

Abenaki Water Company and Aquarion Company

DW 21-090

Abenaki Water Company and Aquarion Company's Responses to Omni Data Requests—Set 1

Data Request Received: October 18, 2021
Request No.: Omni 1-001

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

REQUEST: Please refer to page 69 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree with the Safety Staff Recommendations contained in paragraph #1, i.e., that a qualified independent operations and management consultant should be appointed to oversee the day to day operations for a period of 6 months and report to the Department and/or Commission on a biweekly basis the status and results of findings regarding the items listed in points 2 through 12 (contained in pages 69-71 of the Investigation Report).
- b) Please state the basis for the response to Data Request 1-001 (a), above.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 1, the Joint Petitioners recognize the critical importance of providing safe and reliable water service to Abenaki customers and the concerns of Safety Staff underlying the Investigation Report. The Joint Petitioners do not agree it is necessary for the Commission to engage a "qualified independent operations and management consultant" to oversee Abenaki's operations, but have determined that the proposed acquisition provides an opportunity to address Safety Staff's concerns in an efficient manner.

To address these concerns, Abenaki proposes to utilize Aquarion as its consultant to oversee Abenaki's operations for a period of 6 months or until Aquarion acquires ownership of Abenaki in the proposed transaction, whichever occurs sooner. Upon closing, Aquarion will oversee Abenaki's operations in the ordinary course of business, in the same manner as Aquarion oversees the operations of its other utilities, with a strong focus on safety, reliability and customer service. If required by the Commission, Aquarion could provide periodic reporting prior to closing or for the full 6-month period if that extends into Aquarion's ownership of Abenaki. Aquarion's technical resources and experience with owning and operating water systems (both small and large) will provide an immediate positive impact for Abenaki customers. This additional oversight will also align with the integration work Aquarion is currently performing in anticipation of ownership of Abenaki, making this an effective and efficient option.

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b) See above.

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Data Request Received: October 18, 2021
Request No.: Omni 1-002

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

REQUEST: Please refer to page 69 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree with the Safety Staff Recommendations contained in paragraph #2, i.e., that Abenaki's emergency response plan should specifically address the 1.5 hours it currently takes company personnel to respond to Rosebrook Water System emergencies from Abenaki's base in Gilford, and that the plan should explicitly cite and detail any mutual aid agreements if such agreements constitute a significant factor within the Company's emergency response plan.
- b) Please state the basis for the response to Data Request 1-002 (a), above.
- c) Please describe the steps, if any, that have been taken to comply with this recommendation.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 2, Abenaki recognizes the importance of quickly responding to system emergencies and is seeking the services of an additional qualified and licensed service provider to aid in the emergency response. Abenaki has contacted a local contractor familiar with the system, who has responded to emergencies in the past and is willing to continue to do so. Abenaki plans to seek additional support from other nearby contractors and utilities to ensure proper emergency response.

- b) See above.
- c) See above.

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Data Request Received: October 18, 2021
Request No.: Omni 1-003

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

REQUEST: Please refer to page 70 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree with the Safety Staff Recommendations contained in paragraph #3, i.e., that Abenaki should develop a detailed comprehensive Safety Policy within 60 days of the acceptance of the Investigation Report and its findings, and that such Safety Policy should specifically address the Rosebrook Water System and the characteristics of its water operations and facilities.
- b) Please state the basis for the response to Data Request 1-003 (a), above.
- c) Please describe the steps, if any, that have been taken to comply with this recommendation.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 3, safety is a priority at Aquarion as is indicated by a comprehensive safety program comprised of multiple elements including a Safety Handbook, policies for specific safety hazards (e.g., confined space), safety improvement processes for specific work activities (along with regular observation/documentation of adherence to these processes), regular safety training, practices and policies related to reporting and documentation of accidents, practices for the identification and mitigation of safety hazards, and weekly review of accidents by the executive team.. This same safety program will be applied to Abenaki's operations. Aquarion has made it a priority upon closing to provide safety training to Abenaki employees.

- b) See above.
- c) See above.

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Data Request Received: October 18, 2021
Request No.: Omni 1-004

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

REQUEST: Please refer to page 70, paragraph #7 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree that Abenaki should hire an engineering firm to validate, update, and correct, as needed, As Built infrastructure drawings that can be relied upon for system operations and planning, and state whether rate payers should bear the burden of this incremental cost.
- b) Please state the basis for the response to Data Request 1-004 (a), above.
- c) Please describe the steps, if any, that have been taken to comply with this recommendation.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 7, Abenaki is presently updating the As-Built plans using in-house staff, based on ongoing field work and observations, and is working toward a completion date of December 31, 2021 for its updated plans. Aquarion has provided GPS equipment to help in this effort. The ability and speed at which these objectives can be accomplished will be enhanced by approval of the proposed transaction as it will enable Aquarion to directly apply its resources to expediting safe and prudent solutions. If required by the Commission, Abenaki could submit copies of the completed As-Built plans upon completion in an appropriate docket. To the extent mapping costs are incurred for company operations, such costs would be included for recovery in a future rate case consistent with past practice.

- b) See above.
- c) See above.

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Data Request Received: October 18, 2021
Request No.: Omni 1-005

Date of Response: October 22, 2021
Witness: Nicholas LaChance/John Walsh

REQUEST: Please refer to page 70 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree with the Safety Staff Recommendations contained in paragraph #8, i.e., that the Commission should order compliance with annual system maintenance requirements including valve maintenance, hydrant flushing, pump house equipment, flushing dead end mains as discussed in Element #2 of the Investigation Report, as well as all applicable requirements in Puc 600 rules, and predetermine any potential civil penalties for consideration pursuant to RSA 365:41 if requirements are not met.
- b) Please state the basis for the response to Data Request 1-005 (a), above.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 8, Abenaki is performing ongoing system maintenance, including valve and hydrant inspection and operation, hydrant flushing, flushing of dead-ends and meter tests.

In terms of compliance with PUC 600 rules, Aquarion has a complete understanding of these rules because of its experience operating a large water system in New Hampshire for nearly 20 years. Aquarion understands the importance and value of compliance with these rules, and will ensure compliance, particularly relative to the 14 non-compliance items described in the Investigation Report.

- b) See above.

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Data Request Received: October 18, 2021
Request No.: Omni 1-006

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

REQUEST: Please refer to page 70, paragraph #9 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree that Abenaki should hire an engineering firm to inspect valves above and below ground for wear/tear/corrosion, valves inadequately rated for working pressures, nonfunctioning valves and related equipment, etc., and to provide a plan and schedule for replacement of identified components.
- b) Please state the basis for the response to Data Request 1-006 (a), above.
- c) Please describe the steps, if any, that have been taken to comply with this recommendation.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 9, subsequent to the field work for this investigation, Abenaki has undertaken a comprehensive evaluation of the system's valves, the results of which are documented in the attached valve inventory (Omni 1-006 Attachment 1). This effort included above-ground inspection and an operational test to confirm whether a valve is operable. Retaining an engineering firm would be duplicative of the efforts conducted to date. Abenaki would propose that Aquarion provide oversight of further evaluations and repairs/replacements and include progress updates with any periodic reporting as may be required by the Commission (see response to Omni 1-001).

For any valve found to be inoperable, Abenaki will determine whether an underground inspection and/or replacement/repair is appropriate.

The ability and speed at which these objectives can be accomplished will be enhanced by approval of the proposed transaction as it will enable Aquarion to directly apply its resources to expediting safe and prudent solutions.

- b) See above.
- c) See above.

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Omni 1-006 Attachment 1
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Gate Valve	Location	Size	Type	Turns to Open 11/4/99	Turns to Open New	Opens L or R	Inspection Date	Inspected By	Operable ¹	Comments
2A	Storage Tank - 36' from opening to trail, Gate Right of Storage Tank	16"	G		51		1999	unknown		Provan & Lorber Map - Did Not Operate
							11/1/2018	unknown		Good
		16"	G			L	8/10/2021	T. deOgburn	YES	Good
2B	Ski Slope -In Clump of Trees, uphill of bunny slope lift	10"	G	42.5	33		1999	unknown		Provan & Lorber Map - Too many turns to open
							11/1/2018	unknown		Good
							8/18/21	T. deOgburn	NO	Could not locate/road has change since 2018. Appears road was widened and gravel packed over valve location.
		10"	G				Needs addt'l work			
2C	Ski Slope -Right side of road towards bunny slope lift, 24' from light post	4"	G	23.5	14		1999	unknown		Provan & Lorber Map - Good
							11/1/2018	unknown		Good
		4"	G			L	8/18/2021	T. deOgburn	YES	Good
2D	Ski Slope - Left side of Bunny slope, towards FC 31 & 32, 17' from left side of tree line / 30 from right	10"	G	32	33		1999	unknown		Provan & Lorber Map - seems ok
							11/1/2018	unknown		Good
		10"	G			L	8/18/2021	T. deOgburn	YES	Good
2E	Rosebrook - 14' from edge of pavement, 6' right of stairway to bldg N 11-16	6"	G	14.5	20		1999	unknown		Provan & Lorber Map - Not enough turns to open
							11/1/2018	unknown		Good
		6"	G			L	7/21/2021	T. deOgburn	YES	Good
2F	Rosebrook -				33		1999	unknown		Provan & Lorber Map - Could not Find
							2018	unknown		Need to Locate
							7/21/21	T. deOgburn	NO	Found Out spot in pavement that could be the location of 2F. Pavement needs to be cut to confirm
							Needs addt'l work			
2G	Rosebrook - 6' from Light Post in front on townhomes Unit 1	4"	G	22.5	14		1999	unknown		Provan & Lorber Map - Too many turns to open
							11/1/2018	unknown		Good
		4"	G			L	7/21/2021	T. deOgburn	YES	Good - 10' Key - Put riser on due to landscaping
2H	Rosebrook - 12' from light post, 8' from edge of sewer lid	10"	G		33		1999	unknown		Provan & Lorber Map - Did not Operate
							11/1/2018	unknown		Good
		10"	G			L	7/21/2021	T. deOgburn	YES	Good
2I	Forest Cottage - 5.5" left of bottom of Forest Lane	8"	G	26	26		1999	unknown		Provan & Lorber Map - Seems ok
							11/1/2018	unknown		Good/BO
		8"	G			L	7/21/2021	T. deOgburn	YES	Good - Water/Mud Needs to be cleaned Out
2J	Forest Cottage	10"	G	33	33		1999	unknown		Provan & Lorber Map - Seems ok
							2018	unknown		Need to Locate
							7/21/21	T. deOgburn	NO	Need to locate- Could not locate
		10"	G				Needs addt'l work			
2K	Forest Cottage - Inside Rock Wall at beginning of FC/Remick Ln	10"	G		33		1999	unknown		Provan & Lorber Map - Full of gravel - could not turn
							11/1/2018	unknown		Good
		10"	G			L	8/5/2021	T. deOgburn	YES	Good

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2L	Forest Cottage - 98" from Green Electrical Box, 29" from Lamp Post on corner of Forest Lane	10"	G	33	33		1999	unknown		Provan & Lorber Map - Seems ok
							11/1/2018	unknown		Good
		10"	G			L	8/5/2021	T. deOgburn	YES	OK 10" key. The longer wrench & risers being out of alignment make turning the valve awkward
2M	Forest Cottage - Near Hydrant 09						1999	unknown		Provan & Lorber Map - Valve Size & Location Unknown
							11/1/2018	unknown		Good
						I	8/5/2021	T. deOgburn	YES	Good
2N	Forest Cottage - Near Hydrant 09						1999	unknown		Provan & Lorber Map - Valve Size & Location Unknown
							11/1/2018	unknown		Good
						L	8/5/2021	T. deOgburn	YES	Ok-Plant should be removed, makes accessing and turning gate key difficult
2O	Forest Cottage - Directly across from FC Unit 22 on right side of road	8"	G		26		1999	unknown		Provan & Lorber Map - Does not turn
							2018	unknown		Not Good/BO Can't operate/BO
		8"	G				8/5/21 Needs addt'l work	T. deOgburn	NO	Not Good - can't Operate - Gate Key slips on nut
3A	Ski Lodge -	16"	G	47.5	51		1999	unknown		Provan & Lorber Map - Seems ok
							2018	unknown		Does not exist - FX Lyons dug for a day and tried looking for gate
		16"	G				8/18/21 Needs addt'l work	T. deOgburn	NO	Could not locate
3B	Ski Lodge - 30' from left corner of Base Lodge by Truck unloading double doors	12"	G	37.5	39		1999	unknown		Provan & Lorber Map - Seem ok
							11/2/2018	unknown		Good
		12"	G				8/18/21 Needs addt'l work	T. deOgburn	NO	Need about 2' of riser to bring to grade/ will have to hand dig, bring to grade then inspect
3C	Pump Station - In Front of Pump Station - (use 10' wrench)	16"	G		51		1999	unknown		Provan & Lorber Map - Full of Gravel
							2018	unknown		Not Good/BO - Need blown out
		16"	G			L	7/15/2021	T. deOgburn	YES	Good, Gate Box cleaned out. 8' key almost bottoms out
3D	Pump Station -	16"	G		51		1999	unknown		Provan & Lorber Map - Did not operate
							2018	unknown		Valve does not have nut on it/was told by FX Lyons that it doesn't have any guts inside
		16"	G			L	7/15/2021	T. deOgburn	YES	Good, Need 10' wrench to get onto operating nut.
3E	Crawford Ridge - 16' from corner of Rivers Edge & Crawford Ridge Rd, Gate controls water to Rivers Edge Rd	8"	G	27.5	26		1999	unknown		Provan & Lorber Map - Seems ok
							11/2/2018	unknown		Good/BO - Gate full of water/mud
		8"	G			L	7/21/2021	T. deOgburn	NO	Unsure if key is sitting on operating nut or compacted dirt. Need to assess further (7/21/21).
		8"	G			L	8/6/2021	T. deOgburn	YES	Good-Cleaned remainder of dirt
3F	Crawford Ridge - 17' from Corner of Rivers Edge	12"	G	40	39		1999	unknown		Provan & Lorber Map - Seems ok
							11/2/2018	unknown		Good/BO - Gate didn't want to move/finally worked it an got it free
		12"	G			L	7/21/2021	T. deOgburn	NO	Need a longer gate box cleaner to clean mud/sand.
		12"	G			L	8/6/2021	T. deOgburn	YES	Good-Cleaned remainder of dirt

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3G	Crawford Ridge - 67' from Corner of Porch of CR Unit 9	12"	G	40	39		1999	unknown		Provan & Lorber Map - Seems ok
							11/2/2018	unknown		Good/BO, Gate full of water
		12"	G			L	7/21/2021	T. deOgburn	YES	Good - Cleaned out mud and water
3H	Crawford Ridge - in between CR14/CR15 34.5' from porch to CR15	4"	G		14		1999	unknown		Provan & Lorber - Did not operate
							2018	unknown		Not Good/BO - Can't get on operating nut
		4"	G				7/21/21 Needs addt'l work	T. deOgburn	NO	Did not operate. Operating nut appears to be broken. Should be repaved around cover.
3I	Crawford Ridge - 10' from porch to CR22	4"	G		14		1999	unknown		Provan & Lorber Map - Did not operate
							11/2/2018	unknown		Good - Gate was hard at first but got it free
		4"	G			L	7/21/2021	T. deOgburn	YES	Good - noticed more resistance when operating this valve.
3J	At Drummond Ski shop	8"	G		26		1999	unknown		Provan & Lorber Map - Did not operate
							10/13/21 Needs addt'l work		NO	
		8"	G							Could not locate
3K	Valve on right side of road in front of Presidential Views Unit 5									Not Listed on Provan & Lorber Map
							11/2/2018	unknown		Good
						L	8/18/2021	T. deOgburn	YES	Good
3L	Middle of Avalon and Crawford Ridge Road									Not Listed on Provan & Lorber Map
							11/2/2018	unknown		Good
						L	7/21/2021	T. deOgburn	YES	ok - cleaned riser of water/mud. Riser is at an angle so the key hits the riser on every turn
3M	Middle of Avalon and Crawford Ridge Road									Not Listed on Provan & Lorber Map
							11/2/2018	unknown		Not Good/BO - Gate full of dirt
						L	7/21/2021	T. deOgburn	YES	Good - cleaned riser of dirt. Filled to gate cover approx. 6'
3N	70' up hill of hydrant 13, in right side of road going up to Presidential Views *Note this valve was renumbered from 3J to 3N									Not listed on Provan & Lorber map
							2018	unknown		Need to Locate
		8"	G				7/21/21 Needs addt'l work	T. deOgburn	NO	Does not operate. Operating nut appears to be broken
4A	Rte 302 West	8"	G		26		1999	unknown		Provan & Lorber Map - Did not operate
							2018	unknown		Need to Locate
		8"	G				8/18/21 Needs addt'l work	T. deOgburn	NO	Need to locate- Could not locate
4B	302/Cog Rd - Left side of road by train to cog, 19' from left edge of track	16"	G	50.5	51		1999	unknown		Provan & Lorber Map - Seems ok
							11/2/2018	unknown		Good/BO
		16"	G			L	7/20/2021	T. deOgburn	YES	Good - Could be brought more to grade, but it only becomes an issue in winter
4C	302/Cog Rd - 11.5' from Electric Pole	8"	G	19	26		1999	unknown		Provan & Lorber Map - Seems Ok
							11/2/2018	unknown		Good
		8"	G			L	7/20/2021	T. deOgburn	YES	Good

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4D	Cog Road - at exit of MVP	16"	B	46			1999	unknown		Provan & Lorber Map - Seems Ok
							2018	unknown		Not Good/BO Couldn't get on nut/BO
		16"	B			L	7/20/2021	T. deOgburn	YES	Good - Cleaned riser of water, the was about 12" of mud I cleaned but I reached the limit of my gate box cleaner. Was able to push key through 18" of thick mud and was able to access oper. nut. Riser needs to be cleaned completely. Riser Cover to grade w/patch (about 6" below grade).
4E	Mt. Wash Entr. -	8"	G	26	26		1999	unknown		Provan & Lorber Maps - Seems ok
							11/2/2018	unknown		Good
		8"	G			L	7/19/2021	T. deOgburn	YES	Good. Cleaned gate box of mud
4F	Mt. Wash. Pl - at entrance of MWP by hydrant #22	16"	B	49.5			1999	unknown		Provan & Lorber Map - Seems ok
							11/2/2018	unknown		Good/BO
		16"	B			L	7/15/2021	T. deOgburn	YES	Good - Cleaned riser of mud and water
4G	Mt. Wash. Pl - at entrance of MWP, by Hydrant #22	8"	G	24.5	26		1999	unknown		Provan & Lorber Map - Seems ok
							11/2/2018	unknown		Good/BO
		8"	G			L	7/15/2021	T. deOgburn	YES	Good Cleaned riser of water and mud
4H	Mt. Wash. Pl. - at entrance of Appleby Close/Closest to Hydrant #23	8"	G		26		1999	unknown		Provan & Lorber Map - full of gravel - could not turn
							2018	unknown		Not Good/BO
		8"	G				7/15/21 Needs addt'l work	T. deOgburn	NO	Not Good / Operating nut needs to be replaced
4I	Mt. Wash. Pl - at entrance of Appleby Close/ closest to bus stop	8"	25.5	26			1999	unknown		Provan & Lorber Map - Seems ok
							11/2/2018	unknown		Good/BO - Full of water
		8"	G			L	7/15/2021	T. deOgburn	YES	Good. Cleaned riser of water and mud
4J	Mt. Wash. Pl - at entrance of Appleby Close/ Shuts Appleby close off	8"	G	26.5	26		1999	unknown		Provan & Lorber Map - Seem ok
							11/2/2018	unknown		Good/BO - Full of Water
		8"	G			L	7/15/2021	T. deOgburn	YES	Good - Cleaned riser of dirt and water - Should be brought to grade with riser and patch
4K	Mt. Wash. Pl - Entrance to Hartford Ln	12"	G		39		1999	unknown		Provan & Lorber Map - Full of Gravel - could not turn
							11/2/2018	unknown		Good/BO - Full of Water
		12"	G			L	7/15/2021	T. deOgburn	YES	Good - Cleaned riser of water/mud
4L	L-2 Subdiv. - In Front of 45 Hartford La	8"	G		26		1999	unknown		Provan & Lorber Map - Did not operate
							2018	unknown		Not Good/BO
		8"	G				7/15/21 Needs addt'l work	T. deOgburn	NO	Valve box paved over - Need to cut back pavement to assess.
4M	Mt. Wash. Pl - Entrance to Hartford Lane Ext.	8"	G	24.5	26		1999	unknown		Provan & Lorber Map - Seem ok
							11/2/2018	unknown		Good/BO - Full of water
		8"	G			L	7/15/2021	T. deOgburn	YES	Good. Cleaned riser of mud/water. Bring to grade
4N	Mt. Wash Pl - Entrance to Hartford Ln Ext.	8"	G	24.5	26		1999	unknown		Provan & Lorber Map - Seems ok
							11/2/2018	unknown		Good/BO - Full of Water
		8"	G			L	7/15/2021	T. deOgburn	YES	Good. Cleaned riser of mud/water. Bring to grade

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4O	In road across from Hydrant #29	8"	G		26		1999	unknown		Provan & Lorber - Did not operate
							11/2/2018	unknown		Good
		8"	G			L	7/19/2021	T. deOgburn	YES	Good
4P	Mt. Wash. Pl - In Road across from Hydrant #29	8"	G	25.5	26		1999	unknown		Provan & Lorber - Seems ok
							11/2/2018	unknown		Good
						L	7/19/2021	T. deOgburn	YES	ok - Valve hard to operate initially. Valve would not operate initially. After several efforts, valve freed up and turned w/ difficulty. After turning the valve several times it began to spin normally
4Q	Mt. Wash Pl - Dartmouth Ridge - 10' slightly right of Hydrant #30	8"	G		26		1999	unknown		Provan & Lorber Map - Did not Operate
							11/2/2018	unknown		Good - Valve stays closed
		8"	G			L	Needs addt'l work	T. deOgburn	YES	Good - valve remains closed. Hydrant valve operates but skips just before fully closing.
4R	Left side of Road beginning of Stone hill and at the end of MWP Units 19-22									Not Listed on Provan & Lorber Map
							11/2/2018	unknown		Good
						L	7/15/2021	T. deOgburn	YES	Ok-Cleaned riser of mud. Operating nut can be accessed but the nut runs along side of riser making it harder to access at first
5A	Stickney Cir. - at beginning of Stickney Way	6"	G		20		1999	unknown		Provan & Lorber Map - Seems ok
							2018	unknown		
		6"	G			L	7/20/2021	T. deOgburn	YES	ok - riser appears to have stones in it. Making the operation of the valve less smooth. Should be cleaned further
5B	Fairway Vill. - 21' from light post at beginning of Fairway Ext FWV	8"	G	25.5	26		1999	unknown		Provan & Lorber Map - Seems Ok
							11/6/2018	unknown		Good/BO - Gate full of water/mud
		8"	G			L	7/20/2021	T. deOgburn	YES	Good - Cleaned Gate full of water/mud
5C	Fairway Vill. - 10' from sewer cover in front of sand trap in FWV	8"	G	25	26		1999	unknown		Provan & Lorber Map - Seems Ok
							11/6/2018	unknown		Good/BO
		8"	G			L	Needs addt'l work	T. deOgburn	YES	Ok - full of mud/water - cleaned out. Top of riser is broken, need a thinner cover so it sits lower. Riser needs to be repaired/replaced 7/20/21
5D	Fairway Dr. - 20' from sewer cover in front of sand trap in FWV	16"	B	30.5			1999	unknown		Provan & Lorber Map - Seem ok
							11/6/2018	unknown		Good
		16"	B			L	7/20/2021	T. deOgburn	YES	Good Cleaned riser of mud/water
5E	Fairway Vill - 52' from light post on Car barn Ct FWV, at beginning of Car barn	8"	G	25.5	26		1999	unknown		Provan & Lorber Map - Seem ok
							2018	unknown		Not Good/BO - Full of Sand
		8"	G				7/20/2021	T. deOgburn	YES	Good - Cleaned riser of sand
5F	Cog Road - On Base Rd right side in front of Horse Barn	8"	G	26	26		1999	unknown		Provan & Lorber Map - Seem ok
							11/6/2018	unknown		Good
		8"	G			L	7/20/2021	T. deOgburn	YES	Good
5G	Cog Road - On Base Road right side in front of Horse Barn	6"	G	20	20		1999	unknown		Provan & Lorber Map - Seem ok
							11/6/2018	unknown		Good/BO
		6"	G			L	7/20/2021	T. deOgburn	YES	Good
5H	Cog/Stickney	6"	G	19	20		1999	unknown		Provan & Lober Map - Full of Gravel - Could not turn
							11/6/2018	unknown		
		6"	G			L	7/20/2021	T. deOgburn	YES	Good - Cleaned out mud/water

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Omni 1-006 Attachment 1
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		6"	G	19	20		1999	unknown		Provan & Lorber Map - Seem ok
5I	Stickney Dr. - at beginning of Stickney Way						11/6/2018	unknown		Good
							7/21/21		YES	Able to access nut but very difficult to turn. Look at
		6"	G			L	Needs addt'l work	T. deOgburn		for replacement/further assessment
5J	Stickney Dr -	6"	G		20		1999	unknown		Provan & Lorber Map - Did not operate
							2018	unknown		Need to Locate
		6"	G				7/20/21		NO	
							Needs addt'l work	T. deOgburn		Could not locate
5K	L-2 Subdiv. - In middle of Hartford Ln at beginning of Able by MM	8"	G		26		1999	unknown		Provan & Lorber Map - Did not operate
							11/6/2018	unknown		Good/BO - Full of mud and water
		8"	G			L	8/18/2021	T. deOgburn	YES	Good
5L	Cog Road - Base Road near Fairway Ext	8"	G		26		1999	unknown		Provan & Lorber Map - Did not operate
							11/6/2018	unknown		Good
		8"	G			L	7/20/2021	T. deOgburn	YES	OK - is supposedly at the end of the main near a cap.
5M	Cod Rd/FWV - Base Road near FWV Ext	16"	B	44			1999	unknown		Provan & Lorber Map - Seem ok
							2018	unknown		Not Good/BO - Full of pavement/gravel
		16"	B			L	8/13/2021	T. deOgburn	YES	Cleaned out about 6' of sand/gravel/pavement. Need a longer Gate Box cleaner/Cleaned out remainder of dirt (8/13/21)
5N	Base Road at entrance to SC						11/6/2018	unknown		Not Listed on Provan & Lorber Map
						L	8/13/2021	T. deOgburn	YES	Good
7A	at Bretton Arms	16"	G		51					Provan & Lorber Map (No Comments)
		16"	G				8/13/21		NO	Map shows one valve but there are 2 next to each other near the Bretton Arms. This is also a dead end according to the map, so lines need to be traced before the valves are inspected for precautionary measures.
							Needs addt'l work	T. deOgburn		

Abenaki Water Company and Aquarion Company

DW 21-090

Abenaki Water Company and Aquarion Company's Responses to Omni Data Requests—Set 1

Data Request Received: October 18, 2021
Request No.: Omni 1-007

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

REQUEST: Please refer to page 70 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree with the Safety Staff Recommendations contained in paragraph #10, i.e., that Abenaki should verify and produce an accurate accounting of system pipe sizes and lengths, and develop and maintain an accurate inventory of customer pressure relief valves associated with each water service.
- b) Please state the basis for the response to Data Request 1-007 (a), above.
- c) Please describe the steps, if any, that have been taken to comply with this recommendation.
- d) If the Joint Petitioners agree with the above-stated recommendation, please state the deadline by which Abenaki will comply with this recommendation.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 10, Abenaki is working to verify and will produce an accurate accounting of pipe sizes and lengths using field evaluations and observations. Work on this has already begun and will be updated along with the updated As-Built plans and included in the Company's Annual Report to the Commission. Abenaki is not responsible for maintaining an inventory of customer-owned pressure reducing valves (PRVs). The responsibility of maintaining these PRVs should remain with their owners and not the utility as outlined in Abenaki's tariff.

- b) See above.
- c) See above.
- d) See above.

Abenaki Water Company and Aquarion Company

DW 21-090

Abenaki Water Company and Aquarion Company's Responses to Omni Data Requests—Set 1

Data Request Received: October 18, 2021
Request No.: Omni 1-008

Date of Response: October 22, 2021
Witness: Nicholas LaChance/John Walsh

REQUEST: Please refer to pages 70 -71 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree with the Safety Staff Recommendations contained in paragraph #11, i.e., that Abenaki should complete repairs of inoperable valves and other non- or mal-functioning equipment, including fire hydrants and above-ground equipment within the pump station, and that such repairs be completed prior to any potential acquisition by Aquarion.
- b) Please state the basis for the response to Data Request 1-008 (a), above.
- c) Please describe the steps, if any, that have been taken to comply with this recommendation.
- d) If the Joint Petitioners agree with the above-stated recommendation, please state the deadline by which Abenaki will comply with this recommendation.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 11, Abenaki agrees that any non-functioning equipment necessary for serving customers should be repaired. Details are provided below.

Valves: Please see the response to Omni 1-006 for a valve inventory and status; as noted therein, subsequent to the field work for this investigation, Abenaki has undertaken a more comprehensive evaluation of the system's valves. By December 31, 2021, the Company will develop a plan for addressing inoperable valves.

Hydrants: An inventory and status of hydrants is shown in Omni 1-008 Attachment 1. Most of the hydrants have been inspected and operated in 2021. The remaining hydrants will be inspected by mid-November 2021; note that Omni has requested that hydrants on their property not be operated until late October. The Company will coordinate closely with Omni when inspecting

Abenaki Water Company and Aquarion Company

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Abenaki Water Company and Aquarion Company's Responses to Omni Data Requests—Set 1

Data Request Received: October 18, 2021
Request No.: Omni 1-008

Date of Response: October 22, 2021
Witness: Nicholas LaChance/John Walsh

and operating these hydrants. Hydrants that need maintenance (e.g. see four currently listed on the inventory list), will be addressed by December 31, 2021.

Pump Station Equipment: The corrosion evident on equipment within the pump station will be addressed by January 31, 2022. Regarding separating the two chemicals, by December 31, 2021 the Company will provide an evaluation of whether and how this can be done within the existing building.

The ability and speed at which these objectives can be accomplished will be enhanced by approval of the proposed transaction as it will enable Aquarion to directly apply its resources to expediting safe and prudent solutions.

- b) See above.
- c) See above.
- d) See above.

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Omni 1-008 Attachment 1
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Hydrant #	Location	Make	Date Inspected	Type	Direction to Open (DTO)	Date Set	Hydrant Pressurized Test	Static Pressue	Hydrant Flow Test	Nozzle Inspection	Nozzles Lubricated	Additional Comments
1	Top of Rosebrook Dr. Near #23 / 9' in front of steamer, slight right	Waterous	10/14/2021	Dry	Left	1998	Pass	108	Pass	Yes	Yes	All nozzle gaskets replaced
2	Rosebrook in front of units 17-22 / in road 19' in front	Dresser 500	10/14/2021	Wet	Left		Pass	122	Pass	Yes	Yes	All nozzle gaskets replaced
3	Mountain View / Woods Rd Near # 304 / 5' in front of steamer	B-62-B	10/13/2021	Dry	Left	1999	Pass	90	Pass	Yes	Yes	
4	Mountain View / Bottom of Woods Rd, Near Unit 101 / 5'6" in front of steamer	Amer.Darling	10/13/2021	Dry	Left	1997	Pass	110	Pass	Yes	Yes	Install riser for hydrant valve
5	Rosebrook Lane in front of Unit 50	Metropolitan	10/12/2021	Dry	Left	1986	Fail	88	Pass	Yes	Yes	Bonnet seal needs to be replaced
6	29 Forest Cottage / 1' in front of steamer	USP Metro	10/20/2021	Dry	Left	1988	Fail		Pass	Yes	Yes	Bonnet seal needs to be replaced
7	Forest Cottage near #48 / 1' in front of steamer	Metropolitan	10/20/2021	Dry	Left		Fail		Pass	Yes	Yes	Bonnet seal needs to be replaced
8	9 Forest Cottage / 3' in front	USP Metro	10/20/2021	Dry	Left		Pass	130	Pass	Yes	Yes	
9	Forest Cottage / 1' directly behind	Waterous-Pacer	10/20/2021	Dry	Left	1983	Pass	120	Pass	Yes	Yes	
10	Remick Lane entrance across from Peabody Realty/ 2' 8" right	US Pipe	10/20/2021	Wet	Left	1987	Pass	150	Pass	Yes	Yes	
11	Crawford Ridge Near #6 (up hill Redish single building)/Top of Presidential Views / 10' front & slightly right of steamer	Waterous-Pacer	5/19/2021	Wet	Left	2006	Pass	160	Pass	Yes	Yes	
11A	Avalon Drive, Near Unit 13 / 16' 6" in front of steamer very slightly to the right of center	Waterous-Pacer	5/19/2021	Wet	Left	2006	Pass	145	Pass	Yes	Yes	
12	Crawford Ridge near Unit 4, across from Slope Side Lane / Presidential Views / 30' from center cap in road		10/20/2021	Wet	Left	2004	Pass	160 (gauge maxed out)	Pass	Yes	Yes	
12A	Slope Side Lane, Near Unit 10 / Presidential Views, 8' away, middle of left nozzle & steamer	Waterous-Pacer	10/21/2021	Dry	Left	2006	Pass	160 (gauge maxed out)	Pass	Yes	Yes	
13	Crawford Ridge, on right corner across from Unit 12 / 3' from Hydrant	Waterous-Pacer	10/21/2021	Wet	Left	2006	Pass	160 (gauge maxed out)	Pass	Yes	Yes	
14	Crawford Ridge, near Unit 14 / in pavement	Amer.Darling	10/21/2021	Wet	Left	2006	Pass	150	Pass	Yes	Yes	
15	Crawford Ridge just above River Edge Rd / 1' in front	B-62-B	10/21/2021	Dry	Left	1989	Pass	145	Pass	Yes	Yes	
16	Rivers Edge near generator bldg at end of cul de sac / 1' in front	B-62-B	10/21/2021	Dry	Left	1988	Pass	160 (gauge maxed out)	Pass	Yes	Yes	
17	West side of base lodge next to 15 minute parking and near Bethlehem Express / 19' in front of steamer	Waterous	10/21/2021	Wet	Left	2018	Pass	160 (gauge maxed out)	Pass	Yes	Yes	
18	Left side of Alpine Club / 4' in front of steamer	Waterous	10/21/2021	Wet	Left	2006	Pass	160 (gauge maxed out)	Pass	Yes	Yes	
19	Left side of rec center near basketball hoop / 9' in front of steamer in tar slightly left of steamer	USP Metro	10/20/2021	Dry	Left	1988/2018	Fail		Fail	No	No	Need to replace valve rod coupling (hydrant temporarily out of service)
20	Behind Rec Center near tennis courts / kitty corner from left and front nozzles	US Pipe	10/20/2021	Wet	Left	1988	Pass	140	Pass	Yes	Yes	
21	RTE 302 between Fabyans & Irving	Waterous	10/21/2021	Dry	Left	1988	Pass	160 (gauge maxed out)	Pass	Yes	Yes	
21A	Behind Drummonds MS / 8' in front of steamer	Metropolitan										
22	Entrance to Hannah Loop at MWP / 2 1/2' in front, in grass	US Pipe										
23	MWP across from Appleby / 7' in front	Waterous-Pacer	9/15/2021	Dry	Left	1988	Pass	160 (gauge maxed out)	Pass	Yes	Yes	
24	MWP Hannah Loop near MWP 19-22/ 3' in front of steamers 3' under grass	B-62-B	9/15/2021	Dry	Left	1987	Pass	135	Pass	Yes	Yes	
25	Top of Hannah Loop / 17' 6" in road in front of steamer	Waterous-Pacer	9/15/2021	Dry	Left	1999	Pass	145	Pass	Yes	Yes	
26	Abbleby Close	Amer.Darling	9/15/2021	Dry	Left		Pass	145	Pass	Yes	Yes	
27	Hannah Loop near #59 / 1/2 way between hydrant and tar	US Pipe	9/15/2021	Wet	Left	1989	Pass	125	Pass	Yes	Yes	
28	Corner of Hartford Lane & Hannah Loop / 2' in front	USP Metro	9/15/2021	Dry	Left	1987	Pass	130	Pass	Yes	Yes	
29	Corner of Dartmouth Ridge & Hannah Loop/ In pavement, front of steamer	Waterous	5/19/2021	Dry	Left	1996	Pass	130	Pass	Yes	Yes	
30	Dartmouth Ridge, end of road / Directly in front	Waterous	5/19/2021	Dry	Left	1996	Pass	125	Pass	Yes	Yes	
31	Top of Dartmouth Ridge byu traffic circle / 7' in front in pavement	Waterous	5/19/2021	Dry	Left	1996	Pass	130	Pass	Yes	Yes	

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Omni 1-008 Attachment 1
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32	Top of Dartmouth Ridge near Bode's House/ in road 18" from curb directly in front	Waterous	5/19/2021	Dry	Left	2001	Pass	125	Pass	Yes	Yes	
33	45 Hartford Lane / in pavement	Mueller	9/3/2021	Wet	Left	1987	Pass	135	Pass	Yes	Yes	
34	81 Hartford Ln / 3' in front of steamer	Mueller	9/3/2021	Wet	Left	1987	Pass	130	Pass	Yes	Yes	
35	Corner of Hartford and Abel / 3' in front of steamer	USP Metro	9/3/2021	Wet	Left	1988	Pass	125	Pass	Yes	Yes	
36	Abel Lane on hill near #132 / 4' in front of steamer	USP Metro	9/1/2021	Wet	Left	1989	Pass	120	Pass	Yes	Yes	
37	Abel Lane / 3' in front of steamer	Mueller	9/1/2021	Wet	Left	1988	Pass	120	Pass	Yes	Yes	
38	Top of Mt Adams Lane / 4' left of left nozzle - closest to road	Waterous-Pacer	9/3/2021	Wet	Left	2005	Pass	100	Pass	Yes	Yes	
39	Mt. Adams Lane near #88 / 16.5' in front of steamer	Waterous-Pacer	9/3/2021	Wet	Left	2005	Pass	115	Pass	Yes	Yes	
40	Mount Madison Townhouse at Unit 5 / 7' in front of steamer	Waterous	9/24/2021	Dry	Left	2001	Pass	110	Pass	Yes	Yes	
41	Stickney Circle across from building 10 /in road 13' in front of steamer	Amer.Darling										
42	Stickney Circle near Unit #43/in road near sewer manhole, 56' in front of steamer	B-84-B										
43	Stickney Circle / 3' in front of steamer	Waterous										
44	Fairway near Unit 45 & 46/Corner in grass	USP Metro										
45	Fairway near Unit 31 & 32/3'6 in front of steamer, 14" down, 2" to right	USP Metro										
46	Fairway Village Sand Trap Lane near 21 & 22 / front of steamer in tar	USP Metro										
47	Fairway Village near Unit 17 & 18/6' 9" in front of steamer, 1' to left	USP Metro										
48	FWV - Car Barn Court near #10 / 10' 6" in front of steamer	Mueller										
49	Fairway Village across from #1 & #2 / 5.5' in front of steamer	USP Metro										
50	MWH Bretton Arms / Closest to Hydrant	Waterous										Omni requested that inspection and flushing be done at the end of October. Hotel is currently at 100% capacity
51	Behind hotel near pump station / Front of steamer edge of road, 10' from hydrant, 5" down below grade	Waterous										Omni requested that inspection and flushing be done at the end of October. Hotel is currently at 100% capacity
52	MWH behind Carpenter Shop / Middle of road in front of steamer	Waterous										Omni requested that inspection and flushing be done at the end of October. Hotel is currently at 100% capacity
53	MWH Next to paint shop / 8' in front of steamer/inside pvc pipe	USP Metro										Omni requested that inspection and flushing be done at the end of October. Hotel is currently at 100% capacity
54	MWH Valet Parking/12' in front of steamer	Waterous										Omni requested that inspection and flushing be done at the end of October. Hotel is currently at 100% capacity
55	Across from front entrance of hotel, left west of entrance	Waterous										Omni requested that inspection and flushing be done at the end of October. Hotel is currently at 100% capacity
56	MWH near Front Entrance/3' in front of steamer, open right	Waterous										Omni requested that inspection and flushing be done at the end of October. Hotel is currently at 100% capacity
57	Farthest east behind hotel by conference center / Tennis court side fo 2.5 nozzle											Omni requested that inspection and flushing be done at the end of October. Hotel is currently at 100% capacity
58	Next to Tennis Court / 2.5' in front of steamer											Omni requested that inspection and flushing be done at the end of October. Hotel is currently at 100% capacity
59	Front of Nordic Center/Club House, Right of stone pillar lodge / 14' from sewage electric post											Omni requested that inspection and flushing be done at the end of October. Hotel is currently at 100% capacity
60	MWH behind Spa/ In sidewalk	United Fire Flow										Omni requested that inspection and flushing be done at the end of October. Hotel is currently at 100% capacity
61	Next to pump station/24' in front of steamer	USP Metro	9/22/2021	Dry	Left	2006	Pass	160	Pass	Yes	Yes	
62	By Fabayans Station/9' in front	Waterous	10/21/2021	Wet	Left	2010	Pass	160	Pass	Yes	Yes	

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Abenaki Water Company and Aquarion Company

DW 21-090

Abenaki Water Company and Aquarion Company's Responses to Omni Data Requests—Set 1

Data Request Received: October 18, 2021
Request No.: Omni 1-009

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

REQUEST: Please refer to page 71 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree with the Safety Staff Recommendations contained in paragraph #12, i.e., that associated maintenance records be required to be transferred to the new owners of the Rosebrook Water System in the event any acquisition is approved by the Commission.
- b) Please state the basis for the response to Data Request 1-009 (a), above.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 12, Abenaki agrees that associated maintenance records are available to Aquarion and will be transferred to Aquarion if the acquisition is approved by the Commission.

- b) See above.

Abenaki Water Company and Aquarion Company

DW 21-090

Abenaki Water Company and Aquarion Company's Responses to Omni Data Requests—Set 1

Data Request Received: October 18, 2021
Request No.: Omni 1-010

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

REQUEST: Please refer to page 71 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree with the Safety Staff Recommendations contained in paragraph #13, i.e., that Abenaki shall exercise or exhaust any waiver request options available from regulatory agencies prior to committing to any pressure reduction project.
- b) Please state the basis for the response to Data Request 1-010 (a), above.
- c) Please describe the steps, if any, that have been taken to comply with this recommendation.
- d) Please provide copies of all documents relating to the waiver requests referenced in Data Request 1-010(a), above.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 13, it appears based on conversations with New Hampshire Department of Environmental Services ("NHDES") staff that a blanket waiver of pressure regulations is unlikely. However, the Joint Petitioners anticipate that through the NHDES design review process, design options that provide reduction of pressure to a majority of the system and that leave pressures "as-is" may be acceptable. Design concepts that meet this criteria are currently being evaluated.

- b) See above.
- c) See above.
- d) The Joint Petitioners have no documents relating to waiver requests.

Abenaki Water Company and Aquarion Company

DW 21-090

Abenaki Water Company and Aquarion Company's Responses to Omni Data Requests—Set 1

Data Request Received: October 18, 2021
Request No.: Omni 1-011

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

REQUEST: Please refer to page 71 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree with the Safety Staff Recommendations contained in paragraph #14, i.e., that Abenaki shall investigate what types of pressure reduction modifications would be supported by regulatory agencies to improve system pressures, but in no event to include complete reductions below levels of 100 psig or maintenance of system pressure levels at the regulatory maximum pressure level. Various scenarios should be presented along with cost estimates, consideration of customer impacts, and anticipated benefits of partial reduction. See Element #4, Item 2 and Item 3 of the Investigation Report.
- b) Please state the basis for the response to Data Request 1-011 (a), above.
- c) Please describe the steps, if any, that have been taken to comply with this recommendation.
- d) Please provide copies of all documents relating to the investigations referenced in Data Request 1-011 (a), above.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 14, the Joint Petitioners are interpreting this recommendation to mean that consideration should be given to options that would address high pressures in some portions of the system, but result in pressures higher than the regulatory maximum in others areas of the system, to the extent that such changes can be accomplished in a safe, reliable, and sustainable manner. Preliminary design work for these types of options has been completed, and the Joint Petitioners intend to provide cost estimates, customer impacts, and benefits of all such options. The ability and speed at which these objectives can be accomplished will be enhanced by approval of the proposed transaction as it will enable Aquarion to directly apply its resources to expediting safe and prudent solutions.

Abenaki Water Company and Aquarion Company

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Abenaki Water Company and Aquarion Company's Responses to Omni Data Requests—Set 1

Data Request Received: October 18, 2021
Request No.: Omni 1-011

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

-
- b) See above.
 - c) See above.
 - d) See Omni 1-011 Attachment 1.



**UPDATED SYSTEM EVALUATION
FOR PRESSURE REDUCTION
Rosebrook Water System
Bretton Woods, New Hampshire**



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**UPDATED SYSTEM EVALUATION FOR PRESSURE REDUCTION
ROSEBROOK WATER SYSTEM
BRETTON WOODS, NEW HAMPSHIRE
FOR
ABENAKI WATER COMPANY
PLAINVILLE, CT**

**MAY 2021
(LAST UPDATED JUNE 22, 2021)**

**Project No. 21008
Horizons Engineering, Inc.**

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System Overview/Components

The Abenaki Water Company, care of New England Service Company, operates the Rosebrook Water System (PWS ID 0382010) to provide domestic water supply and fire hydrant/sprinkler suppression to users in Bretton Woods, New Hampshire. The system serves the Mount Washington Hotel and Bretton Woods Ski Resort complex as well as single and multi-family residential and small commercial customers within the service area. The Rosebrook Water System is designated by the New Hampshire Department of Environmental Services (NHDES) as a Large Community Water System (a public water system serving a population greater than 1,000 or providing flow for fire suppression). NHDES records indicate the system serves a population of approximately 1,050 through 408 services connections. Major system components include two gravel packed production wells, a pump house, a 650,000-gallon atmospheric storage tank, and distribution piping and appurtenances.

Wells and Well Field

The system has two sand and gravel production wells located to the north of the Bretton Woods Base Lodge and to the south of Drummond Mountain Shop on Route 302.

Well #1 is a 43 foot deep gravel-packed production well with a reported yield of 322 gallons per minute and a static water level of approximately 6 feet below ground surface. Well #1 was installed in 1970 during the original construction of the water system and is located inside the pump station building. Currently Well #1 is equipped with an American Industrial 50 horsepower 10-stage vertical turbine pump. This pump has a reported pumping capacity of approximately 325 gallons per minute. As Well #1 was installed prior to adoption of NHDES Groundwater Withdrawal Rules Env-Ws 379 and 388, this well has not been assigned a permitted production volume.

Well #2 is a 52 foot deep gravel packed production well with a reported yield of 450 gallons per minute. The well is located approximately 90 feet to the southeast of the pump station. Well #2 was installed in the 1990s and received NHDES Conditional Approval in July of 2003. The well is currently equipped with a Goulds 60 horsepower, 480-volt, 3-phase pump set at 30 feet, with an estimated pumping capacity of 425 gallons per minute. NHDES has assigned Well #2 a daily permitted production volume of 540,000 gallons (375 gallons per minute based on continuous pumping).

Pump Station

The Rosebrook pump station consists of a single-story metal-framed building constructed on a concrete slab. The building is in fair condition, having been refurbished after a piping failure and flooding incident in 2008. The pump station does not contain any booster pumps or hydropneumatic storage. The well pumps are configured to operate based on water level in the atmospheric storage tank. These pumps provide the sole source of head for the system. The pump station building houses the Well #1 well head and drive motor along with a chemical feed pumps for water treatment, system controls and alarms for both wells, and various tools, spare parts, and supplies.

Atmospheric Storage Tank

Atmospheric storage consists of a single partially buried cast in place concrete storage tank with a metal truss roof, constructed in the early 1970s. The tank is ninety feet in diameter and has a capacity of 650,000 gallons. The tank is located within the Bretton Woods Ski Area at an approximate elevation of 2,010 feet. Within the last 15 years the tank has undergone repairs to address deterioration of the roof, including installation of a new roof covering system of polystyrene insulation and EPDM membrane in 2012.

Distribution System

The system consists primarily of cement-lined Ductile Iron and C900 PVC water mains. The system contains a total of approximately 32,600 feet of water main. Service connections consist primarily of type "K" copper with brass fittings. System pressures reportedly range from 50 to 190 pounds per square inch. Service connections at lower elevations are equipped with individual pressure reducing valves. The system is equipped with fire hydrants for fire suppression and water mains are adequately sized to provide fire flow. Some of the gate valves in the system are inoperable.

System Domestic Use Demands

Pumping records are maintained for the two water supply wells. Average daily demand over the 2015 calendar year was approximately 110,000 gallons. The peak month was January with an average daily demand of 131,616 gallons and a peak pumping day of 279,900 gallons on January 31, 2015. System demands for 2017 through March of 2021 are as follows:

2017	99,600 gallons per day
2018	119,800 gallons per day
2019	108,750 gallons per day
2020	91,430 gallons per day
2021	115,810 gallons per day

System Pressures

Due to the significant grade differential between the lower service areas and the operating level of the atmospheric storage tank, parts of the Rosebrook system have high static and working pressures. As noted earlier, the storage tank is located at elevation 2010+/- . Elevations along Route 302 and the Base Road near the intersection with Route 302 are approximately 1,575, resulting in static water system pressures in excess of 190 psi.

If system pressures can be effectively reduced, it may result in a system that is safer to operate, some operation and maintenance and pumping costs will be reduced, there will be less reliance on individual service pressure reducing valves (PRVs) for system control, and system leakage may be reduced.

Existing System Piping Flows/Hydraulic Modeling

On May 13, 2021 fire hydrant flow testing was performed in order to determine/confirm the flow characteristics of the existing system piping. Two different pressure gauges were used to confirm gauge accuracy before actual testing commenced. Three separate fire hydrant flow test diffusers were installed on the first hydrant in order to compare flow rates from each device. The newest flow test diffuser was selected for use as it provided a reasonable average of the three devices.

The hydrant flow testing showed that the existing piping network has a very high capacity to deliver water to all parts of the system, including the higher elevations of the system. This ability to deliver water is a function of the adequate size and interior condition of the water mains and the elevation of the existing storage tank in relation to the hydrant locations. Based upon the hydrant flow testing, a pipe roughness coefficient C-value of 140 for cement lined Ductile Iron pipe and 150 for PVC pipe was determined to be appropriate and therefore utilized in the hydraulic modeling. Flow modeling assumed that a minimum residual pressure of 35 psi be maintained/provided at all locations in the system.

Available pipe water flows for the following locations are highlighted:

Hannah Loop (highest elevation, node J-64)	2,766 gpm
Dartmouth Ridge Homes (highest elevation, node J-66)	2,265 gpm
Crawford Ridge – Presidential Views (highest elevation, node J-19)	2,289 gpm
Rosebrook Townhomes (highest elevation, node J-31)	3,689 gpm
Mount Washington Hotel (node J-98)	1,990 gpm
Bretton Woods Base Lodge (node J-20)	9,070 gpm
Fairway Village (node J-88)	7,399 gpm

It is noted that water hammer was observed during fire flow testing on the north side of Route 302. Water hammer at the higher elevation locations was observed to be 10-12 psi and water hammer at the Mount Washington Hotel was observed to be 16 to 18 psi.

A copy of the modeling Plan and data output showing available flows at all junction nodes of the system can be found in Appendix B.

NHDES Letter of Deficiency DWGB 20-032

On December 1, 2020 the Abenaki Water Company received a Letter of Deficiency DWGB 20-032 (LOD) from the New Hampshire Department of Environmental Services. The LOD states that the Rosebrook Water System shall be modified such that the maximum normal working pressure is between 60 psi and 90 psi with a minimum working pressure of 35 psi at ground level under all conditions and a 100 psi maximum static pressure for the system. The LOD made reference to the “Recommended Standards for Water Works” as justification for the required pressure reduction.

Conceptual Improvements Options for Pressure Reduction

Three overall concepts have been considered for full and/or partial pressure reduction. The Overall Plan found in Appendix A generally shows the location of the proposed options infrastructure:

OPTION 1A assumes that the system will continue to utilize the existing 650,000 gallon water storage tank located at elevation 2,010 feet and that the existing pump station at the well site remains in use for chemical storage and injection. Under this option the well pumps will be replaced with pumps that provide the same outflow at a discharge pressure of 90 psi, and that new booster pump stations will be installed to fill the existing tank and provide service to the higher system users. A pressure reducing valve structure will be installed to allow water from the existing tank to flow back into the lower pressure zone.

OPTION 1B assumes that the system will continue to utilize the existing 650,000 gallon water storage tank located at elevation 2,010 feet and that a new pump station will be installed at the well site. Under this option the well pumps will provide the same outflow to the system but will pump into a 10,000 gallon +/- tank at the well site. Chemical injection will take place under low pressure when a well pump is filling the 10,000 gallon +/- tank. New booster pumps will draw water out of the 10,000 gallon +/- tank, pumping at the same rate of flow from the well pump(s) at a discharge pressure of 90 psi, and that new booster pump stations will be installed to fill the existing tank and provide service to the higher system users. A pressure reducing valve structure will be installed to allow water from the existing tank to flow back into the lower pressure zone.

OPTION 1C assumes that the system will continue to utilize the existing 650,000 gallon water storage tank located at elevation 2,010 feet and that a new pump station will be installed at the well site. Under this option the well pumps will provide the same flow to the system but will pump into a 10,000 gallon +/- tank at the well site. Chemical injection will take place under low pressure when a well pump is filling the 10,000 gallon +/- tank. New booster pumps will draw water out of the 10,000 gallon +/- tank, pumping at the same rate of flow from the well pump at a discharge pressure of approximately 190 psi to fill the existing storage tank without the need for new booster pump stations or pressure reducing valve structure (ie. pressure reduction to take place only for chemical injection piping).

OPTION 1D assumes that the system will continue to utilize the existing 650,000 gallon water storage tank located at elevation 2,010 feet and that a new pump station will be installed at the well site. Under this option the well pumps will provide the same flow to the system but will pump into a 10,000 gallon +/- tank at the well site. Chemical injection will take place under low pressure when a well pump is filling the 10,000 gallon +/- tank. New booster pumps will draw water out of the 10,000 gallon +/- tank, pumping at the same rate of flow from the well pump at a discharge pressure of approximately 190 psi to fill the existing storage tank without the need for new booster pump stations. Multiple pressure reduction valve structures will be installed throughout the system to reduce pressure in the various legs of the distribution system. High pressure will remain in the 16 inch water main to the existing storage tank and also along Base Road. The existing 8 inch water main to the Mount Washington Hotel will also be kept under current high pressure in order to maintain the existing fire hydrant/sprinkler flows.

OPTION 2A assumes that the existing water storage tank is replaced with a new 750,000 gallon water storage tank located at the existing well site. Under this option the well pumps will provide the same outflow to the system but will pump into the 750,000 gallon tank at the well site. Chemical injection will take place under low pressure when a well pump is filling the tank. New variable speed booster pumps at the well site will draw water out of the tank, pumping at the needed flow rate to serve the system at a discharge pressure of 90 psi, and new booster pump stations will be installed to service to the higher system users. A pressure reducing valve structure will not be needed under this option.

OPTION 2B assumes that the existing water storage tank is replaced with a new 750,000 gallon water storage tank located at the existing well site. Under this option the well pumps will provide the same outflow to the system but will pump into the 750,000 gallon tank at the well site. Chemical injection will take place under low pressure when a well pump is filling the tank. New variable speed booster pumps at the well site will draw water out of the tank, pumping at the needed flow rate to serve the system at a discharge pressure of approximately 140 psi. Additional booster pump stations and pressure reducing valve structure will not be needed under this option.

OPTION 3A assumes that the existing water storage tank is replaced with a new 750,000 gallon water storage tank located on the north side of Route 302. Under this option the well pumps will be replaced with pumps that provide the same outflow at a discharge pressure of 90 psi to fill the new tank, and that new booster pump stations will be installed to service to the higher system users. A pressure reducing valve structure will not be needed under this option.

OPTION 1A

This Option maintains key components of the existing system such as the two gravel production wells, the existing pump station building, the transmission and distribution mains, and the 650,000 gallon atmospheric storage tank in the present locations. The key components of the improvements are outlined as follows:

- Replace existing well pumps in Well #1 and Well #2 with two new well pumps capable of the same flow rates (325 gpm for Well #1 and 425 gpm for Well #2) at a discharge pressure of 90 psi. This will reduce the system pressure at the pump station from approximately 190 psi to 90 psi. The well pumps will continue to be controlled by the water level(s) in the 650,000 gallon atmospheric storage tank.
- Install a new combined Rosebrook Booster Pump Station and Pressure Reducing Valve Structure in the vicinity of the existing 16 inch Ductile Iron pipe off of Rosebrook Lane on property owned by Omni/Rosebrook Townhomes Association. This pump station will be utilized to boost water flow/pressure from the well pump(s) to fill the existing storage tank. This pump station will have a slab elevation of approximately 1,700 feet. With an outlet pressure at the existing well pump(s) of 90 psi, this pump station will have an inlet pressure of approximately 35 psi and an outlet pressure of approximately 135 psi. This station will be outfitted with variable speed pumps that will operate in conjunction with the well pump to fill the tank with excess flow from the well pump in operation (pump outflow minus usage at the time of pump operation). This station will not need to provide fire flows, as fire flows for this area will continue to be delivered by the existing water storage tank. This pump station will have a maximum capacity of 425 gpm to match the design output of Well #2. Provisions for stand-by power (emergency generator) will need to be provided at this pump station. This pump station, as well as the well pump, would be controlled by water level in the existing atmospheric storage tank and would start and stop in conjunction with the well pump. The PRV structure will allow/throttle water flow from the existing tank back into the lower pressure zone. This PRV structure will need to operate under very low flow conditions and also high fire flow conditions. This PRV structure will need to be configured such that water hammer conditions are prevented/minimized. This PVR structure will have an inlet pressure of approximately 135 psi and an outlet pressure of approximately 35 psi.
- Install a new Crawford Ridge Booster Pump Station off of Crawford Ridge Drive on property owned by the Crawford Ridge Property Owners Association (at overflow parking area). This pump station will be utilized to boost water flow/pressure from the existing 12 inch water main on Crawford Ridge Drive. This booster pump station will have a slab elevation of approximately 1,670 feet. This pump station will have an inlet pressure of 50 psi and an outlet pressure 106 psi. This station will be outfitted with variable speed pumps drawing water from the storage tank and/or the existing well pump(s). This station will need to provide both domestic and fire hydrant flow to its service area. Provisions for stand-by power (emergency generator) will need to be provided at this pump station. This pump station will operate to maintain a constant outlet pressure of 35 psi minimum at ground level at the highest user in this area.

- Install a new Mount Washington Place Booster Pump Station off of Hartford Lane on property owned by the Mount Washington Place Owners Association (at intersection of Hartford Lane and Hannah Loop). This pump station will be utilized to boost water flow/pressure from the existing 16 inch water main on Hannah Loop. This booster pump station will have a slab elevation of approximately 1,670 feet. This pump station will have an inlet pressure approximately of 50 psi and an outlet pressure of approximately 78 psi. This station will be outfitted with variable speed pumps drawing water from the storage tank and/or the existing well pump(s). This station will need to provide fire hydrant flows to its service area. Provisions for stand-by power (emergency generator) will need to be provided at this pump station. This pump station will operate to maintain a constant outlet pressure of 35 psi minimum at ground level at the highest user in this area.

Estimated Cost for OPTION 1A

Well Pump Replacement	\$80,000
SCADA and Control Upgrade	\$60,000
Chemical Feed/Storage Improvements	\$30,000
Rosebrook Pump Station/PRV	\$500,000
Crawford Ridge Booster Pump Station	\$900,000
Mount Washington Booster Pump Station	\$900,000
Subtotal – Construction Cost	\$2,470,000
15% Contingency	\$370,000
Subtotal – Construction Cost with Contingency	\$2,840,000
Land/Easement	\$200,000
Engineering @ 10% of Construction Cost	\$247,000
Total	\$3,287,000

OPTION 1B

This Option is similar to OPTION 1A except that the well pumps will pump into a 10,000 gallon +/- tank at the well site where chemical injection will take place and that a new pump station will be installed at the well site. Treated water will be pump into the system by new variable speed pumps in the new pump station drawing water from this 10,000 gallon +/- tank. The outlet pressure into the system from this pump station will 90 psi. The key components of the improvements are outlined as follows:

- Replace existing well pumps in Well #1 and Well #2 with two new well pumps capable of the same flow rates (325 gpm for Well #1 and 425 gpm for Well #2) at a discharge pressure of 20 psi. This will reduce the pressure for the chemical injection system from 190 psi to 20 psi. Install a 10,000 gallon +/- tank at the well site into which the treated well water will flow. Install a new pump station at the well site that will house the chemicals and chemical injection equipment as well as new variable speed pumps that will discharge into the system at 90 psi. The well pumps and booster pumps will continue to be controlled by the water level(s) in the 650,000 gallon atmospheric storage tank.
- Install a new combination Rosebrook Booster Pump Station and Pressure Reducing Valve Structure, a new Crawford Ridge Booster Pump Station, and a new Mount Washington Place Booster Pump Station as previously described.

Estimated Cost for OPTION 1B

Well Pump Replacement	\$60,000
SCADA and Control Upgrade	\$60,000
Well Site Pump Station	\$700,000
Rosebrook Pump Station/PRV	\$500,000
Crawford Ridge Booster Pump Station	\$900,000
Mount Washington Booster Pump Station	\$900,000
Subtotal – Construction Cost	\$3,120,000
<u>15% Contingency</u>	<u>\$468,000</u>
Subtotal – Construction Cost with Contingency	\$3,588,000
Land/Easement	\$200,000
<u>Engineering @ 10% of Construction Cost</u>	<u>312,000</u>
Total	\$4,100,000

OPTION 1C

This Option is similar to OPTION 1B except that the treated water from the 10,000 gallon +/- tank will be pump into the system by variable speed pumps with an outlet pressure into the system of 190 psi to fill the existing storage tank without the need for new booster pump stations (ie. pressure reduction to take place only for chemical injection piping). This option includes a new pump station installed at the well site. The well pumps and booster pumps will continue to be controlled by the water level(s) in the 650,000 gallon atmospheric storage tank. The key components of the improvements are outlined as follows:

- Replace existing well pumps in Well #1 and Well #2 with two new well pumps capable of the same flow rates (325 gpm for Well #1 and 425 gpm for Well #2) at a discharge pressure of 20 psi. This will reduce the pressure for the chemical injection system from 190 psi to 20 psi. Install a 10,000 gallon +/- tank at the well site into which the treated well water will flow. Install a new pump station at the well site that will house the chemicals and chemical injection equipment as well as new variable speed pumps that will discharge into the system at 190 psi. The well pumps and booster pumps will continue to be controlled by the water level(s) in the 650,000 gallon atmospheric storage tank.

Estimated Cost for OPTION 1C

Well Pump Replacement	\$60,000
SCADA and Control Upgrade	\$60,000
Well Site Pump Station	\$900,000
Subtotal – Construction Cost	\$1,020,000
15% Contingency	\$153,000
Subtotal – Construction Cost with Contingency	\$1,173,000
Engineering @ 10% of Construction Cost	102,000
Total	\$1,275,000

OPTION 1D

This Option is similar to OPTION 1C except that multiple pressure reducing valve structures will be installed throughout the system to reduce pressure in the various legs of the system. Under this option the 16 inch water main to the tank will operate under current pressure conditions as will the 16 inch water main located along Base Road, and also the 8 inch water main feeding the Mount Washington Hotel.

PRV1 will be installed to reduce pressure to Rivers Edge, Crawford Ridge, and the Presidential Views areas. PRV2, 3 and 4 will be installed to reduce pressure to the Forest Cottages, Rosebrook Townhomes, and the Mountain View areas. PRV5 will be installed to reduce pressure to the Mount Washington Place, Mount Washington Homes, and the Dartmouth Ridge Homes areas. And PRV6 will be installed to reduce pressure to the Stickney Circle and the Fairway Village areas. The Conceptual System Improvements for Pressure Reduction, Alternative 1D Overall Plan, found in Appendix A, shows the approximate locations, elevations, and inlet/outlet pressures for the noted PRV's.

As previously noted, the 8 inch water main along Base Road that feeds the Mount Washington Hotel will remain at its current pressure so that existing fire hydrant and sprinkler flow and pressure is not changed.

These six PRV structures will be located on main line piping that feeds existing fire hydrants. As such, the structures will be configured to pass high volume flows in order to approximately maintain existing fire hydrant flows. If found to be needed, additional "low volume" PRV structures could be installed on individual service line(s) at the point of service connection onto the main line piping.

Estimated Cost for OPTION 1D

Well Pump Replacement	\$60,000
SCADA and Control Upgrade	\$60,000
Well Site Pump Station	\$900,000
Main Line PRV structures, 6 @ \$160,000	\$960,000
<u>Service Line PRV structures, 6 @ \$50,000</u>	<u>\$300,000</u>
Subtotal – Construction Cost	\$2,280,000
<u>15% Contingency</u>	<u>\$342,000</u>
Subtotal – Construction Cost with Contingency	\$2,622,000
<u>Engineering @ 10% of Construction Cost</u>	<u>228,000</u>
Total	\$2,850,000

OPTION 2A

This option assumes that the existing water storage tank is replaced with a new 750,000 gallon water storage tank located at the existing well site and that a new pump station will also be installed at the well site.. Under this option the well pumps will provide the same outflow to the system but will pump into the 750,000 gallon tank at the well site. Chemical injection will take place under low pressure when a well pump is filling the tank. New variable speed booster pumps at the well site will draw water out of the tank, pumping at the needed flow rate to serve the system at a discharge pressure of 90 psi, and new booster pump stations will be installed to service to the higher system users. A pressure reducing valve structure will not be needed under this option. The Rosebrook Pump Station will need to provide fire flows under this option.

Estimated Cost for OPTION 2A

Well Pump Replacement	\$60,000
SCADA and Control Upgrade	\$60,000
Well Site Pump Station	\$900,000
750,000 Gallon Water Storage Tank	\$1,350,000
Rosebrook Pump Station	\$900,000
Crawford Ridge Booster Pump Station	\$900,000
<u>Mount Washington Booster Pump Station</u>	<u>\$900,000</u>
Subtotal – Construction Cost	\$5,070,000
<u>15% Contingency</u>	<u>\$760,000</u>
Subtotal – Construction Cost with Contingency	\$5,830,000
Land/Easement	\$200,000
<u>Engineering @ 10% of Construction Cost</u>	<u>\$507,000</u>
Total	\$6,537,000

OPTION 2B

This option assumes that the existing water storage tank is replaced with a new 750,000 gallon water storage tank located at the existing well site and that a new pump station will be installed at the well site. Under this option the well pumps will provide the same outflow to the system but will pump into the 750,000 gallon tank at the well site. Chemical injection will take place under low pressure when a well pump is filling the tank. New variable speed booster pumps at the new well site pump station will draw water out of the tank, pumping at the needed flow rate to serve the system at a discharge pressure of approximately 150 psi. No additional booster pump stations or PRV structure will be needed. Under this option the outlet pressure of the well site pump station will be reduced from 190 psi to approximately 150 psi to service the highest user in the system with 35 psi minimum at the service elevation.

Estimated Cost for OPTION 2B

Well Pump Replacement	\$60,000
SCADA and Control Upgrade	\$60,000
Well Site Pump Station	\$1,200,000
<u>750,000 Gallon Water Storage Tank</u>	<u>\$1,350,000</u>
Subtotal – Construction Cost	\$2,670,000
<u>15% Contingency</u>	<u>\$400,000</u>
Subtotal – Construction Cost with Contingency	\$3,070,000
<u>Engineering @ 10% of Construction Cost</u>	<u>\$267,000</u>
Total	\$3,337,000

OPTION 3A

This option assumes that the existing water storage tank is replaced with a new 750,000 gallon water storage tank located on the north side of Route 302 and that a new pump station will be installed at the well site. Under this option the well pumps will provide the same outflow to the system but will pump into a 10,000 gallon +/- tank at the well site. Chemical injection will take place under low pressure when a well pump is filling the 10,000 gallon +/- tank. New booster pumps will draw water out of the 10,000 gallon +/- tank, pumping at the same rate of flow from the well pump(s) at a discharge pressure of 90 psi to fill the new tank and new booster pump stations will be installed to service to the higher system users. A pressure reducing valve structure will not be needed under this option. The Rosebrook Booster Pump Station will need to provide fire flow for this option

Estimated Cost for OPTION 3A

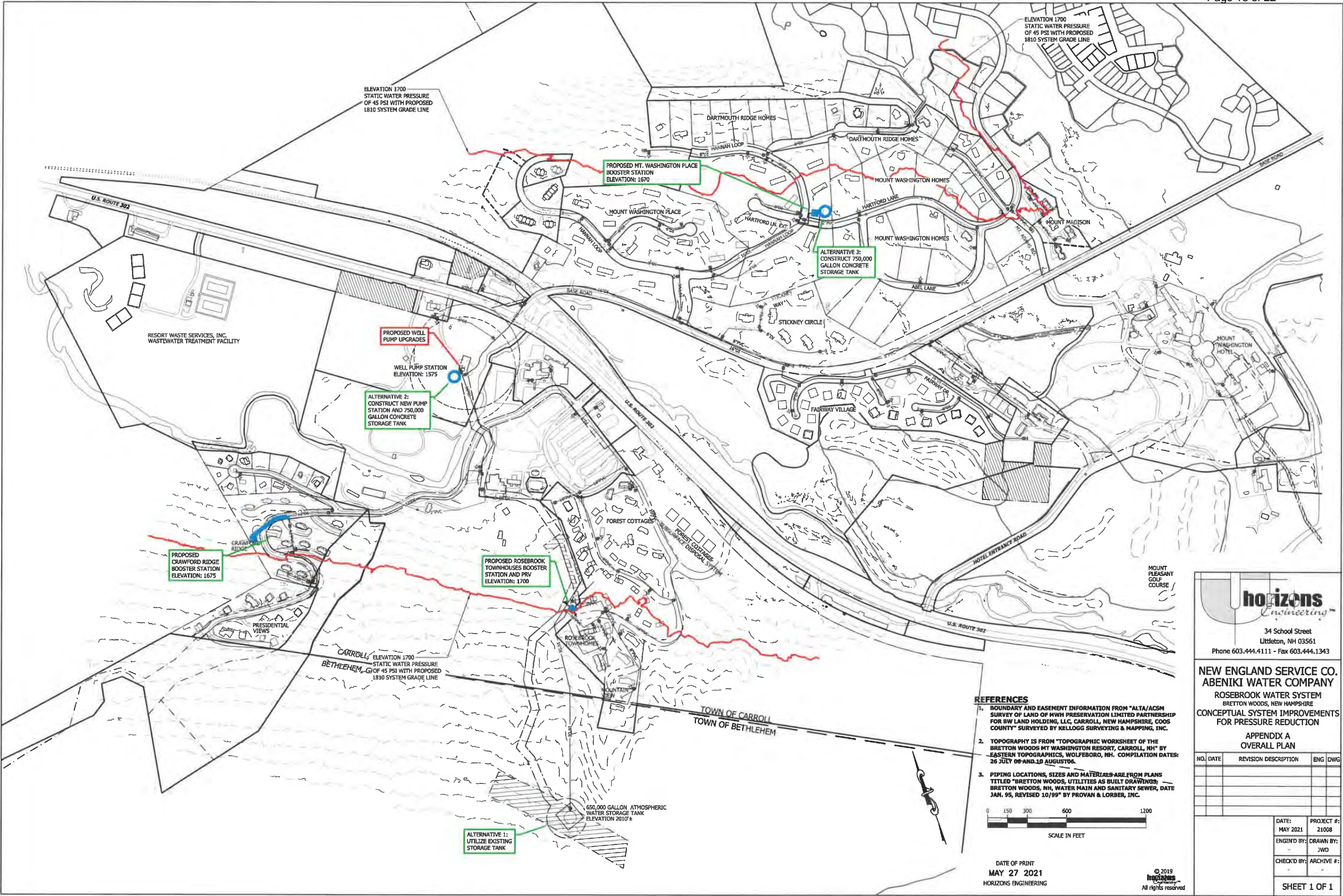
Well Pump Replacement	\$60,000
SCADA and Control Upgrade	\$60,000
Well Site Pump Station	\$700,000
750,000 Gallon Water Storage Tank	\$1,350,000
Rosebrook Pump Station	\$900,000
Crawford Ridge Booster Pump Station	\$900,000
<u>Mount Washington Booster Pump Station</u>	<u>\$900,000</u>
Subtotal – Construction Cost	\$4,870,000
<u>15% Contingency</u>	<u>\$730,000</u>
Subtotal – Construction Cost with Contingency	\$5,600,000
Land/Easement	\$250,000
<u>Engineering @ 10% of Construction Cost</u>	<u>\$487,000</u>
Total	\$6,337,000

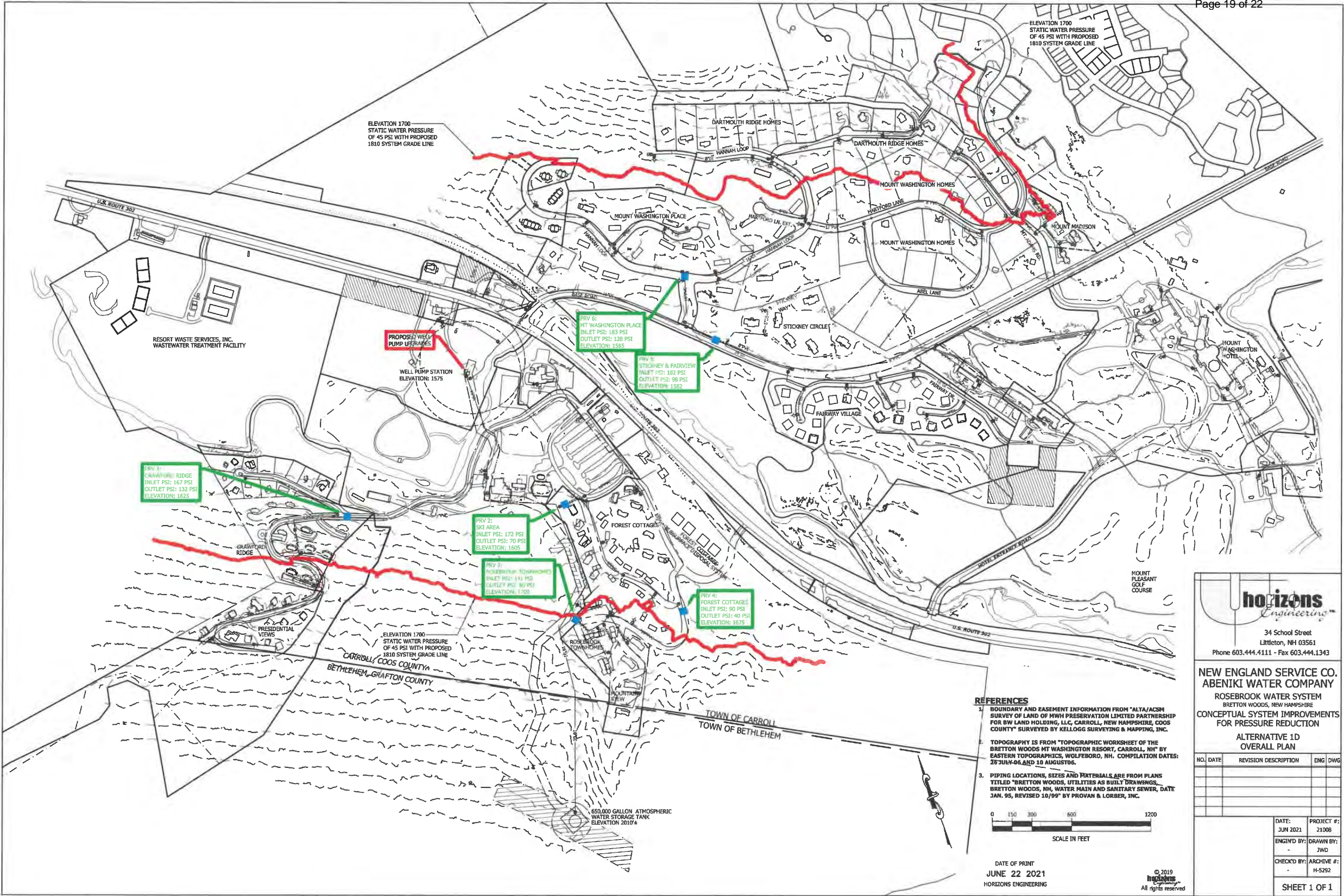
Summary Findings

- The Rosebrook Water System operates in excess of “recommended” pressure limits.
- The Rosebrook Water System has operated under these same conditions for approximately 50 years.
- Other public water systems in New Hampshire operate under similar pressure conditions.
- Pressure reduction will significantly reduce existing fire flows in the lower pressure zone.
- Existing fire flows in the lower elevation of the system are likely much greater than Needed Fire Flows (with the likely exception of the Mount Washington Hotel).
- Existing fire flows in the upper elevation of the system likely currently meet Needed Fire Flows.
- A Needed Fire Flow evaluation should be completed site wide for final design.
- Pressure reduction will reduce domestic water flow/pressure at properties at the higher system elevations. Some high value structures are up to 40 feet above the water service location at ground level and are three stories in height. A static pressure of 35 psi at the ground level of the service may not provide satisfactory pressure for the user.
- Pressure reduction may result in added liability to all parties involved in the project.
- Pressure reduction will improve operator safety at the existing pump station.
- Pressure reduction will improve operation and maintenance of the chemical injection system.
- Above grade piping within the existing pump station is believed to present the greatest hazard potential for the system operator.
- The existing pump station equipment is aged and will need to be upgraded within a relatively short period of time. The existing pump station was not designed for chemical storage and addition to the system.
- Chemical storage within the existing pump station creates a corrosive environment which will accelerate the deterioration of the existing equipment and piping within the building.
- Water hammer currently exists in the system on the north side of Route 302. This water hammer exasperates the high-pressure situation and should be addressed. One potential option to address this situation is the extension of the existing 16 inch water main at Fairway Village to the Mount Washington Hotel as has been previously identified.
- Piping and appurtenances in the system appear to be appropriately rated for the existing system pressures.
- Inoperable valves in the system will not be “fixed” by pressure reduction and should be replaced. Approximately 6 valves, in key system locations, are believed to be inoperable.

APPENDIX A

CONCEPTUAL IMPROVEMENTS OVERALL PLAN CONCEPTUAL IMPROVEMENTS OPTION 1D





APPENDIX B

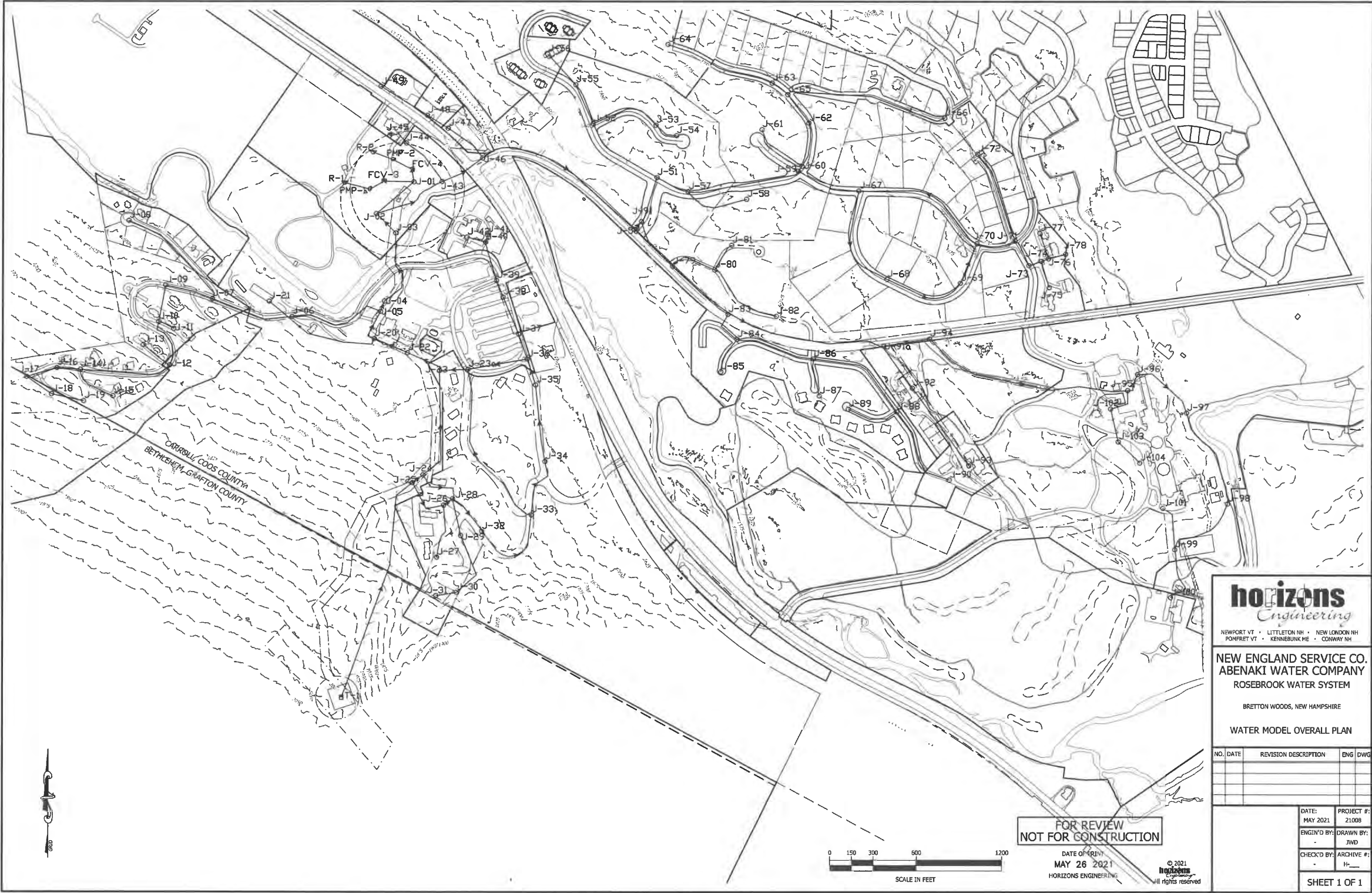
ROSEBROOK HYDRAULIC MODELING PLAN AND DATA OUTPUT

DW 21-090
Exhibit 31

DW 21-090
Omni 1-011 Attachment 1
Page 21 of 22

ROSEBROOK WATER SYSTEM
HYDRAULIC MODEL DATA
C-VALUES: DUCTILE IRON C=140, PVC C=150

Node Label	Available Flow (gpm)	Minimum Pressure (psi)	Calculated Pressure (psi)	Node Label	Available Flow (gpm)	Minimum Pressure (psi)	Calculated Pressure (psi)
J-01	4,135	35	35	J-55	4,271	35	48
J-02	8,672	35	131	J-56	3,771	35	35
J-03	8,672	35	145	J-57	7,029	35	119
J-04	8,672	35	141	J-59	6,609	35	87
J-05	8,672	35	142	J-60	6,525	35	85
J-06	6,105	35	140	J-61	3,088	35	35
J-07	5,068	35	127	J-62	4,241	35	70
J-08	4,943	35	35	J-63	3,489	35	49
J-09	4,657	35	118	J-64	2,766	35	35
J-10	4,430	35	94	J-65	3,489	35	59
J-12	4,162	35	75	J-66	2,265	35	35
J-14	3,734	35	51	J-67	6,609	35	76
J-15	3,306	35	35	J-68	5,621	35	64
J-16	3,643	35	47	J-69	5,046	35	58
J-17	3,001	35	35	J-70	4,775	35	57
J-18	2,408	35	35	J-71	3,987	35	55
J-19	2,289	35	35	J-72	3,001	35	35
J-20	9,070	35	138	J-73	3,987	35	44
J-22	9,552	35	136	J-74	3,927	35	35
J-23	10,000	35	134	J-75	3,726	35	35
J-23a	10,000	35	121	J-76	3,837	35	35
J-24	10,000	35	107	J-77	3,569	35	35
J-25	10,000	35	104	J-78	3,829	35	35
J-26	10,000	35	72	J-79	7,399	35	121
J-27	3,088	35	35	J-80	3,810	35	40
J-28	10,000	35	71	J-81	3,071	35	35
J-29	7,735	35	59	J-82	2,347	35	35
J-30	4,086	35	37	J-83	7,399	35	111
J-31	3,689	35	35	J-84	7,399	35	113
J-32	10,000	35	57	J-85	7,399	35	42
J-33	10,000	35	71	J-86	7,399	35	99
J-34	10,000	35	73	J-87	7,180	35	35
J-35	10,000	35	88	J-88	7,399	35	98
J-36	10,000	35	95	J-89	6,470	35	35
J-37	7,834	35	71	J-90	7,399	35	92
J-38	6,792	35	35	J-91	7,356	35	128
J-39	6,207	35	35	J-91a	3,159	35	50
J-40	5,264	35	35	J-92	2,618	35	35
J-41	5,119	35	35	J-93	1,989	35	35
J-42	4,179	35	35	J-94	2,939	35	41
J-43	8,672	35	133	J-95	2,300	35	38
J-44	7,559	35	37	J-96	2,277	35	35
J-45	6,606	35	35	J-97	2,150	35	46
J-46	8,419	35	126	J-98	1,990	35	46
J-47	7,834	35	47	J-99	1,892	35	50
J-48	7,048	35	35	J-100	1,892	35	48
J-49	5,569	35	35	J-101	1,838	35	35
J-50	7,399	35	128	J-102	2,236	35	37
J-51	7,172	35	124	J-103	2,173	35	37
J-52	5,048	35	50	J-104	2,120	35	35
J-53	4,131	35	35				



Abenaki Water Company and Aquarion Company

DW 21-090

Abenaki Water Company and Aquarion Water Company's Responses to Omni Data Requests—
Set 1

Data Request Received: October 18, 2021
Request No.: Omni 1-012

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

REQUEST: Please refer to page 71 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree with the Safety Staff Recommendations contained in paragraph #15, i.e., that Abenaki shall evaluate and explore further the Pros and Cons of Element #4, Item 2 and Item 3 of the Investigation Report, and present its findings to the Department of Energy and the Commission.
- b) Please state the basis for the response to Data Request 1-012 (a), above.
- c) Please describe the steps, if any, that have been taken to comply with this recommendation.
- d) Please provide copies of all documents relating to the evaluation referenced in Data Request 1-012(a), above.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 15, and consistent with the response to Omni 1-011, the Joint Petitioners will evaluate all options.

- b) See above.
- c) See above.
- d) See above.

Abenaki Water Company and Aquarion Company

DW 21-090

Abenaki Water Company and Aquarion Company's Responses to Omni Data Requests—Set 1

Data Request Received: October 18, 2021
Request No.: Omni 1-013

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

REQUEST: Please refer to page 71 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree with the Safety Staff Recommendations contained in paragraph #16, i.e., that Abenaki shall clearly delineate any and all facility equipment and pipeline components that should have been either repaired and/or replaced to ensure safe and reliable service exclusive of the pressure reduction project, see Element #4, Item 4 of the Investigation Report, and that maintenance and replacement of valves will neither be delayed nor subsumed into the proposed pressure reduction project, especially when these valves are critical to daily system safety and operation.
- b) Please state the basis for the response to Data Request 1-013 (a), above.
- c) Please describe the steps, if any, that have been taken to comply with this recommendation.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 16, the Joint Petitioners agree with this recommendation. For additional information, refer to the response to Omni 1-008.

- b) See above.
- c) See above.

Abenaki Water Company and Aquarion Company

DW 21-090

Abenaki Water Company and Aquarion Company's Responses to Omni Data Requests—Set 1

Data Request Received: October 18, 2021
Request No.: Omni 1-014

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

REQUEST: Please refer to page 71 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree with the Safety Staff Recommendations contained in paragraph #17, i.e. that Abenaki shall include in any design proposals all cost estimates for long-term maintenance and operational expenses for proposed components such as new booster pump stations and generators. Examples may include monthly utility bills of electrical services to provide power for the booster pump stations, fuel supplies for emergency generators, and cyclical maintenance and inspection of booster pump stations, generators, and pressure reducing devices. This cost analysis process should also include the costs associated with the replacement of proposed equipment such as a booster pump or generator, along with the costs associated with snow removal to access these components. See Element #4, Item 5 and Item 6 of the Investigation Report.
- b) Please state the basis for the response to Data Request 1-014 (a), above.
- c) Please describe the steps, if any, that have been taken to comply with this recommendation.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 17, the Joint Petitioners agree that the evaluation of alternative solutions should include estimated operation and maintenance cost, as well as the estimated cost of replacing major equipment. Abenaki has discussed this with its engineering consultant, who will develop these estimates as these alternatives are further developed/evaluated based on pending fire flow requirement information from customers (refer to Omni 1-016). .

- b) See above.
- c) See above.

Abenaki Water Company and Aquarion Company

DW 21-090

Abenaki Water Company and Aquarion Company's Responses to Omni Data Requests—Set 1

Data Request Received: October 18, 2021
Request No.: Omni 1-015

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

REQUEST: Please refer to pages 71-72 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree with the Safety Staff Recommendations contained in paragraph #18, i.e., that Abenaki shall provide an overall matrix that includes all option alternatives, pros and cons, projected annual operational costs, easement requirements and associated costs, and replacement costs for end-of-life equipment, and that the format of this matrix shall ensure a clear understanding of the apples to apples comparison for all input items. See Element #4, Item 7, Item 10, and Item 11 of the Investigation Report.
- b) Please state the basis for the response to Data Request 1-015 (a), above.
- c) Please describe the steps, if any, that have been taken to comply with this recommendation.
- d) Please provide a copy of the matrix referenced in Data Request 1-015 (a), above.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 18, these matrices will be developed as the alternatives are further developed/evaluated based on pending fire flow requirement information from customers (refer to the response to Omni 1-016).

- b) See above.
- c) See above.
- d) The matrices have not yet been completed.

Abenaki Water Company and Aquarion Company

DW 21-090

Abenaki Water Company and Aquarion Company's Responses to Omni Data Requests—Set 1

Data Request Received: October 18, 2021
Request No.: Omni 1-016

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

REQUEST: Please refer to page 72 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree with the Safety Staff Recommendations contained in paragraph #19, i.e. that Abenaki should set a deadline for existing customers to provide fire protection system design demands for pressure and flow in order for Abenaki and its design consultants to utilize the fire protection pressures and flows in the modeling and pressure reduction design alternatives, and that those customers should work with Abenaki in an effort to ensure their existing fire protection needs will be satisfied with each pressure reduction design alternative considered.
- b) Please state the basis for the response to Data Request 1-016 (a), above.
- c) Please describe the steps, if any, that have been taken to comply with this recommendation.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 19, the Joint Petitioners agree with this recommendation, and Abenaki has requested this information from all customers, including Omni. The deadline to receive fire protection system design demands for pressure and flow is November 1, 2021.

- b) See above.
- c) A letter was sent to all customers dated September 28, 2021 requesting their fire flow requirements by November 1, 2021. In addition Abenaki met with Omni on September 30, 2021 to request this information.

Abenaki Water Company and Aquarion Company

DW 21-090

Abenaki Water Company and Aquarion Company's Responses to Omni Data Requests—Set 1

Data Request Received: October 18, 2021
Request No.: Omni 1-017

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

REQUEST: Please refer to page 72 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree with the Safety Staff Recommendations contained in paragraph #20, i.e. that Abenaki shall define the “next steps” to be taken and alternative design options in the event required easements are not granted and/or delayed due to legal proceedings, and that this process should be incorporated into the overall matrix as defined in Staff Recommendation #18.
- b) Please state the basis for the response to Data Request 1-017 (a), above.
- c) Please describe the steps, if any, that have been taken to comply with this recommendation.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff’s Recommendation No. 20, the Joint Petitioners agree that when evaluating alternative solutions the Company will identify easement related risks, actions that can be taken to mitigate these risks, and contingency plans if there are difficulties obtaining necessary easements.

- b) See above.
- c) See above.

Abenaki Water Company and Aquarion Company

DW 21-090

Abenaki Water Company and Aquarion Company's Responses to Omni Data Requests—Set 1

Data Request Received: October 18, 2021
Request No.: Omni 1-018

Date of Response: October 22, 2021
Witness: Nicholas LaChance/ John Walsh

REQUEST: Please refer to page 72 of the Investigation Report.

- a) Please state whether the Joint Petitioners agree with the Safety Staff Recommendations contained in paragraph #21, i.e., that Abenaki shall incorporate and utilize a formal project estimation classification process such as ACEE International's Recommended Practice 18-R-97 or equivalent for refining costs for all design concepts, and that these refined costs shall be incorporated into the overall matrix. See Element #4, Item 13 of the Investigation Report.
- b) Please state the basis for the response to Data Request 1-018 (a), above.
- c) Please describe the steps, if any, that have been taken to comply with this recommendation.

RESPONSE:

- a) The Investigation Report was filed in Docket No. IR 21-024, which is pending, and therefore the Joint Petitioners reserve their right to respond to any findings or recommendations of the Investigation Report in that docket.

In regard to Safety Staff's Recommendation No. 21, the Joint Petitioners agree that a formal project estimation classification process as described in this recommendation should be used for the cost estimates that are developed for the alternative solutions.

- b) See above.
- c) See above.