

**MERRIMACK VILLAGE DISTRICT
BOARD OF COMMISSIONERS
SPECIAL MEETING
JANUARY 11, 2021
MEETING MINUTES
(approved February 22, 2021)**

A special meeting of the Board of Commissioners was conducted on January 11, 2021 at 5:07 p.m. at 2 Greens Pond Road, Merrimack, NH.

Chairman, Donald Provencher presided via electronic participation:

Members of the Board present: Wolfram von Schoen, Vice Chairman (electronic participation)
 John Lyons, Personnel Liaison, (electronic participation)
 Kenneth Ayers (electronic participation)
 Paul McLaughlin (electronic participation)

Members of the Board Absent:

Also in Attendance: Ron Miner, Superintendent
 Jill Lavoie, Business Manager

1. Board of Commissioners to discuss Well 2 building improvements needed to accommodate PFAS treatment.

Chairman D. Provencher informed the public that the purpose of this meeting is to discuss the electrical developments at Well 2 and the building improvements that need to be accommodated. Peter Pitsas, of Underwood Engineers, referenced a packet he had shared with the commissioners titled, "Chronology and Summary of Work at the Existing Well 2 Building." Pitsas explained that the original concept for the project was to have all of the electrical equipment at the Well 2 Water Treatment Plant (WTP). This included all of the VFDs. Prior to submitting the 90% drawings, Underwood's Electrical Engineer noted that the cables running to the wells would be very large and costly to run. Underwood was informed that the voltage drop cannot exceed the allotted amount. Pitsas stated that the way around this limit is to increase the cable size. Pitsas informed the commissioners that it would be logical to have the VFDs and main electrical service entrance located at the Well 2 well building. This would allow MVD to back-feed the Water Treatment Plant (WTP). The WTP would have a minimal load because there are no pumps there. Pitsas stated that once the VFD for Well 2 is operational the existing electrical feed could be demolished and the VFD for Well 9 could be placed at that location. Pitsas informed the commission that the Electrical Engineer noted that it does not make sense to have the generator at the WTP, and it should be moved to Well 2, near the service entrance. Pitsas stated that the 100-year-flood elevation is 172 and the elevation of the existing building is 167.5. The existing pump floor is 4 1/2' feet below the 100-year-flood. The generator will likely be put on higher ground to the left side of the building. Vice Chairman W. von Schoen asked Pitsas if the cables he was referencing were the cables from the VFD to the motor or AC line cables. Pitsas answered that the cables by the WTP would be VFD to motor cables.

Pitsas noted that on page 6 of "Chronology and Summary of Work at the Existing Well 2 Building," he put together a list of questions and answers. The first question asks, *If we look at putting the electrical service entrance and VFDs back inside the new WTP, what would be the re-engineering design cost, cost of the extremely large wires, and schedule delay to issue the RFP?* Pitsas informed the commissioners

that Underwood has not formally asked their subcontractors, but it is believed the engineering costs would be roughly \$20,000. Underwood's Electrical Engineer estimated the cost for larger wires to be approximately \$90,000. Additional electrical components would have to be upgraded to cover the voltage drop. There would be an expansion to the WTP building, with an assumed size of 16'x6' (@ \$350/ft, the additional building cost is approximately \$35,000 above the estimated \$90,000 for larger wires. The schedule for completion of design modifications would be roughly three – four weeks. Superintendent R. Miner asked Pitsas what the distance is from the proposed WTP to Well 2. Pitsas answered that the distance is roughly 500' but varying factors play a role in distance total. Pitsas continued to review the questions. The second question read, *Besides the voltage drop concern with the long runs to both wells, are the extremely large wires needed a result of single-phase power, or is 3-phase available? We must have 3-phase power right? So it must all be due to the long distances to wells?* Pitsas noted that the lines to the wells must be 3-phase due to their size. The need for the large wires is due to voltage drop and the voltage drop is related to the long distance to the wells. The third question reads, *I do agree that although it will likely never happen, it would be catastrophic if we put the VFDs into the well house and they got flooded.* Pitsas noted that this will be reviewed later in the meeting. The third question Pitsas provided read, *I'd like to go over these options further thought, to make a decision, because I'm not specifically following the descriptions of the 3 options with the sketches.* Pitsas informed the commissioners that Underwood has included more verbiage on the sketches to provide an easier understanding. Vice Chairman W. von Schoen stated that he was unclear on the information.

In the discussion of the PFAS filtration plant for Well 2, Vice Chairman W. von Schoen questioned if MVD has existing VFDs and motors in place. Pitsas corrected the information, noting that Well 2 has an existing motor starter, not a VFD. The motors need to be increased due to additional head loss. The current motor starters and the control cabinets for the starters are in the current wellhouse. There are currently short lines due to location. It is recommended that the VFDs be placed in a different location due to risk of flood exposure. Vice Chairman W. von Schoen asked how Well 9 plays into this scenario. Pitsas answered that the capacity of Well 3 is going to be made up by Well 9 because the Naticook Aquifer can support 2,000 gallons per minute (gpm). Once Well 9 is in place Well 3 will no longer be needed. He stated that the treatment plant is designed for 2,000 gpm, which is what Emery & Garrett noted the aquifer can support. Well 2 and Well 9 will be running through the WTP. Well 9 is a submersible pump. There would be a VFD near Well 2, which would run out and power that motor. Vice Chairman W. von Schoen noted that it is not yet determined if Well 9 will be built. Pitsas informed the commission that it is currently set up with a specific bid item for Well 2 work. He explained that if there are 8 bid items (1-8), the project will be awarded in such a way one of the bid items, the bid item for Well 9, will not be awarded. It will be written in that the District has until a specified date to add the remaining bid item to the project. Underwood is proposing it be done this way due to the belief that Emery & Garrett will not have approval on Well 9 until the end of 2021 (estimated). Vice Chairman W. von Schoen stated that he is not sure why the two projects are being combined. He noted that there is a limited budget based on the warrant articles to clean up Wells 2 & 3. Well 3 is currently not being included. Eventually warrant articles will go out for public approval to abandon Well 3 and instead develop Well 9, which comes with its own investment. Vice Chairman W. von Schoen stated that at that point he would assume that MVD runs power to a new Well 9 building and have VFDs within the Well 9 building instead of worrying about it now. He stated that he appreciates the attempt to be proactive but feels that it currently reaches too far. Pitsas clarified what Vice Chairman W. von Schoen said, asking if he meant moving forward with a design just for Well 2 and a WTP and the work for Well 9 would come as a separate project. Vice Chairman W. von Schoen answered that yes, that is what he meant, as the Warrant Articles were approved with the specific purpose of cleaning up Wells 2 & 3. The voters have not yet approved Well 9. Chairman D. Provencher stated that MVD could realize a savings of possibly \$5M by not using Well 3 and not having to build a \$5M iron and manganese treatment system for Well 3. He also stated that the money that was appropriated for the iron and manganese treatment at Well 3

would hopefully be more than enough to cover the entire cost of Well 9, including permitting, installation, and connection. Vice Chairman W. von Schoen reiterated that the voters have not yet approved a new well. He did note that putting money where it makes sense is beneficial for the customer, but he does not know if it is acceptable use of funds without voter approval. Superintendent R. Miner stated that he believes it was discussed as deemed acceptable as it would be replacing similar gallons per minute.

Vice Chairman W. von Schoen asked if it was anticipated that the long lines would be less expensive than putting in an additional small building for the VFDs. Pitsas answered that it may be cheaper to place a small building, but that option was not explored. It was noted that Well 9 would have a submersible pump, and would have just a well head, not a pump house. Chairman D. Provencher noted that a pump house modification at Well 2 would be needed for the Well 2 VFD. He asked if it would be more cost effective to extend the modification at Well 2 to include the VFDs for both Wells 2 & 9, or to place a small building for the VFD at Well 9. Commissioner J. Lyons added that he would like to make remaining bid, mentioned above, conditional based on the approval, or lack thereof, of Well 9, rather than a date.

Chairman D. Provencher asked Pitsas the distance between Well 9 and the WTP. Pitsas answered that it is 1,000 feet. Chairman Provencher then asked what they would be saving by putting a new building for the VFDs down by Well 2. Pitsas answered that it would cut off a little over 400 feet. Sadegh Radvar, the Electrical Engineer for Underwood, explained that it makes sense to put the new VFDs at the Well 2 wellhouse because that's where the concentration of electrical loads is. It would not be practical to put the VFDs away from where the majority of the load is located. By code, there can be a maximum of a 3% voltage drop. Large wires will be needed to meet this. Sadegh Radvar, electrical engineering sub consultant to Underwood Engineers, noted that the VFD rated cables minimize the radio frequency noise and the harmonics. At the VFD itself, because of the long distance of 1,000', there are usually harmonic filters at the load site. If the VFD is placed at Well 9, there will not be a need for the filters due to the proximity of the load site.

Superintendent R. Miner asked Pitsas if the backup generator would only be sized for one pump because of the size of the generator needed to run both. Pitsas answered that he believed that having one higher horsepower pump, the generator needed to be bumped up to an industrial size. The incremental increase isn't that much and both pumps can be included. Sadegh Radvar confirmed this information. Chairman D. Provencher asked about a cost comparison for putting a building at Well 2 and the VFDs at Well 2 versus running everything from the WTP to Wells 2 & 9. Pitsas noted that he did not have that information available. He did inform the commissioners that another option would be a prefab building, which may lower the cost.

Commissioner J. Lyons noted that it appeared there were two issues – one being the electrical and one being the flood plain. He asked if there were solutions to both issues. Pitsas noted that it was his belief that MVD is not seeing a flood out in that area during the 100-year-flood events is because of the culvert on Amherst Road, where Naticook Brook crosses. If that culvert were to become plugged, it would back up the wetlands. Pitsas noted that the contours on that road are 173' and the flood elevations is 172'. On the east side of Amherst road, the flood elevation drops to 155'. NHDES requires that a pumping facility has to be 3' above the 100-year-flood. Pitsas is unsure if an electrical room has the same requirement. There is an ASCE requirement that states the building needs to be constructed 2' above the 100-year-flood. He also stated that FEMA is in the process of updating the flood maps and it may raise the elevations in this area.

At this time, Vice Chairman W. von Schoen referenced the visualizations that Pitsas had provided and stated that he was struggling to understand options 3A and 4 on the site plan. The plans do not show Well 9. Pitsas explained that Well 9 is roughly 1,000' to the right of option 3A. Vice Chairman W. von Schoen asked if there was anywhere that was elevated enough and still on MVD property that would make more sense to place the generator and the VFD building. Because of wetlands, a culvert and road wood need to be added, adding to the cost. Vice Chairman W. von Schoen summarized the needs, stating that three buildings need to be connected, Well 2, Well 9, and wherever the generator is. Ideally, the generator and the VFDs should be in close proximity, otherwise MVD will need to run high power cables to the generator and back to the VFD, and then back to the wells. Additionally, this needs to be high enough to prevent flooding. This can be done artificially by using a pedestal. Devon Smith, with Underwood Engineers, used a topography map to demonstrate to the commissioners to show the possible placement of structures. Vice Chairman W. von Schoen asked if there was a way to add a mezzanine onto the wellhouse building at Well 2 (currently single story). Pitsas noted that it had been discussed and it would require the roof to be removed for an added structure. Underwood does not have any drawings of the existing structure and therefore do not know if it could support an additional structure. Vice Chairman W. von Schoen stated that the VFDs could be placed into the new treatment plant, they could be placed into an addition at the Well 2 building (noting this is likely not ideal due to mixing old and new construction, with the possibility of untrustworthy construction), they could be placed into the new Well 9 building, or they could go anywhere between Wells 2 & 9. Pitsas noted that adding on to the Well 2 building with a higher wall creates issues with snow load (on the roof) as well as the need for a stairway. Underwood discussed sliding the building to the left and creating a hallway to connect the structures. This is not an ideal situation but would remove some of the issues associated with adding on to an existing building. This is option 3A. It is also significantly easier for a contractor to build something new than it is to maintain current operations while adding on to an existing structure. Superintendent R. Miner stated that he likes the idea of one building and believes it to be a good idea to have an electrical room. He suggested building an electrical room 75' away and demoing the original pump house in favor of a pitless adapter at this time, rather than in the future. Pitsas noted that he believes this to be the best idea for the future, however coordinating the work could present a challenge. Well 2 would need to come offline and Well 9 would not yet be up and running. This would be a loss of 1,000 gpm from MVD's capacity. It was noted that there would need to be a vault to house a flow meter. There would need to be a second surge relief line on the raw water line.

Chairman D. Provencher asked Pitsas the distance between the building on option 4 and WTP. Pitsas answered that it is roughly 500'. Superintendent R. Miner asked if the option 4 building could be placed on the same side as the power. Pitsas answered that it is steep on both sides (towards the road and towards the wetlands), but this could be investigated. He also noted that the feasibility of having the building and generator on that side as well could be investigated. Chairman D. Provencher noted that he liked having everything close together on one side. Pitsas gave an estimated cost of \$100,000 above the cost of the building, which included \$50,000 to demo, and \$28,000 for the pitless adapter. Pitsas noted that these would be relatively quick adjustments to the design, but a new building would add to the design time. He did suggest that a prefab building could lessen that impact.

Chairman D. Provencher informed the commissioners that he finds Option 4, with a new electrical building and generator placed above the flood plain, to be satisfactory. He asked if MVD should consider amending the contract to include demoing the building and placing a pitless adapter. Pitsas informed the commissioners that Underwood could add a bid item for the demoing and the pitless adapter that could be decided on once cost is presented. Vice Chairman W. von Schoen stated that he would agree in the full follow through of this project as being beneficial to the public. He also noted there are two ways to support funding, one option is through the warrant articles, and the other is through Capital Reserves. Pitsas shared a map with the commissioners to discuss different locations and the changes necessary for

specific locations to work. Devon Smith reminded the commissioners that a wetland impact in a flood zone moves the permit from a minor wetland permit to a major wetland permit, which requires more time. In reference to the drawings shared by Pitsas, Vice Chairman W. von Schoen asked if the total length of wire, regardless of the location of VFDs and the generator, was the same, and if it would be better to put the VFDs in the WTP. Pitsas explained that certain placements would allow for small wires with lesser loads. Sadegh Radvar explained that if both VFDs were placed at the WTP, there would be 450’ of wires from the WTP to Well 2 (large wires), then from Well 2 to Well 9, which totals over 1,000’. This scenario would also call for an additional filter due to distance. An ideal set up brings the VFD and the motor as close as possible. Vice Chairman W. von Schoen asked if there is currently room for the VFDs in the WTP. Pitsas answered that there is not, which is why there was discussion of adding the 16’x 6’ addition to the building. Vice Chairman W. von Schoen asked if having a smaller pump coupled with an auxiliary pump at the WTP would compensate for the additional head loss, to avoid feeding so much power remotely to Wells 2 & 9. This would lower the horsepower at the pump station and increase the pressure in front of the WTP. Pitsas explained that this could be done but one challenge would be to get the pumps to pump at the exact same flow. This option would also require a tank.

Commissioner J. Lyons asked why the building would need to be demoed if this option were chosen. It was noted that the building does not have to be demoed, but it would deplete the need for additional maintenance. It was noted if the building is not torn down, a new motor will be needed when the pump type is changed. The VFDs can handle either motor. It was estimated that the cost of a motor is around \$10,000.

MOTION BY COMMISSIONER W. VON SCHOEN TO MOVE THE SERVICE ENTRANCE, THE VFDs AND THE GENERATOR TO THE WATER TREATMENT PLANT, AND LEAVE THE CURRENT BUILDING AT WELL 2

MOTION SECONDED BY COMMISSIONER J. LYONS

A Viva Voce Roll Call was conducted, which resulted as follows:

Yea: Donald Provencher, Wolfram von Schoen, John Lyons, Kenneth Ayers, Paul McLaughlin
5
Nay: 0

**MOTION CARRIED
5-0-0**

2. Questions from the Press / Public

None

ADJOURNMENT

**MOTION BY COMMISSIONER J. LYONS TO ADJOURN
MOTION SECONDED BY COMMISSIONER W. VON SCHOEN**

A Viva Voce Roll Call was conducted, which resulted as follows:

Yea: Donald Provencher, Wolfram von Schoen, John Lyons, Kenneth Ayers, Paul McLaughlin

Nay: 5
0

MOTION CARRIED

The January 11, 2021 meeting of the Board of Commissioners was adjourned at 7:45 p.m.

Submitted by Amanda McKenna, Recording Secretary