FOREST LAKES WATER COMPANY

General Operation & Maintenance Manual

2006

Created 1-3-06

Amanda Gartland

OPERATION AND MAINTENANCE MANUAL

System Name: Forest Lakes Water Company

PWSID No.: NJ1904003

Address: PO Box 264

Andover, NJ 07821

Municipality/ County: Byram & Andover Twp/ Sussex County

Telephone No.: 973-786-6600

System Type: ● Community ○ Non-Community

Total Population: 2350

Service Connections: 408

Water Allocation Permit #: 5098 - 6.0 MGM

Plant Annual Delivered Water Rate: 0.096 MGD

O & M Manual Prepared By: Board of Trustees

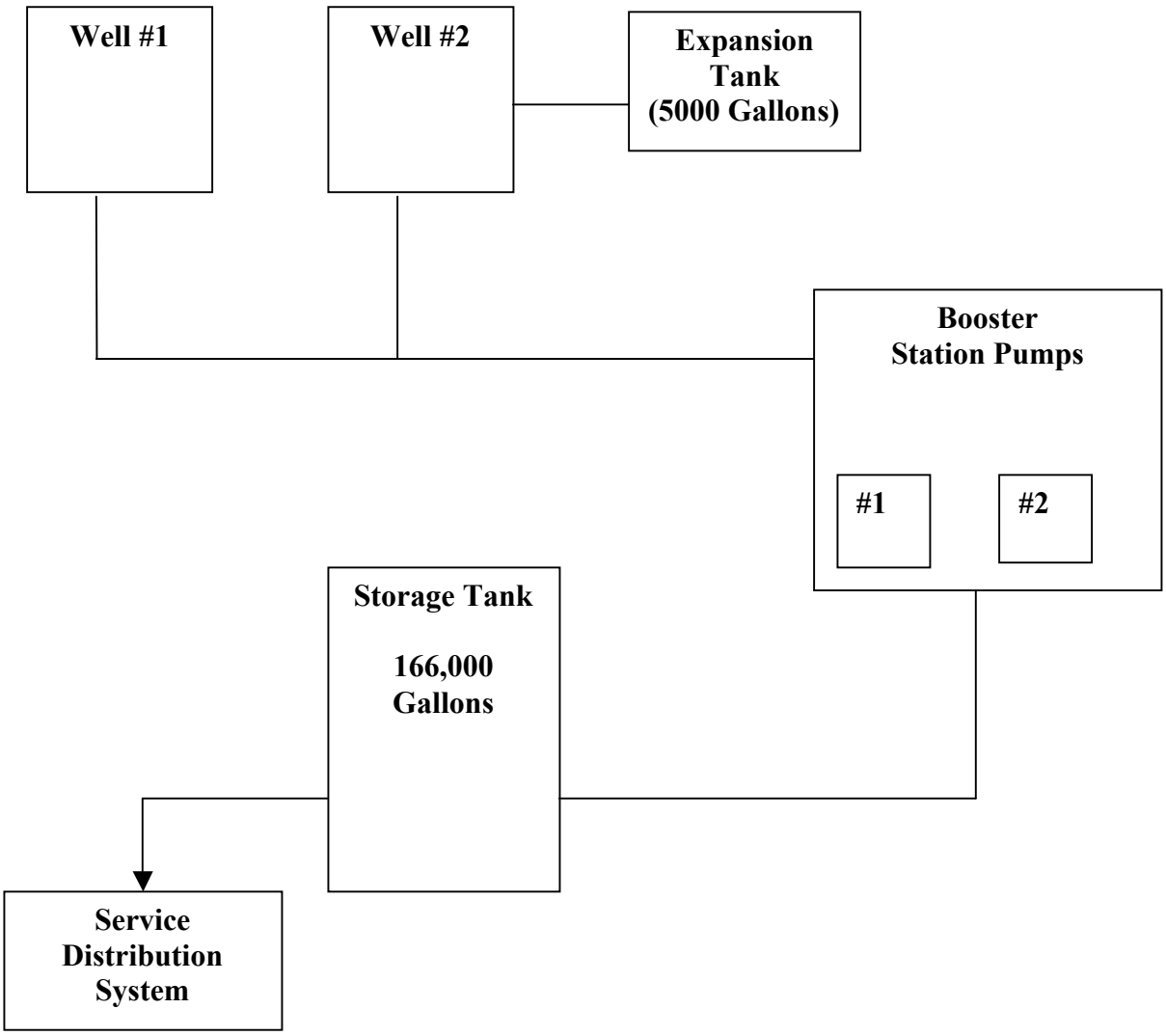
Date Completed: _____

Date Updated: _____

Section 1: Description of Facilities

Service Area:
*Description, map or location of map

Line Diagram



Well Sources
*complete for each Well

Name: Well #1
Location: Pumphouse- Forest Lakes Drive
Well Record Attached: ● Yes ○ No

Latitude/Longitude: _____ **Diameter:** ≈ 4 in.
Date Drilled: 1958 **Depth:** ≈ 175 ft.
Well Driller: NA

Type of Pump: Gould
Horsepower: 15
Capacity (GPM) 135

Controls (manual, automatic): Automatic

Specs Attached: ● Yes ○ No

Name: Well #2
Location: Pumphouse- Forest Lakes Drive
Well Record Attached: ● Yes ○ No

Latitude/Longitude: _____ **Diameter:** ≈ 4 in.
Date Drilled: 1974 **Depth:** ≈ 175 ft.
Well Driller: NA

Type of Pump: Gould
Horsepower: 20
Capacity (GPM): 250

Controls (manual, automatic): Automatic

Specs Attached: ● Yes ○ No

Treatment- *Disinfection*

Chlorine Contact Time: _____minute at flow rate: _____ gpm

Chemical used: Sodium Hypochlorite
Strength: 7% solution
Container Size: 15 Gallon
Where Stored: Pump House

Supplier: Culligan
Phone No.: _____

Type of Chemical Feeder: LMI Pump
Manufacturer/ Model No.: Liquid Metronics
Capacity (gpd): 14 GPD
Pressure: 150 PSI
Controls (manual, automatic): Automatic

Pump Specs attached: ● Yes ○ No

Treatment- *Other*
*complete for each treatment scheme

Purpose:

Chemical used: NA
Strength: _____
Container Size: _____
Where Stored: _____

Supplier: _____
Phone No.:

Type of Chemical Feeder: _____
Manufacturer/ Model No.: _____
Capacity (gpd): _____
Pressure: _____
Controls (manual, automatic): Automatic

Feeder Specs attached: ○ Yes ○ No

Method for Process Control: Storage Tank Level Control- Phone Signal

Distribution System

Pipe Material: Transite
Pipe Diameter: 4" and 6"
Pipe Length: 10 miles

No. of Fire Hydrants: 54

No. of Meters: None

If an inventory of distribution materials (ie pipe, valves, etc.) is maintained, where is it located? Pump House #1 and #2

Are there any cross connections? ○ Yes ● No
If yes, are the appropriate backflow devices installed/ permitted? ○ Yes ○ No

Are there any interconnections? ○ Yes ● No
If yes, detail the location, the seller and the interconnection capacity: _____

Finished Water Storage

*complete for each storage tank/facility

Type: Mild Steel Rings
Location: Crows Nest Road
Size: 166,000 Gallons

Year Constructed/ Installed: 1992
Manufacturer: Field Erected- Leo Purcell Engineers
Maintenance Required: None

If pressure tank, pressure range (psi): NA

Specs attached: ○ Yes ● No

Section 2: Start-up and Daily Operations

Controls

Q: What controls the start-up of your water source?
(Automatic? Manual? If automatic, what activates the pump? Pressure Switch? Level controls?)

A: Automatic/ Pressure Switch/ Storage Tank Level Indicator

Q: What controls the shut-down of your water source?
(Automatic? Manual? Pressure drop? At what pressure does the pump shut off?)

A: Automatic/ Pressure/ 20 psi

Q: What controls water levels in the storage unit?
(altitude valve, float, pressure?)

A: Float Valve

Disinfection

Q: What controls the start-up of the chlorinator?

A: Interfaced with Water Pump

Q: What controls the shut-down of the chlorinator?

A: Interfaced with Water Pump

Q: What controls the dosage?

A: 50 Gallon mix solution. Pump stroke and speed.

Chemical Feed-
Strength delivered: 1.2%
Is dilution required? ●Yes ○No
If yes, 1 gal of liquid chlorine mixed with 50 gals water

Residual obtained: 0.5 mg/L
How is residual measured? Total Chlorine Test
Frequency: Weekly
Where: See Map
When: See Schedule

Section 3: Maintenance

Equipment List

(include safety equipment such as eye washes, fire extinguishers, first aid kits, etc)

Item Description	Location
- Eye Wash Station	- Pump House #1 and #2
- Goggles/ Apron	- Pump House #1 and #2
- Fire Extinguisher	- Pump House #1 and #2
- First Aid Kits	- Pump House #1 and #2

Specs attached: ○ Yes ● No

Spare Parts List

Item Description	Location
TBD	

Specs attached: ○ Yes ● No

Section 4: Monitoring

Monitor Information

Monitoring Schedule Attached: ● Yes ○No

Samples collected by: Bill Grinnille- Liscense Operator

Certified Laboratory: Accurate Analytical Labs
Certification No.:
Address: _____

_____

_____

Phone No.: _____

Does the lab send monitoring forms directly to the State? ○ Yes ● No

In the case of a MCL, does the lab notify the State? ○ Yes ● No
In the case of a MCL, does the lab collect check samples? ○ Yes ● No

Laboratory Contract Attached: ● Yes ○ No

Method of Public Notification (mass mailing, radio, newspaper, etc.)

- Mass Mailing
- Consumer Confidence Report
- Phone Chain

Copies of monitoring forms are filed at Bureau of Safe Drinking Water- DEP

Consumer Confidence Report is prepared in (month) June, distributed in (month) July and a copy is filed at DEP.

Daily Start-up Checklist

Inspected by/ Date: _____

- O Well pump operational
- O Disinfection tank full/ chlorine cylinder not empty
- O Disinfection feed pump setting (speed/ stroke_____)

- O Physical inspection of feed pump, tubing injection assembly
- O Mechanical inspection of piping, motors, sumps
- O Electrical inspection of wires, fuses
- O Other (describe)

- O Water flows recorded (does daily flow exceed 80-100 gals/person?)
- O Pressure checked

Additional start-up steps:

_____

_____

_____

_____

_____

_____

_____

_____

_____

Emergency Flags

An emergency exists when:

- The flow leaving the plant exceeds__300_____gpm
- Water pressure falls below__20____psi
- Entry point chlorine residual is less than ___0.1_____ppm
- Other (describe) _____

Well Log

Month/ year _____

Day	Pumpage	Comments
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
Total		
Average		

Preventive Maintenance and/ or Testing Log

Item Name	Location	Procedure	Initials/ Date

Section 1: Overview

Statement of Purpose

The purpose of this document is to provide the general operations of the water system, wells and booster pumps to provide water service to its customers/owners. In addition, the manual will provide detailed instructions on daily use under normal operations.

Well #1

Description: This well is generally used daily for the normal operations. It is set on automatic and runs based on the water level in the storage tank. Chlorine is added to the one (1) 50 gallon tank that is located in the upper level of the well house. The chlorine pump stroke and speed are pre-set and should not be altered. Chlorine mixture is added based on water meter signal whether well pumps are in automatic or manual mode.

Well #1 Mixture: One (1) gallon of 7% Hypochlorite liquid to One hundred (100) gallons of raw water as a stock solution

Well #2

Description: This well is used as a back-up to Well #1 only when the demands on the system are such that the storage tank cannot be refilled from Well #1. When Well #2 pump is activated, Well #1 pump will shut off on pressure relief. If Well #2 needs to be used, the following steps should be taken:

- Step 1- Before turning the well on, ensure that someone is at the booster station to turn Booster #2 on (See booster station operation)
- Step 2- The pump should be turned to Manual

Well #2 Mixture: One (1) gallon of 7% Hypochlorite liquid to thirty (30) gallons of raw water as a stock solution

Section 2: Booster Station

Booster Station Equipment:

Two (2) Booster Pumps for the Wells
One (1) Automatic Controls box for the Booster Pump
One (1) Pressure switch for the pumps

Booster #1: This pump runs with the operation of Well #1 in the Automatic position. The discharge valve is set to keep a minimum pressure of 20 PSI on the suction side of the pump. The setting is necessary so that the pump does not break suction and become air bound.

Booster #2: This pump can be used for either well. The main purpose of Booster #2 is to be used with Well #2 due to the fact that Well #2 has the larger of the two (2) pumps. To initiate use of Booster #2, adhere to the following steps:

- Step 1- Before starting the pump, ensure that someone is at Well #2 to turn it on manual
- Step 2- When the pressure increases at the Booster station, turn Booster #2 pump on manual and turn off Booster #1 pump.
- Step 3- The valves are pre-set, however check to see that the pressure on the suction side is at the predetermined 20 PSI so that the pump does not become airbound.

Section 3: Automatic Controls

Location: The transmitter is at the storage tank on Crows Nest.

Operation

An analog phone signal is sent to the Booster station to activate a Booster pump which in turn will activate Well #1. Should the automatic controls be out of service, Well #1 and Booster pump #1 must be turned to manual.

While in the manual mode, to find the water level of the tank

- Step 1- Go to the tank
- Step 2- Look at the level indicator on the side of the tank
- Step 3- The higher the water level, the lower the indicator is on the tank

When the tank is full based on water level indicator, shut down the Booster pumps. As a follow up:

- Step 1- Check the level every few hours.
- Step 2- When the level indicator shows three quarters (3/4) full water level in the tank, turn the Well #1 pump and Booster #1 pump on.

(If running Well #2 and Booster #2 for peak demands or as a back-up system for Well #1, Follow Well #1 and Booster pump Manual operation)

Section 4: Disinfection/ Treatment

Disinfectants and Disinfection Byproducts Plan

The water company operates a ground water system that is not under the direct influence of surface water that serves fewer than 10,000 people. This has been determined by The New Jersey Department of Environmental Protection (NJDEP).

The source of Forest Lakes' water comes from two wells located off of Forest Lakes Drive in Andover, NJ. The wells draw their water from the Hardyston Quartzite Aquifer. Both wells merge into one line or pump from the same aquifer for a One (1) point of entry classification.

Treatment is accomplished by Hypochlorination using a 7% sodium hypochlorite liquid mix with water in a 50 gallon tank. Sodium hypochlorite is purchased in liquid form from Culligan Water Conditioning.

Storage Tank Location: Crows Nest Road in Forest Lakes, Andover, NJ. Capacity 166,000 gallons.

Description of Wells:

Well #1-	POE/Facility ID#:	TP001003
	Treatment Class:	T-1
	Capacity:	.166 MGD/ 239 GPM
Well #2-	POE/Facility ID#:	TP001003
	Treatment Class:	T-1
	Capacity:	.288 MGD/ 415 GPM

Under the Stage I Plan of the DBPR as outlined by the USEPA, the system is required to monitor for TTHM, HAA5 and Chlorine in the system as follows:

TTHM: One sample per plant per year during the warmest water temperature. Location is representing maximum residence time.

HAA5: One sample per plant per year during the warmest water temperature. Location is representing maximum residence time.

Chlorine: Two samples per month same time as total Coliform samples are taken. Locations are to be from two separate areas of system analysis for chlorine is to be taken either before or after sampling

Section 5: Monitoring Period

MONITORING PERIOD 2006
*Supplied by the NJDEP

Facility No./ Sampling Pt.	*Facility Name*	*Analyte Name*	*Sample Count, Type and Frequency*	*Monitoring Sample Period*	*Monitoring Sample Year*
DS	Distribution System	Coliform, Total (TCR)	2 Routine Sample(s) Every Month	Between 01/01-12/31	2006
DS	Distribution System	Lead and Copper	10 Routine Sample(s) Every Three years	Between 06/01-09/30	2006
DS	Distribution System	Total THM-HAA5	1 Routine Sample(s) Every Year	Between 07/01-09/30	2006
TP001003	Well TP/ Forest Lake Drive	Gross Alpha, Including RA & U, Excluding RN	1 Routine Sample(s) Every Quarter	Quarterly 3/27 6/12	2006
TP001003	Well TP/ Forest Lake Drive	Inorganics	1 Routine Sample(s) Every Three Years	During Year 6/12	2006
TP001003	Well TP/ Forest Lake Drive	Nitrate (AS, N)	1 Routine Sample(s) Every Year	During Year 6/12	2006
TP001003	Well TP/ Forest Lake Drive	Radium-228	1 Routine Sample(s) Every Quarter	Quarterly 3/27 6/12	2006
TP001003	Well TP/ Forest Lake Drive	Secondary	1 Routine Sample(s) Every Three Years	During Year 6/12	2006
TP001003	Well TP/ Forest Lake Drive	Vocs State	1 Routine Sample(s) Every Three Years	During Year 6/12	2006

Notes:

1. All emergency sources must be sampled if and when used and the Department notified prior to use
2. If a point of entry is taken off line for an extended period of time you must notify the Bureau of Safe Drinking Water so it can be inactivated and monitoring requirement suspended
3. TP= treatment plan; WL= untreated individual wells; CH= wells connected together by a common header or manifold but without treatment; and IN= surface water intakes.
4. Systems which use chemical disinfection:
   For surface water systems- THM and HAA5 sampling requires 4 sampling points per surface water treatment plant within the distribution system
   For groundwater systems- THM and HAA5 sampling requires 1 sampling point per treatment plant within the distribution system at the maximum residence time.
5. This plan in its entirety will be reviewed and updated on an annual basis.

Section 6: NJEMS General Inventory Report

General Information

Water System Name: Forest Lakes W Co
PWSID No.:NJ1904003

Municipality: Byram Twp
County: Sussex

Water System Type: Community
Total Population Served: 2350
Total Number of Service Connections: 408

Demographics

County	*Municipality*	*Total Service Connections*	*Total Population Served*	*Comments*
Sussex	Byram & Andover Twp	408	2350	

Wells

Description	*Permit Types*	*Designation*	*Status*	*Availability*	*Status Date*	*Total Effective Capacity*
Well #1	Domestic	2200000591	Active	Permanent		
Well #2	Domestic Replacement	2200024893	Active	Permanent		
Well #3	Domestic	2200013368	Inactive	No Current Use	04/12/03	

Intakes

Description	*Designation*	*Status*	*Availability*	*Status Date*	*Mean Flow*	*Minimum Flow*	*Maximum Flow*

Interconnections

Description	*Designation*	*Status*	*Availability*	*Status Date*	*Total Effective Capacity*	*Supplier ID*	*Receiver ID*

Pump Stations

Description	*Designation*	*Status*	*Availability*	*Status Date*	*Total Effectcive Capacity*	*Firm Capacity*
Forest Lakes Drive BS	2	Active	Permanent	07/01/03	.53 MGD	MGD

Storage Tanks

Description	*Designation*	*Status*	*Availability*	*Status Date*	*Storage Capacity*
Hydropneumatic Tank	01	Active	Permanent	07/01/03	0.005 MG
Underground Tank	01	Active	Permanent	07/01/03	0.002 MG
Crow's Nest Road Stanhope	03	Active	Permanent	07/01/03	0.166 MG

Storage Tanks (cont)

Description	*Storage Type*	*Height*	*Diameter*	*Length*	*Width*
Hydropneumatic Tank	Hydropneumatic	ft	ft	ft	ft
Underground Tank	Underground	ft	ft	ft	ft
Crow's Nest Road Stanhope	Standpipe	ft	ft	ft	ft

Treatment Plants

Description	*Designation*	*Status*	*Availability*	*Status Date*	*Production Capacity*	*Firm Capacity*	*Capacity Under Auxillary Power*
Well TP/Forest Lake Drive	TP001003	Active	Permanent	07/01/03	0.63 MGD	MGD	MGD

Treatment Plant Processes (Active Plants ONLY)

Description	*Designation*	*Treatment Step*	*Treatment Unit*	*Treatment Objective*	*Treatment Order*
Well TP/Forest Lake Drive	TP001003	Hypochlorination, Post	Disinfection	Disinfection	1

Facilities Flow

Treatment Plant	*Sources*
Well TP/Forest Lake Drive	Well 1
Well TP/Forest Lake Drive	Well 2
Well TP/Forest Lake Drive	Well 3

Section 7: Contact Information

Board of Trustees- Forest Lakes Water Company
P.O. Box 264 Andover, New Jersey 07821
Office: 973-786-6600
Fax: 973-786-5532

Board of Trustees

Name	Home Phone	Office/ Cell	E-mail
Scott Seiler	973-786-6755	973-496-7282 973-222-1937 (cell)	scott.seiler@cendant.com
Charles Gartland	973-786-6457	973-919-3663(cell)	gartland@mindspring.com
John McDonough	973-786-6537	973-267-3244 973-222-6011 (cell)	j_mcdonough@ppecorp.com
Bob Nosenchuk	973-786-6409	973-786-7705 201-874-9104 (cell)	bob.nosenchuk@motorola.com
Bob Chozick	973-786-7585	973-630-8594 973-216-5123 (cell)	rchozick@earthlink.net
Dorothy Gorman	Pager	973-209-6661	forestlakeswatercompany@att.net flwc@mindspring.com

Professional Advisors

Key Advisor	Function	Home Phone	Office Phone
Joe Gilligan	Attorney		973-347-3100
Norman Katz	Accountant	973-228-1929	973-627-8487
Bill Grennille	Lic. Operator	973-948-3848	973-383-2090 973-903-3172 (cell) billg@newtontownhall.com
Robert Mooney	Maintenance	973-209-3879 (beeper)	973-786-5692
Dick Mooney	Heavy Equipment		973-786-6713
John Miller	Suburban Consulting Engineers		973-328-2801

Board of Public Utilities

Phone Number: 973-648-2026
Address: State of New Jersey
Board of Public Utilities
Two Gateway Center
Newark, New Jersey 07101

BPU Complaint Number: 800-627-0241
After 5:00 p.m. 973-648-2350

NJDEP- Bureau of Safe Drinking Water, Trenton
Contact: Barker Hamill
Phone Number: 609-292-5550

Revised 1/06

Section 1: Maps

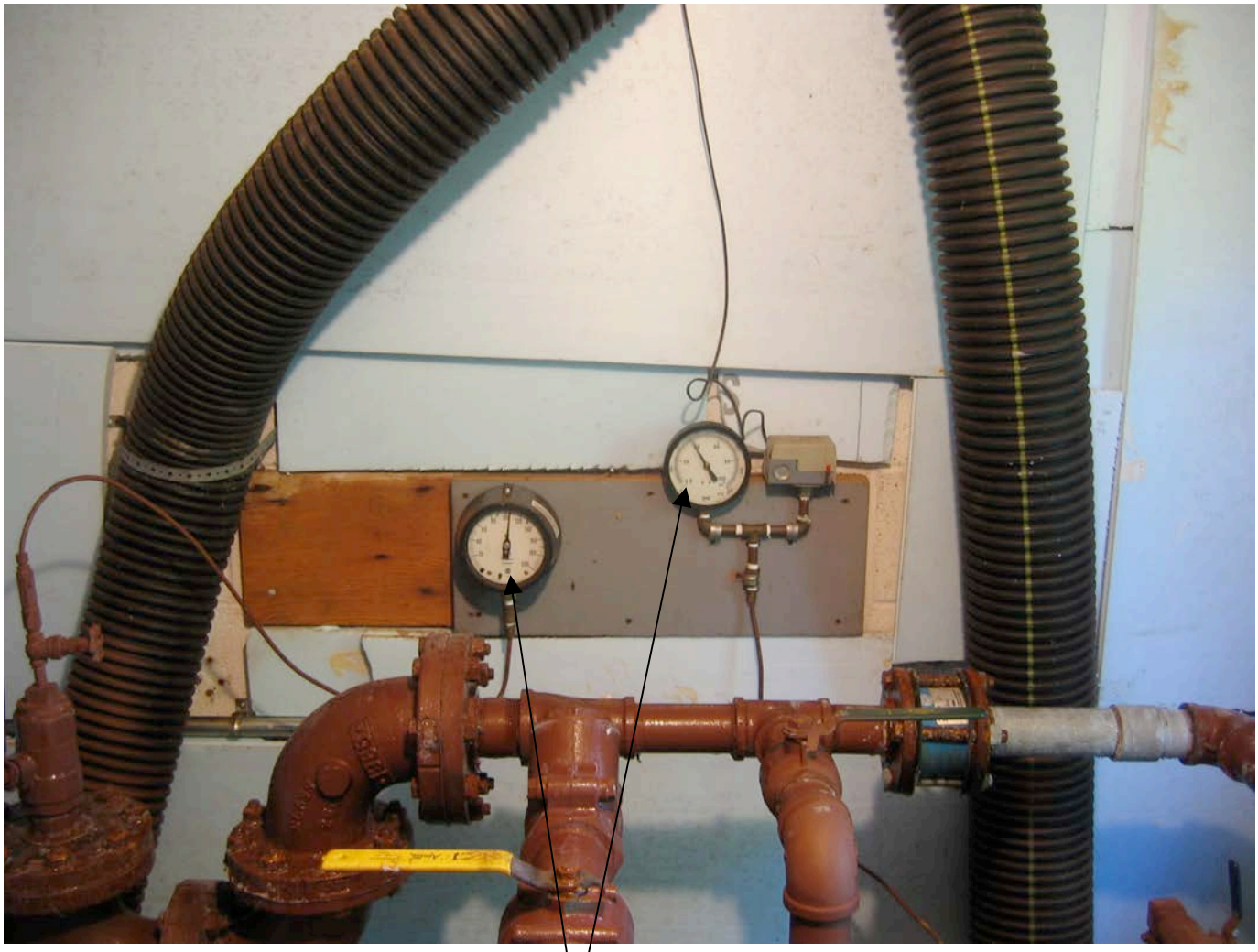
System map

It should be noted that the water mains run down the roadway. Locations of the wells and sampling locations are shown on the map.

BOOSTER STATION

BOOSTER PUMPS

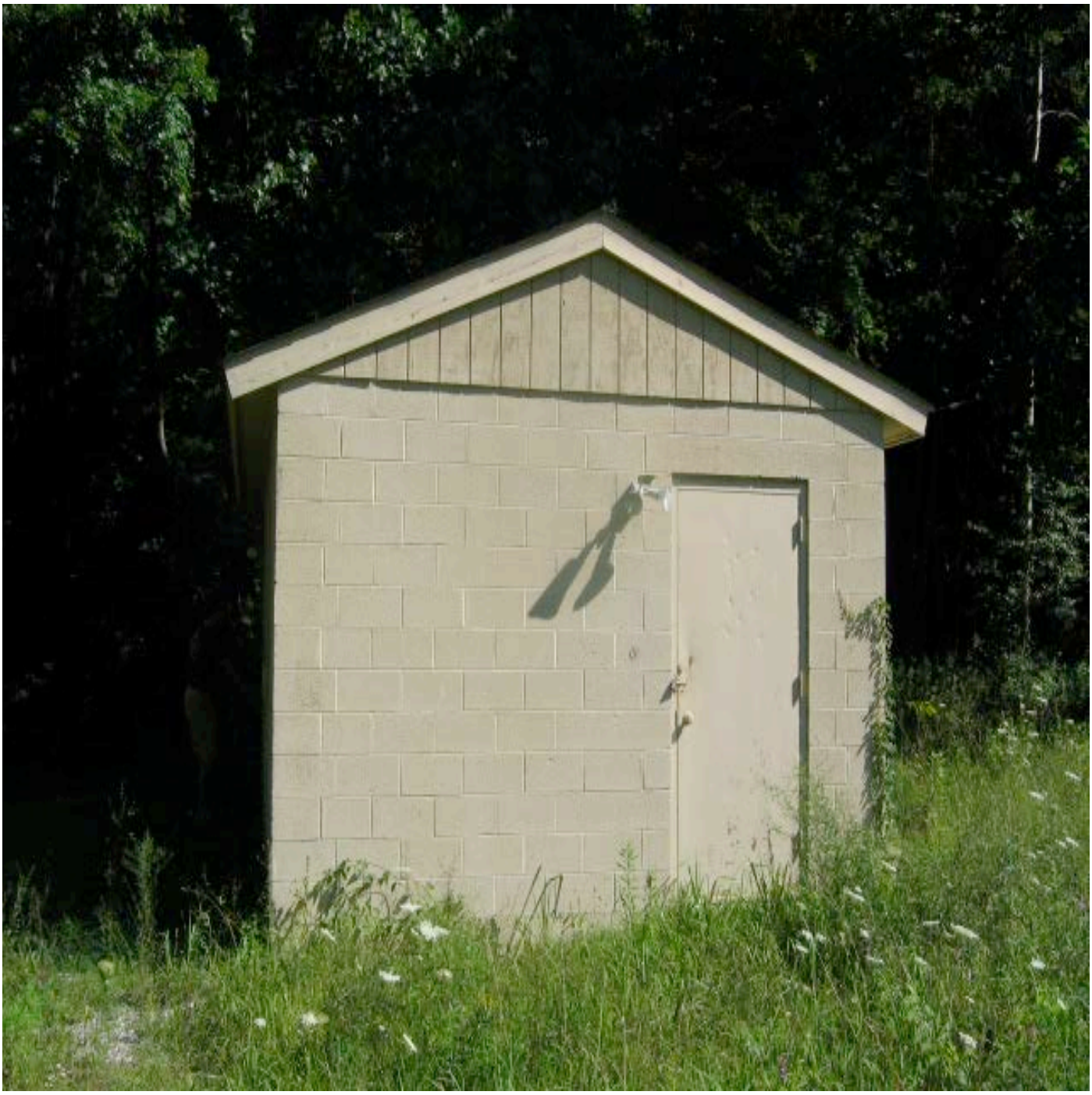
BOOSTER STATION- ***Pressure Gauges***



BOOSTER STATION- ***Electrical Panel***

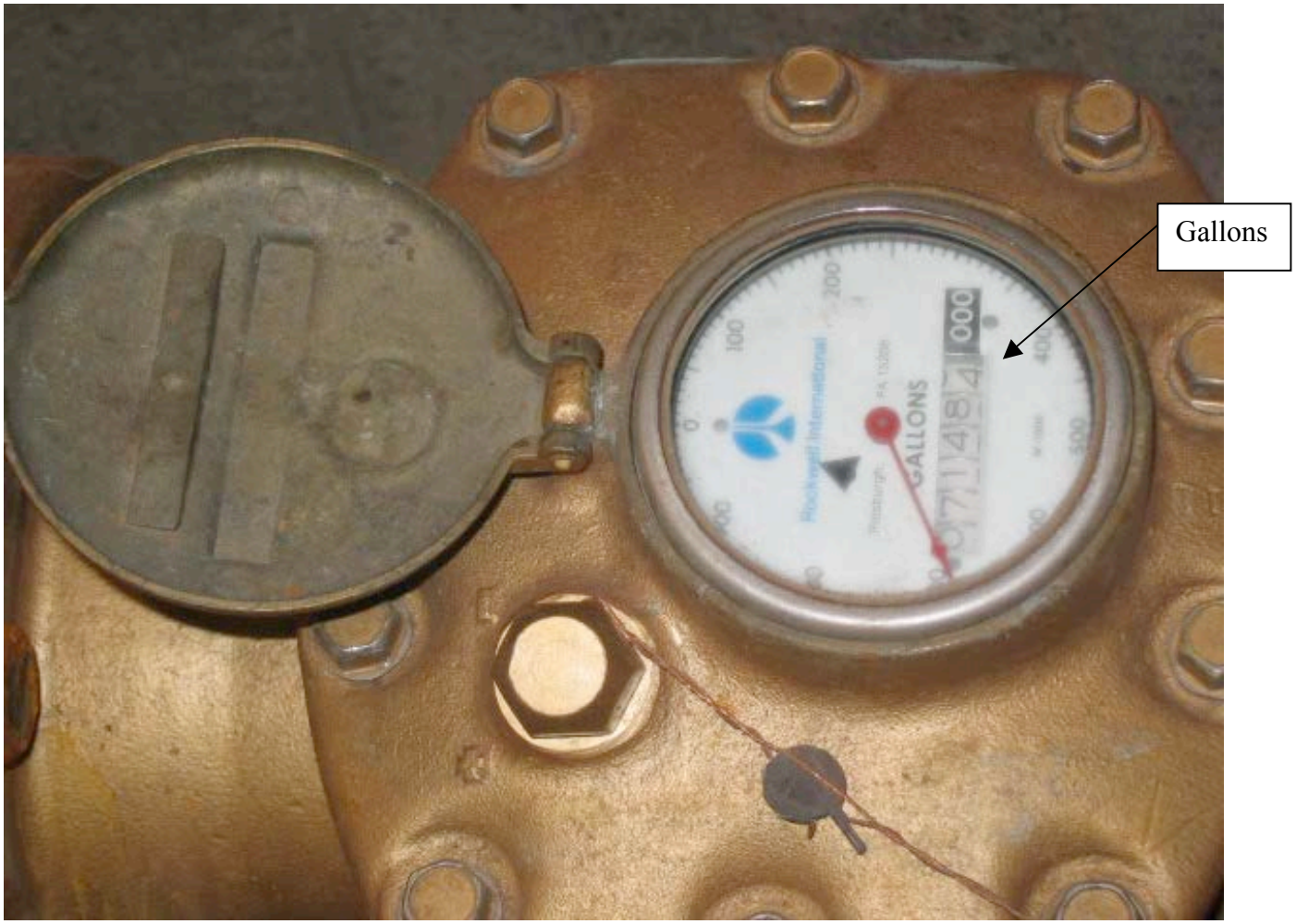
BOOSTER STATION- ***Sump Pump***

WELL HOUSE #1

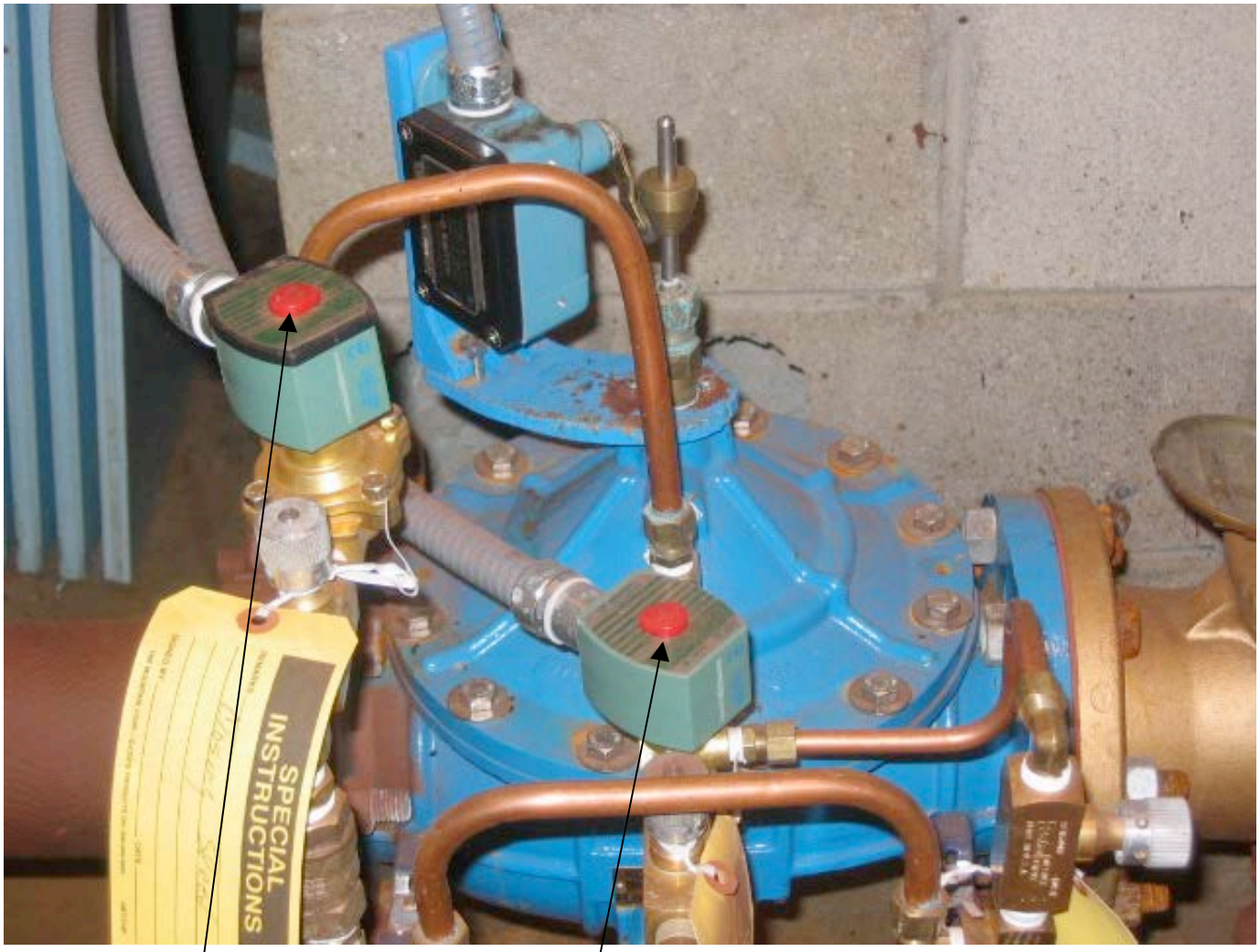


WELL #1

WELL #1- ***Flow Meter***



WELL #1- ***Solenoid Controls***



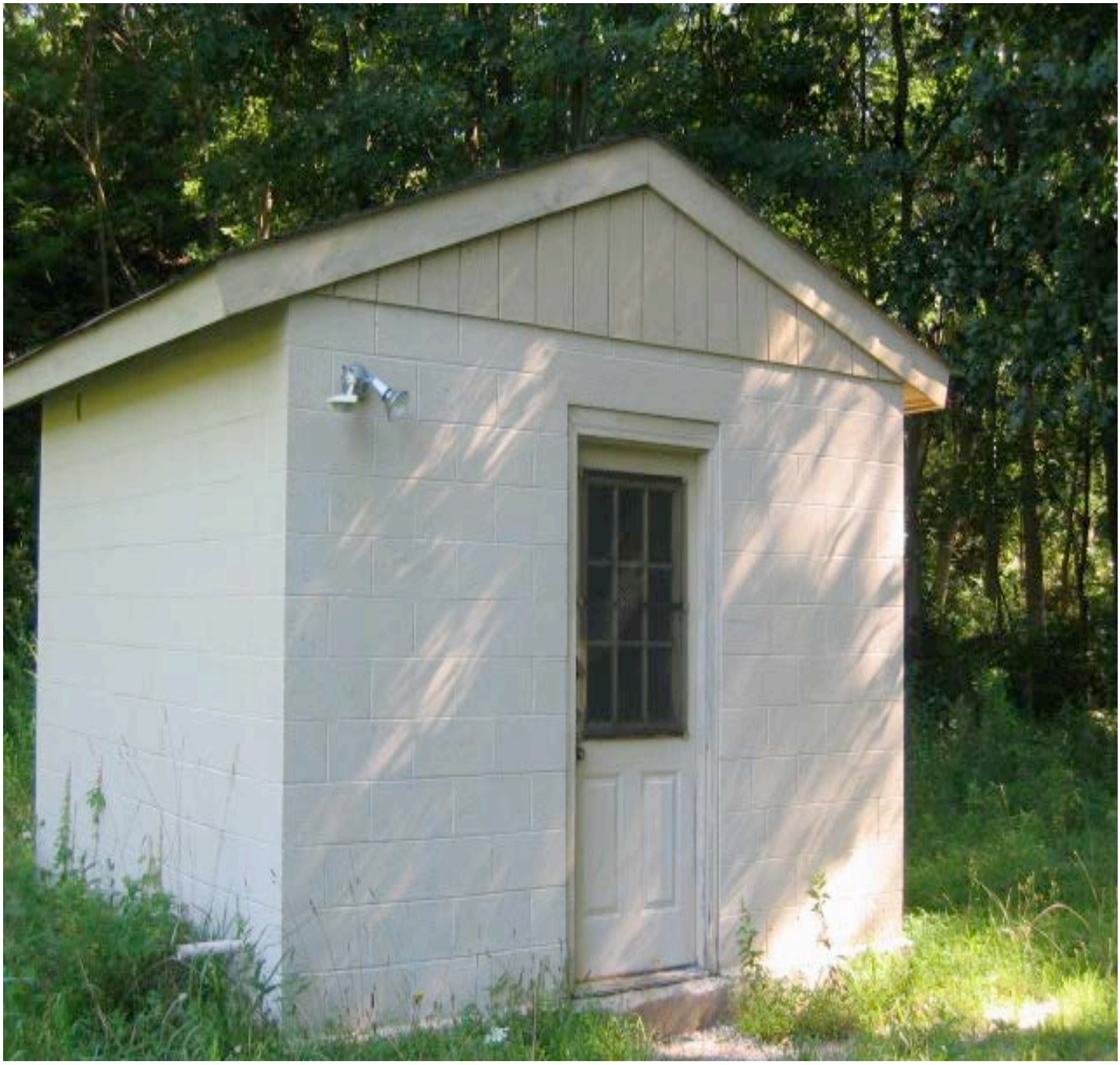
WELL #1- ***Chlorination Tank & Pump***

WELL #1- ***Water Pressure Gauges***

WELL #1- ***Control Panel***

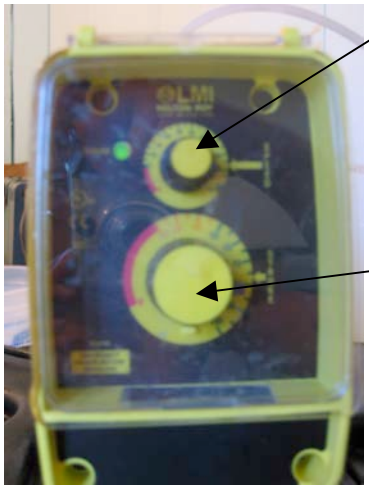
WELL #3- Inactive
(Capped & Located in Well House #1)

WELL HOUSE #2
Lock Combination: 0980

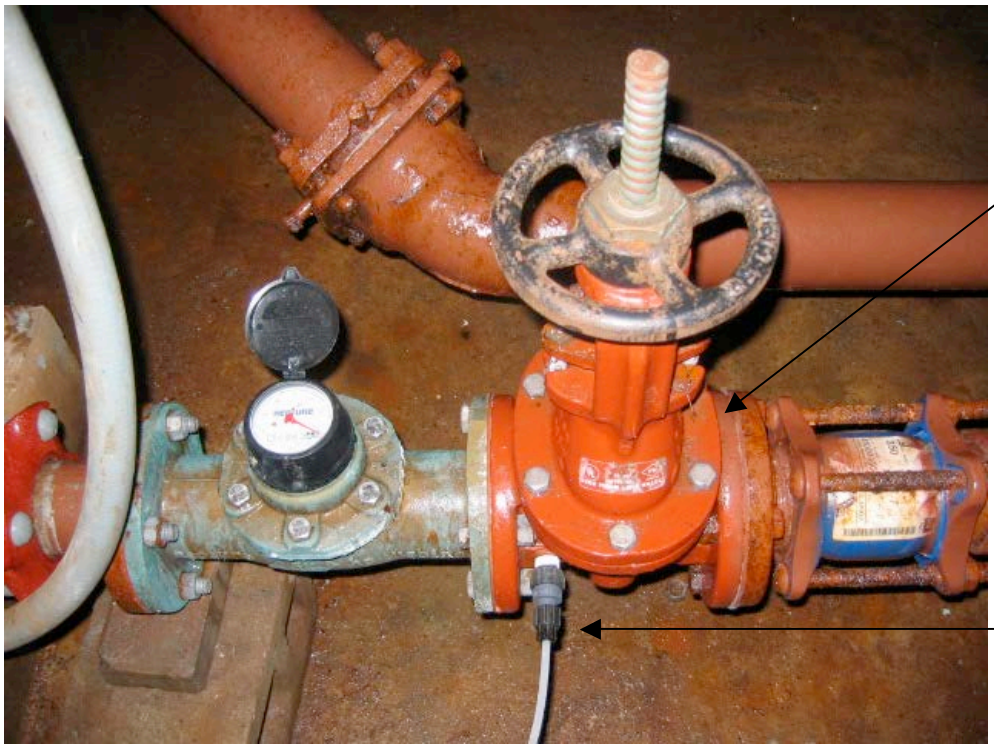


WELL #2- ***Chlorination Tank & Pump***

Chlorinator Pumps

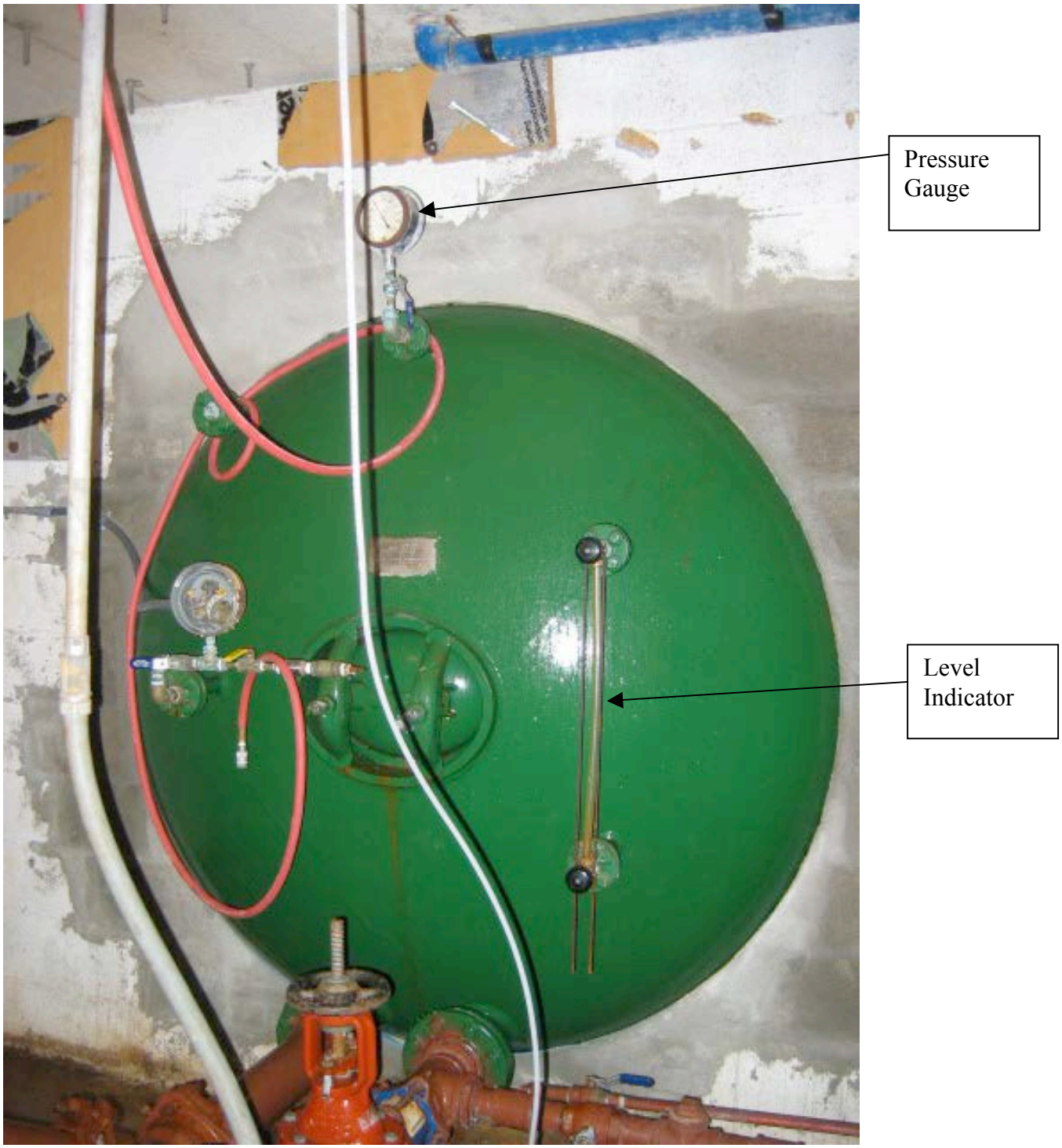


WELL #2- ***Flow Meter, Isolation Valve and Chlorine Injector***



Neptune Flow Meter

WELL #2- ***Expansion Tank***



WELL #2 – *Sump Pump*

WELL #2- ***Electrical Panel***