J-98	22	0	0.0%	J-98	22	J-98	21	1	4.55%
J-99	22	J-99	22	0	0.0%	J-99	22	J-99	22	0	0.0%	J-99	22	J-99	21	1	4.55%