

RMWC Large Tank Substitution Plan

1.A condensed summary of this document.

This document was started a few months after the hatch at the top of the metal tank closest to the Rainier Mutual Water Company (RMWC) water treatment shed (Tank 1) collapsed due to metal fatigue. The purpose of this document is to offer the Rainier Mutual Water Company (RMWC) Board a starting point in their discussions to repair or replace any of the 3 metal storage tanks that are currently used for water treatment and distribution.

The first of the 2 following pictures is of the collapsed hatch. The second photo shows the “temporary fix” that was installed over the collapsed area on Tank 1.



RMWC does not have a document that describes how old these three metal tanks were when the RMWC community acquired the system from the previous owner, but all 3 tanks are at least 30+ years old. We should assume that the tanks need to be replaced or they will eventually fail due to metal fatigue.

The permitting process to replace 1 (or more) of these tanks will likely take several weeks (if not substantially longer), and the RMWC community will need to leverage other storage tanks when any of these existing tanks needs to be decommissioned. We should expect that we will have to hire at least a geologist and a civil engineer to produce documents that will be needed to get approval to reuse or replace the existing concrete foundations before we can construct replacements that are similar to any of the existing metal tanks. I think we need to leverage

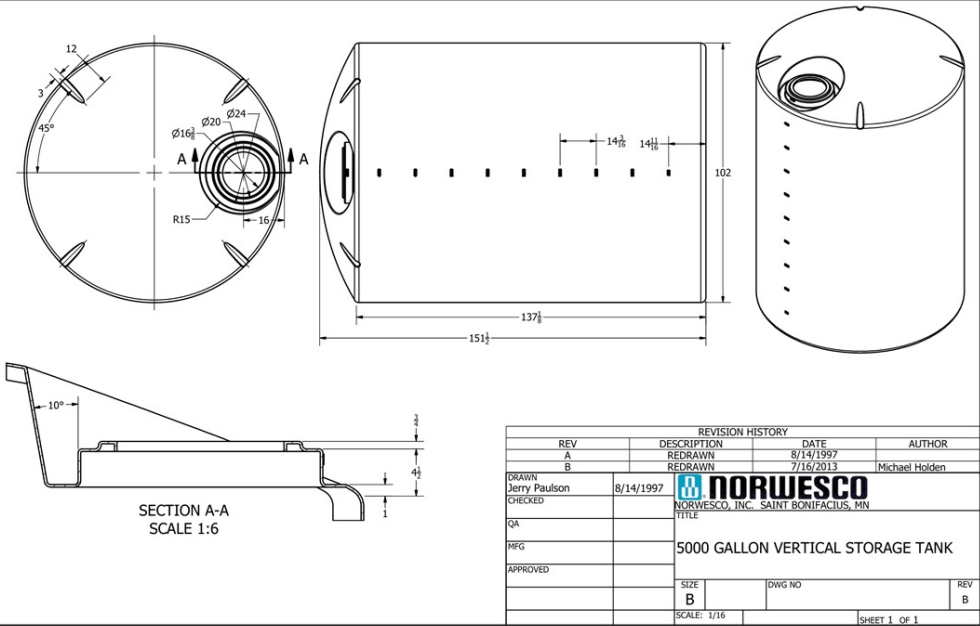
“temporary” replacements for several months (if not more than a year) when we replace any of our existing large metal tanks.

This proposal leverages the largest tanks that can be installed without a permit, and without a concrete foundation. The biggest reason that this proposal tries to avoid permits is because the RMWC community will need to immediately purchase and install replacement tanks if an existing water tank fails. The largest storage tanks on the market that can be installed without a permit are 5000 gallon tanks.

Although this proposal will not require a building permit (at least at the time this proposal was created), this proposal will require some landscaping to provide a robust foundation for each 5000 gallon tank. The landscaping and the plumbing that will connect the tanks are beyond the scope of this document. The RMWC board will have to work with landscaping and plumbing experts to create detailed plans when RMWC is ready to replace one of the large metal tanks.

The most common 5000 gallon water tanks are made of plastic, and there are 3 different shapes on the market. This proposal recommends using the tank type that has the tallest profile (referred to as the “Tall Boy” on some web sites) because more of these tanks can be placed in a small area than the tank options with larger diameters. The “Tall Boy” tanks are more expensive (approximately \$5,400 without tax or delivery in early 2025) than the wider 5000 gallon tanks, but the cost of clearing and leveling an area for the other 5000 gallon storage tanks options is likely to be much more expensive than the cost of the tallboy 5000 gallon tanks. The “Tall Boy” tanks are available at several nearby companies (such as Scotts Valley Sprinkler), and Bruce Carol (our water master) says that some companies will rent such tanks. The RMWC Board will need to decide on where they will purchase or rent tanks when RMWC is ready to acquire tanks.

The following picture is a picture of a “Tall Boy” tank with someone standing in front of it, in case such a photo helps the board members understand the size of these tanks, The schematic diagram after the photo shows all of the dimensions of a tall boy tank.



2.The substitute tank plan will be much simpler and less expensive if the tank placement leverages gravity to distribute water.

The RMWC water system leverages gravity to transfer water from our chlorination tank (Tank 1, the large tank closest to the water treatment shed) to the first processed water distribution tank (Tank 2, which is slightly down-hill from Tank 1). The second distribution tank (Tank 3) is located near the intersection of HW17 and Idylwild RD. Tank 3 is at a lower elevation than Tank 2, so water simply flows from Tank 2 to Tank 3. Ideally, we would place the 5000 gallon tanks to allow us to leverage gravity instead of needing to add infrastructure that would pressurize water to allow the unmodified part of our system to continue functioning the same way the system functions with our current tanks. At this time zero effort has been spent on investigating pressure systems that we would need if we can't place the plastic tanks in a way that uses gravity to transfer water between our 3 main tanks. The cost of pressurization equipment, the possible need for permits to add such infrastructure, the additional land necessary for pressurization equipment, the electrical cost for operation, and the maintenance costs will be substantial compared to the "zero cost" of placing the 5000 gallon tanks to leverage gravity to transfer water.

3.Proposed strategy for replacing the 2 large tanks located at the water treatment plant.

Tank 1 is set up to store approximately 20,000 gallons, Tanks 2 and 3 can store up to 40,000 gallons. We should assume we would need to install enough of the 5000 gallon tanks to replace the storage of our existing tanks (at least 4 of the 5,000 gallon tanks while replacing Tank 1, at least 8 of the 5,000 gallon tanks while replacing either Tank 2 or Tank 3). We should be able to "reuse" the 5,000 gallon tanks if we can replace 1 of the main tanks at t time, and we will need a smaller area to place 8 of these tanks near the water treatment plant than we would need to place 12 tanks if we replaced Tanks 1 and 2 at the same time.

There is a "flattish" area close to Tank 2 that is often used for parking when someone is working at the water plant. This area "curves" behind Tank 2. The width of the area behind Tank 2 is approximately 130 inches, and the "Tall Boy" tank diameter is 102 inches.

The soils expert (Robert Pollak) we hired to assess the issues with the leaning slow sand filters and retaining wall recommended that we **avoid placing 5000 gallon tanks within 12 feet of**

the retaining wall on the north-side of this area. Robert gave this advice before taking soil samples to assess the soil conditions in this area, but it is a conservative recommendation based on a very long career of working in this general area. His recommendation may be less restrictive once we have soil samples evaluated, but I strongly recommend working with his recommendation until we get different advice based on a soil sample analysis.

With careful planning, we may be able to place 2 to 4 5000 gallon tanks in this area while remaining 12 feet from the north end of the retaining wall. The RMWC board will need to coordinate with the health department and our water master to come up with an operating process that the health department will approve that will leverage a smaller chlorination volume while we are leveraging the temporary tanks for chlorination.



3 a). Please avoid using this area for other “improvements” to keep RMWC’s overall improvements costs as low as possible.

Although the RMWC water plant has to add pressure before the filtration and chlorination processes, our current water system does not need any pumps to distribute processed water through RMWC’s pipes. We want to avoid making changes to the system that will require adding pumps and other infrastructure to distribute water to our members. We hope that future RMWC boards will avoid placing any new infrastructure in the “level” areas near Tanks 1 and 2 unless that infrastructure is necessary for filtration or chlorination and the placement in this area ensures that we do not need to also add additional pressurization infrastructure.

Creating a new “level” area for infrastructure that is not part of the filtration and chlorination processes might be much more cost effective for the RMWC community than using up the very limited level area that is adjacent to the existing storage tanks and slow sand filters. I say this because our current water master (Bruce Carol) keeps suggesting that we build a replacement for the control systems lab next to Tank 2. Bruce’s recommendations are based on his

short-term wants to improve his quality of life (he has a long list of reasons why he hates the current shed), but his suggestions tend to assume that RMWC has a significantly larger operating budget than we really have. Bruce's suggestions for "temporary" changes would eat up several years of "RMWC's infrastructure improvement savings"; and those suggestions eventually involve removing the "temporary" infrastructure that would also cost several years' worth of the "RMWC infrastructure improvement savings".

3 b). Suggestion to use temporary tanks to replace Tank 1.

We will have to confirm that the health department will allow us to do the following, but I recommend we wait to get guidance when we think we are ready to replace a tank (or if we need tanks because one of our metal tanks fails). When we need to replace Tank 1, we should be looking for the "temporary Tank 1" to be at a higher elevation than Tank 2. I am hoping that the state will allow us to modify our current Tank 2 to serve as the chlorination tank, and to leverage Tall Boys as a temporary replacement for Tank 2. I am not aware of the costs involved to reconfigure Tank 2 to serve as the chlorination tank, but I think the cost of repurposing Tank 2 will be considerably less than adding pressure infrastructure.

3 c). Suggestion to use temporary tanks to replace Tank 2.

The Tall Boy tanks would be at a lower elevation than Tank 2's location, so it should be "straightforward" to come up with the plumbing between the Tall Boys and a metal storage tank located at either of the existing Tank 1 and Tank 2 locations.

3 d). Suggestion to use temporary tanks to replace Tank 3.

There is a large level area between Tank 3 and Idlywild Rd. I think that this would be a location to place the 5000 gallon tanks after they are no longer needed for "Temporary Tank 1" or "Temporary Tank 2" purposes. The homes served by Tank 3 are usually the first to experience water outages when a pipe break prevents the water company from processing water.

4 Any suggested uses for these plastic tanks after they have served their purpose as temporary replacements for one of the metal tanks?

We can move the tanks to serve as a temporary replacement for the next metal tank we need to replace. After all of the tanks have been replaced, I think that every household that is served by Tank 3 would appreciate having additional capacity available in that part of the community. The

homes served by Tank 3 are the homes that most commonly experience lack of water when a pipe break hampers water distribution.

Another option if the RMWC board does not have sufficient space to use these tanks as additional water storage, perhaps a few members would like to purchase one or more of these tanks for their own personal storage.