# Twin Forks MDWCA

## Standard Operating Procedure A.1

## Routine Operation of System

Approved by the Board of Directors
[September 17, 2005]

### I. Description of Twin Forks MDWCA Water Distribution System

The following is for the purpose of describing the routine operation of the Twin Forks MDWCA water distribution system. It is not intended to describe the construction of the system, the location and sizing of lines, etc.

For security reasons, this document does not give the locations of the water sources, tanks, lines, valves, meters, and connections. The Twin Forks MDWCA office can provide a sheet containing this information as needed.

### A. Definition of Terms (refer to the Schematic of Delivery System figure)

**Sources of water**

| | |
|---|---|
| S1 | Spring #1 (Baird) |
| S2 | Spring #2 (Sewell) |
| S4 | Spring #4 (Andrews) |
| W1 | Well #1 |
| W2 | Well #2 |

**Tanks**

| | | |
|---|---|---|
| T1 | Tank #1 | 12,000 gallons, elevation ≈ 7980 feet |
| T2 | Tank #2 | 2A 12,000 gallons; 2B 12,000 gallons, elevation ≈ 7900 feet |
| T3 | Tank #3 | 20,000 gallons, elevation ≈ 8170 feet |
| T4 | Tank #4 | 4,000 gallons, elevation ≈ 8040 feet |

| | | |
|---|---|---|
| T5 | Tank #5 | 8,000 gallons, elevation ≈ 7880 feet |
| T6 | Tank #6 | 22,000 gallons (not in use), elevation ≈ 7950 feet |
| T7 | Tank #7 | 12.000 gallons, elevation ≈ 7912 feet |
| T8 | Tank #8 | 12,000 gallons, elevation ≈ 7912 feet |
| T9 | Tank #9 | 12,000 gallons, elevation ≈ 7620 feet |

**Residential Areas**

| | |
|---|---|
| James Canyon (JC) | southwest of the James Canyon VFD and south of Hwy 82, in west lobe of system |
| Twin Forks West (TFW) | north of Hwy 82, west of Dry Canyon Road, in west lobe of system |
| Twin Forks East (TFW) | north of Hwy 82, east of Dry Canyon Road, in west lobe of system |
| Sixteen Springs West (SSW) | north of Hwy 82, from Twist Lane to 16 Springs Canyon Road, in east lobe of system |
| Sixteen Springs East (SSE) | north of Hwy 82, east from 16 Springs Canyon Road, in east lobe of system |
| Forest View (FV) | north of Hwy 82, east of SSE in most easterly lobe of system by water office, |

## B. Description of Operation of System (refer to Figure "Schematic of Delivery System")

Spring #2 (Baird) supplies Tank #1. At present, this is the only source of water for Tank #1 and the James Canyon (JC) district. Once Tank #1 fills to approximately 72 inches, it overflows into a pipe which runs through a culvert under Hwy 82 and fills Tank #2 by gravity flow. Water from Spring #2 passes through a chlorinator before it enters Tank #1. Tank #1 feeds the JC district through two lines, each of which has a valve and a meter.

Spring #1 (Sewell) supplies Tank #2, which also receives water from the Tank #1 overflow and from Well #2. Water from Spring #1 passes through a chlorinator before it

enters Tank #2. Water from Well #2 is delivered to Tank #2 through a residential line, which has twelve residential user taps on it.

Note: There are two 12,000 gallon tanks at the site, 2A and 2B. They are connected by a pipe at the bottom of the tanks, and hence they function as one 24,000 gallon tank.

Since Tank #3 is the highest point in the system, water must be pumped from Tank #2 to Tank #3.

Water can be transferred from Tank #2 to Tank #3, the primary supply tank for the TFW, TFE, SSW, SSE, and FV districts, in two ways:

A. When temperatures are high enough, a line running (above ground) from Tank #2 to Tank #3 [L-T2-T3] is the preferred method.

B. In the Winter when temperatures are low and L-T2-T3 freezes, water is transferred to Tank #3 through the TFW district supply lines.

Although it is possible to transfer water directly from Well #2 to Tank #3 through the TFW district supply lines, such transfer is discouraged. There are many residential taps on the lines, and hence many chances for loss by leaks or open valves.

The TFW, TFE, SSW, SSE, and FV districts are (primarily) supplied from Tank #3 by gravity flow. Tank #4 -- high up in the TFE district -- and Tank #5 -- high up in the SSW district -- can be filled from Tank #3. Typically, Tank #4 and Tank #5 are kept filled as reserves for additional supply in times of exceptionally high use, such as Memorial Day, July 4$^{th}$, and Labor Day weekends.

In order to transfer water from the western lobe of the system (JC, TFW, and TFE) to the eastern lobe of the system (SSW, SSE, and FV), water must be moved "across the mountain" through a 3900 foot 2 inch diameter line [L-T4-SSW] that runs from near Tank #4 to its connection into the SSW distribution system. This line is above ground and is susceptible to freezing in the winter. The freezing can be delayed – but not eliminated – by running water through the line. Water can also be moved from Well #2 to Tank #9 by tanker truck.

Tank #6 was formerly supplied by S3 (the Slough Canyon or Brooks spring). It now functions only as a reserve tank (with a useful capacity of about 10,000 gallons), which is filled from the SSW district.

Tank #7 and Tank #8 are located side-by-side high up in the SSE district. These two tanks are connected by a pipe approximately 72 inches above the ground. Unlike the tandem Tank #2A and Tank #2B, Tank #7 and Tank #8 sometimes function in tandem and sometimes function independently.

The connection to the SSE district comes into a manifold, so that Tank #7 and Tank #8 can be filled from the SSE distribution lines at the same time. This manifold also connects to the FV district, so that SSE and FV districts can be supplied from Tank #7 and Tank #8. Tank #8 (but not Tank #7) can be filled directly with water pumped from Tank #9, and once Tank #8 is full, the overflow will fill Tank #7.

Tank #9 does not receive water from Tank #7 and Tank #8. It is supplied by water from Spring #4 and Well #1 (and sometimes by a tank truck that brings water from Well #2).

## II. Routine Filling of Tanks

Equipment needed: tape measure, keys, and flashlight

1. Start at Tank #3. Unlock the tank lid, and dip the free end of the tape measure into the tank until ripples appear on the water surface (end of the tape measure just touches the water surface). Record the measurement to the nearest inch. Subtract the measured air height from 156 inches to obtain the water level in Tank #3. Record the water level in the log. If Tank #3 needs to be filled, water will have to be transferred from Tank #2.

2. Proceed to Tank #2. Make the measurement as in the previous paragraph. Subtract the measurement from 96 inches obtain the water level in Tank #2. Record the water level in the log.

3. In order to transfer water from Tank #2, open valve V-T2-T3 and set the timer (inside the pump house) for the estimated time required for the pump to be on. (The pump will require approximately 60 minutes per 10 inches of height from the measurement in Paragraph 1.)

4. If it is necessary to transfer water to Tank #2, proceed to the well, open valve V-W2-T2, and turn on the well pump. The pump will require approximately 60 minutes per 10 inches of height from the measurement in Paragraph 2.

5. Proceed to Tank #1. If Tank #1 is full, water will be flowing in the overflow pipe. Listen for the gurgle. If you hear it, Tank #1 is full, and there is no need to measure the height of the water in Tank #1. Otherwise measure the water level as before. Subtract the measurement from 96 inches in order to obtain the height of the water in Tank #1. Record the measurement in the log. (Actually if the water is coming into Tank #2 from the Tank #1 overflow, there is no need to proceed to Tank #1 to take a measurement. The "gurgle" is heard in Tank #2. You need to proceed to Tank #1 just to make sure the spring, spring box, chlorinator, and tank area is secure.)

6. Proceed to Tank #7 and Tank #8. Measure the level in each tank as before, subtract the measurements from 96 inches and record in the log.

7. In order to transfer water into Tank #7 and Tank #8, proceed in one of two ways:

A. From SSE

Open valve V-T7&8-SSE and allow water to flow from SSE into Tank #7 and Tank #8. It will require approximately 60 minutes per 10 inches of height.

B. From Tank #9

Go to Tank #9, and turn on the pump. It will require approximately 60 minutes per 10 inches of height.

8. At Tank #9, measure the water level as before. Subtract from 96 and enter the result in the log.

9. In normal operation, Tank #4 is used only as a backup water supply to TFE. If it is desired to read the level in Tank #4, make the measurement as before. In order to transfer water to Tank #4, close valve V-LFT4-SSW. Tank #4 will fill by gravity from Tank #3. It will require approximately 60 minutes per 12 inches of height in Tank #4

10. In normal operation, Tank #5 is used only as a backup water supply. To SSW If it is desired to read the level in Tank #5, make the measurement as before. In order to transfer water to tank #5, valve V-T4-SSW (near Tank #4) must be closed and valve V-SSW-T5 must be open. It will require approximately 60 minutes per 12 inches of height in Tank #5.

11. In normal operation, Tank #6 is not used.