

MARYLAND

- **Water Treatment Plant Inspection Report Form**

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Public Drinking Water Program
Water Treatment Plant Inspection Report

PWSID #: _____ Name: _____
 County: _____ Plant Class: _____

Inspection Class: _____ Inspected By: _____ Date: ___/___/___
 Problem: Y/N Follow-up Letter Sent: Y/N Follow-up Inspection Scheduled: Y/N

System Information Type (FRDS): _____ Total # POEs: _____
 # Raw Sources: _____ Source Type: GR SU SP PG PS
 # Connections: _____ Metered: Y/N Population: _____
RESIDENTIAL NON-RESID. OTHER
 Mailing Address: (STREET) _____
 (CITY) _____
 (STATE) _____ (ZIPCODE) _____
 System Contact: _____ Title: _____
 Telephone #: (____) _____ Fax #: (____) _____
 System Owner: _____ Telephone #: (____) _____
 Interconnected To: _____ Reason: PURCHASE SELL EMERGENCY

Plant Information POE #: _____ Plant Status: ACTIVE/INACTIVE New Treatment: Y/N
 Plant Address: _____
 Plant Contact: _____ Telephone #: (____) _____
 Average Daily Flow: _____ MGD Design Capacity: _____ MGD
 Raw Source(s): *In-service:* # Ground: _____ # Surface: _____ # Spring: _____
On-standby: # Ground: _____ # Surface: _____ # Spring: _____
Out-of-service: # Ground: _____ # Surface: _____ # Spring: _____
 Treatment: Aeration \ Pre/Post-Disinfection \ Disinfection \ Coagulation \ Flocculation \
 Sedimentation \ Filtration \ Corrosion Control \ Fluoridation \ Iron Removal \ Other
 Chemicals Added: _____

Operating Agency: _____

	CERTIFIED(Y/N)	CLASS	NO.
Superintendent: _____	_____	_____	_____
Operator(s): _____	_____	_____	_____
Other: _____	_____	_____	_____

Comments/Recommendations: _____

INSPECTION INFORMATION

FLOW MEASUREMENT:

Identification					
Meter Type					
Units					
Present Reading					
Previous Reading					
Date					

PLANT MONITORING:

Parameters	Method	Frequency	Location	On-Site Test	On-Site Location
pH					
Free Cl ₂					
Total Cl ₂					
Iron					
Fluoride					
Turbidity					
Other					

OPERATION AND MAINTENANCE

Part 1 - Management

	S	US	NA	Comments
Plant Safety				
Record Keeping				
Laboratory Control Tests				
Maintenance Log				
Customer Complaint Log				
Emergency Response Plan				
Preventative Maintenance				
Staffing				
Other				

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Chemicals Added: _____

PWSID #: _____
 System: _____

OPERATION AND MAINTENANCE

Part 2 - Water Source(s)

	S	US	NA	Comments
Quantity				
Quality				
Protection				

Part 3 - Treatment Processes

	Method	S	US	NA	Comments
Screening					
Aeration					
Pre-Disinfect					
Post-Disinfect					
Disinfection					
Mixing					
Coagulation					
Flocculation					
Sedimentation					
Filtration					
Corrosion Ctrl					
Fluoridation					
Iron Removal					
Taste & Odor					
Other					

Part 4 - Distribution System

	S	US	NA	Comments
Pressure				
Cross Connection Prevention Plan				
Storage				
Flushing Program				
Other				

OPERATION AND MAINTENANCE

Part 5 - Maintenance

	S	US	NA	Comments
Spare Parts Inventory				
Instrument Calibration (eg. chemical feeders, meters, gauges, etc.)				
Sludge Removal				
Other				

PLANT SCHEMATIC:

PWSID #: _____
 System: _____

WELLS

INSPECTION	Well #__	Well #__	Well #__	Well #__
Well Location (eg. outside): Protected?				
ADC Map Coordinates (pg/grid):				
Well Tag? (Y/N) Tag No.:				
Casing Height Above Ground (ft):				
Run Time (hrs/day): Time Metered? (Y/N)				
Raw Water Sample Tap? Before check valve?				
Finished Water Sample Tap?				
Well Vented? Screen?				
Well Cover/Seal Tight?				
Check Valve?				
Blowoff Valve?				
Pitless Adaptor? (Y/N)				
WELL COMPLETION REPORT	Well #__	Well #__	Well #__	Well #__
Year Drilled: Original Well Driller:				
Well Depth (ft):				
Aquifer: Confined? (Y/N)				
Casing Diameter (in):				
Casing Depth (ft):				
Pump Type (S*/T/J): *Pump Depth (ft):				
Pump Intake Level (ft):				
Rated Pump Capacity (gpm):				
Pumping Test rate/time(gpm/hrs):				
Static Water Depth (ft):				
Drawdown (ft):				

*E: If current information available, do not use Well Completion Report data

List all sources for the information (e.g. past inspection, well data table, etc.) noting any discrepancies:

WELLS

GENERAL INFORMATION

1. What directly controls well pump operation? (eg. storage tank pressure)

2. Do wells operate together? Explain.

3. List potential sources of contamination (eg. farmland, septic fields, fuel tanks) in the well's vicinity:

4. Are the wells subject to flooding? If yes, what is the flood level? (NOTE: Well casing should terminate at least 18" above flood level)

5. Have the wells been evaluated to determine whether they are under the influence of surface water? If yes, what do the results indicate?

6. Have any wells ever tested positive for total coliform and/or fecal coliform? Please describe.

WELLHEAD PROTECTION

If the system has a Wellhead Protection Program (WHPP), please check the following:

- a. Designation of the Wellhead Protection Area (WHPA)
 - Map of the WHPA (generally 1/2 to 1 mile radius around well)
- b. Potential contaminants are identified and located
 - Land use divided into: residential, agricultural, industrial, commercial
- c. Management of the WHPA
 - Regulatory controls (eg. zoning)
 - Non-regulatory controls (eg. public education; ground water monitoring)
- d. Future planning
 - Potential future problems identified
 - Contingency plan for alternate water supplies in the event that water supply is disrupted by contamination or other events
 - New wells sited carefully

WELL AREA SCHEMATIC

SURFACE WATER

GENERAL INFORMATION

1. Source: _____
2. Location: _____
3. # Reservoirs: _____ Volume: _____ gals
4. Total # intakes: _____ Intake level(s): _____ ft
5. # intakes used during normal operation: _____
Reason for selecting a particular intake: _____
6. Maintenance schedule for intakes (eg. how often screen inspected; how often debris removed): _____
7. Is the area around the intakes restricted (eg. swimming, powerboats) for a radius of 200 feet? _____
8. Are there any sources of pollution in the proximity of the intakes? Specify. (eg. waste water discharges, marinas, boat launching ramps, sewers, construction projects, animal pasturing, chemically treated agricultural land, chemical storage areas (eg. highway de-icing salt or petroleum products)) _____
9. Is the source adequate in quantity and quality to meet current and future (10 or 20 year) demands? _____
10. Are pre-treatment chemicals applied in the reservoir? If yes, please describe. _____
11. Conditions which cause water quality fluctuations (eg. stratification, algal blooms, ice formation): _____
12. Type(s) of raw water testing: _____ Frequency: _____
13. Is there a dam? If yes, is it inspected for safety? _____
14. Raw water quality (ranges): pH _____ Turbidity _____ Temperature _____

WATERSHED PROTECTION

1. What is the nature of the total watershed (eg. industrial, agricultural, forest, residential)? Give %.
2. What is the size of the owned/protected area of the watershed?
Zoning restrictions and ordinances?
3. How is the watershed managed/controlled? (eg. ownership with restricted access, ordinances)
4. Has management had a watershed survey performed?
5. Is a list available with all upstream users and dischargers?
6. Is there an emergency spill response plan with potential spill sites identified?
7. What arrangements are in place with other owners in the watershed?

PWSID #: _____

System: _____

SPRINGS

1. Name:
2. Location (Please include ADC map page & grid):
3. Type (gravity or artesian):
4. Is the recharge area protected?
5. What is the nature of the recharge area? (eg. industrial, agricultural, forest, residential)?
6. Is the site subject to flooding?
7. Is the collection chamber properly constructed:
 - a. watertight?
 - b. impervious and locked tank cover?
 - c. exterior valve on drain?
 - d. drain screened at end?
 - e. drain apron for overflow discharge to prevent soil erosion?
8. Is the site adequately protected from stray livestock and tampering (eg. fence, locked covers, warning signs)?
9. Is there a surface drainage ditch uphill from the source to intercept surface water runoff and carry it away from the source?
10. Has the spring been rehabilitated to protect from surface water influence?
If yes, please explain what was done.
11. Has the system performed sampling according to PDWP sampling protocol? (eg. rainfall event sampling and dry weather sampling for pH, coliform, turbidity, and temperature)
If yes, what do the sampling results indicate? Explain.
12. Has the spring been evaluated to determine whether it is under the influence of surface water? Explain what was done.
13. Has the system conducted tracer studies?
If yes, what do the results indicate?

STORAGE

HYDROPNEUMATIC TANK

Identification			
Location			
Total Size (gal)			
Operating Pressure Range (psi)			
Effective Storage (%)			
Protection from Vandalism?			
Exterior Condition			
Sightglass?			
Alarm?			
Bypass?			
Pressure Relief Valve?			
Drain? Size.			
Air Compressor? Manual or Automatic?			

ELEVATED AND/OR GROUND STORAGE

Identification			
Location			
Capacity			
Operating Range (ft or psi)			
Covered?			
Drain? Size.			
Altitude Valve?			
Pumped or Gravity Floating on the System?			
Vent Screened?			
Overflow: Termination Point Screened?			
General Condition Interior Coating NSF/ANSI Approved?			
Type/Frequency of Inspections			
Able To Isolate From Rest of System?			
Manhole Watertight and Locked?			
Protection from Vandalism?			

Are there provisions for maintaining water supply when storage out-of-service? If yes, please describe.

DISTRIBUTION

1. List all distribution materials (mains *and* service lines), percent of each, and the diameters.
 2. Frequency of main breaks:
 3. Pressure testing program?
 4. Flushing program?
 5. Valve maintenance program?
 6. Disinfection after repair?
 7. Repair materials available?
 8. Dead ends?
-
-

PUMPS

1. Total # pumps: _____
in service: _____
out-of-service: _____
on-standby/backup: _____
 2. Type (eg. high service):
 3. Rated capacity (hp and/or gpm):
 3. Application (eg. chemical feed):
 4. Location:
 5. Type and amount of lubricant:
 6. Condition of equipment:
 7. Protection of equipment (eg. protective guards on rotating parts):
 8. Emergency/backup systems?
 9. Preventative Maintenance (PM) program?
-
-

ADDITIONAL NOTES

MIXING

1. What chemicals are added at the mixing basin?
 2. Is there any noticeable short circuiting?
 3. Where is the mixing basin located?
 4. What type of mixer is used (eg. motorized, baffles, etc.)? If a motorized mixer used, is it variable speed?
 5. What is the condition of the mixer?
 6. Does the plant require shut-down in order to make repairs to the mixer?
-

COAGULATION

1. What chemical is used for coagulation?
 2. Where is the chemical added?
-

FLOCCULATION

1. Number of flocculation basins:
 2. Are baffles used? If yes, how many?
 3. Is a mechanical flocculator used? If yes, what type? Is it shearing the floc particles?
 4. What is the appearance of the flocculated particles?
 5. Is there an even distribution of floc?
 6. What is the condition of the flocculation equipment?
-

SEDIMENTATION

1. Number of sedimentation tanks: Size (gal): Surface Area (ft²):
2. Are tube settlers or inclined plates used? If yes, describe condition.
3. Does the floc settle out properly?
4. Is the flow through the tank smooth?
5. Is the flow over the weir even throughout the tank?
6. Sludge: How is the sludge collected and removed? How often? By whom?
 What is the condition of the removal equipment?
7. Can the unit(s) be taken out of service for inspection and repair?

FILTRATION

1. Total number of filters:
2. Number of filters used at a time during normal operation:
3. Average filter rate (gpm)?
4. Is the flow equal through all filters? Y or N
5. Type of filter(s) (eg. pressure, rapid sand, etc.):
6. Filter media used:
7. Filter aids used:
8. Backwash Cycle:
 - a. Does the plant shut-down when the filters backwash? If not, is the raw water flow reduced?
 - b. Do the filters backwash at the same time?
 - c. Where does the water to backwash filters come from? Is it metered? Gravity or pumped? If pumped, are there back-up pumps for backwashing?
 - d. Where does the backwash water go to?
 - e. Is recycle used? If yes, describe point where re-introduced in plant and any additional treatment.
 - f. Is the cycle automatic or manual?
 - g. What determines when backwashing will take place (eg. headloss, turbidity, time)?
 - h. Duration of cycle (from draining to putting back on-line):
 - i. Is there surface wash or air scour? If yes, describe: type, source of water/air, pressure, duration, and condition of equipment.
 - j. What is the bed expansion (%)?
 - k. What is the backwash rate (gal/min/ft²)? NOTE: ft² refers to the filter surface area.
9. Are filter-to-waste procedures followed after backwash? Does the plumbing allow for filter-to-waste?
10. What are the procedures when filter put back on-line after backwash (eg. slowly increase filter rate)?
11. What are the procedures for plant start-up (eg. backwash filters; filter-to-waste)?
12. Are there obvious problems with the filter(s) (eg. mudballs, media cracking, uneven bed expansion)?
13. For surface water plants:
 - a. Are influent and effluent turbidity measurements taken from each individual filter?
 - b. Are the turbidimeters cleaned and calibrated regularly?

LIQUID DISINFECTION

Check all that apply: Pre-disinfection Post-disinfection Disinfection

1. Chemical used: *Brand Name:* _____
NSF Approved? Y/N *Chemical Name:* _____
 Concentration: _____
2. Is it purchased as a liquid solution or as a dry powder? _____
3. What is the dilution ratio and/or concentration of the chemical feed? _____
4. Is an adequate residual being maintained? Y/N
5. Location of disinfectant injection point(s): _____
6. Is there a day tank and/or mixing tank? Y/N. Size: _____ gal. How often filled? _____
7. For systems with alternating wells and one chemical feed pump, is the feed rate adjusted for each well (eg. if wells have different pumping capacities)? Y/N
8. Is the disinfectant dosage automatically adjusted according to variations in water quality or quantity via flow-paced equipment or streaming current detectors? Y/N

If no, are manual adjustments typically made? Y/N
What is the basis for the adjustments (eg. residuals)?
9. Describe chemical feed/injection equipment:
Equipment condition:
Are the feed equipment and line accessible for repairs? Y/N
10. What determines when chemical is fed (eg. well pump signals feed pump)? _____
11. Is operational stand-by/back-up equipment provided? If not, are critical spare parts available?
12. Chemical storage:
Amount: _____ *Location:* _____
Adequate/safe? _____ *Purchase/refill sched:* _____
13. Are proper safety precautions being taken in the handling of the chemicals? (eg. gloves) Y/N
14. Is there a Preventative Maintenance program? Y/N
15. Chlorine storage and feed equipment area(s):
a. Isolated from other areas? Y/N b. Heated? Y/N
c. Ventilated? Y/N d. Warning sign on door? Y/N
e. Exhaust fan and light switches outside bldg.? Y/N
16. Is there a continuous chlorine analyzer? Y/N
17. For surface water systems, has the chlorine contact time ever been calculated? Y/N. Is it sufficient?

