Sanitary Surveys: Facility Surveys
LA DHH/OPH

Purpose of Sanitary Surveys

• Identify at – risk systems
  – Ensure operational, monitoring, reporting and recordkeeping practices are in compliance with drinking water regulations
  – Identify any significant deficiencies
  – Better ensure safe drinking water is distributed to the public

• Review of water source, equipment, facilities, and treatment procedures
Survey Types

- Sanitary Survey
- Enforcement Survey
- Physical Inspection – Site Visit
- Capacity Development
- Engineering Survey

Sanitary Survey

- A complete fact finding, information gathering and physical inspection of a public water supply

- Referred to as a Class I Sanitary Survey
Enforcement Survey

- Can be requested by the State or EPA
- A Class I Sanitary Survey conducted in response to an uncorrected significant deficiency, violation, or a series of violations
- Post Order Investigation is conducted after the violation(s) or significant deficiency has been corrected by the water system

Physical Inspection

- An information gathering and inspection tour of the physical facilities of a water supply only
- Referred to a Class II Sanitary Survey
### Capacity Development

- A physical inspection and fact finding tour of a water system supply’s facilities in order to make financial and managerial recommendations or findings

- Looks more at income/expense records and managerial procedures

- State Revolving Fund (SRF) Department
  - Low-interest loan program

### Engineering Survey

- A physical inspection and fact finding tour of a water system supply’s facilities in order to make engineering recommendations or findings
Sanitary Survey Frequency

- Surface Water – Every year
- Ground Water Under the Influence – Every year
- Ground Water Systems – Every 3 years

Regulations

- Safe Drinking Water Act Code of Federal Regulations
- Louisiana Administrative Code
  - Title 51 Part XII – Water Supplies
  - Title 56 Part I – Water Wells
    - http://doa.louisiana.gov/osr/lac/books.htm
  - www.hes.org
8 Elements-Class I Sanitary Survey

1) Source
2) Treatment
3) Distribution system
4) Finished water storage
5) Pumps, pump facilities & controls
6) Monitoring, reporting, & data verification
7) Water system management and operation
8) Operator compliance with State requirements

1) Sources

Protecting the Source prevents contaminants and pathogens from reaching consumers

- Source Water Quality and wellhead protection
- Source quantity and capacity
- Well construction
- Well locations
- Potential sources of contamination
- Source water transmission mains
- Setback Distances
- Site Security & General housekeeping
Water wells

**Vertical Turbine**  
**Submersible**

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If no bolts, possible opening through gasket and gasket not flattened enough to form tight seal.
Flow Meter

Indicating – flow rate

Totalizer – number of gallons per day

Pressure gauge

Vertical turbine motor
- packing gland
very little leak
Raw Water Collection Point

• Smooth nozzle tap

• Installed prior to the required check valve

• Primary Drinking Water Regulations
Well Review

- Well log and characteristics
  - Flow and well yield
  - Depth
  - Material

- Aquifer protection
  - Sanitary seal
  - Secure casing
  - Grouting

- Security
  - Fencing, locks, etc.
  - Contamination

- Well Maintenance
  - Casing condition
  - Site maintenance

- Electrical
  - Secure
  - Organized

Grouting Of Wells

The Annular Space Between The Well Casing And The Bore Hole Shall Be Sealed With Cement-Bentonite Slurry Or Neat Cement.
Main Components. Good condition.

- Sample Tap
- Flow Meter
- Check Valves
- Pipe Supports
- Well Seal
- Support Base
- Air Relief Valve
- Electrical Wiring

Yard clean. Properly graded to drain water from well.

Surface Water Intake
Source Information

- Water body (flowing vs. not-flowing)

- Basic make-up of the water
  - Turbidity
  - pH

- Pumps
  - How many?
  - Types
  - Capacity

Intake Pipe

- Where is Intake
  - Near shore or middle of reservoir
  - Near surface or bottom of reservoir
  - Multiple intakes

- Is Pipe Screened
  - Intake pipe screened
  - Area around pipe screened

- Where are sources of contamination
Pumping Facilities at Intake

- Fenced / Protected
- Pumping Equipment
- Operator accessibility
- Maintained

Purchase

- Master Meter where connected to Seller
- Booster pumps
- Post treatment (chlorination boost)
- Storage
- Written contract with Seller
- Operator certified Production and Distribution
2) Treatment

- Varies based on water quality of the source
- Application of treatment chemicals
- Redundant mechanical components where treatment is required
- Cross-connections with treatment systems
- Monitoring of treatment systems

Records

- Amount of chemicals used
- Which chemicals used
- Injection rates
- Amount of water treated
- Water quality before and after treatment
- Flow rate through plant
- Diary of all procedures used
- Any unusual incidences
Chlorine Residual Reports

- Free chlorine residual tested every day: weekends, holidays, vacations, etc.
- Daily residuals kept on approved form
- Maximum chlorine residual tested monthly with Routine bacteriological samples.

Chemical Addition
Valve wrench should be on the bottle in use

Cylinders secured

What's missing?

No scales

Cylinders not in building. Protect from weather, heat & cold, accidental bumping, theft

DANGER CHLORINE

01/31/2007
Keep out of the weather

Chemical feed pump above tank

Chlorine vent lines must go to outside. Must be screened.

Scales or auto-switch over? How often does operator check cylinder?

Lead O-rings & ammonia bottle should be nearby our easily accessible
What Goes Where? When?

Chemical Feed Requirements

Phosphate and Chlorine

Phosphate line

Chlorine line

x 16
Chemical Labels

Pipe Labels
Chemicals and Pumps

- Are they compatible?

3) Distribution System

- Upkeep and maintenance of pipes
- Paper review of schematics
- Operation and maintenance records
- Operating Procedures, construction standards
- Distribution system water quality data
Records

- Pipe sizes
  - Plan documents
  - Locations

- Distribution components
  - Valves (Gate, Flush, etc.)
  - Fire Hydrants
  - Sample Taps
  - Dead-ends

- Pipe Material
  - Asbestos Cement
  - PVC (poly-vinyl chloride)
  - PE (poly ethylene)
  - Cement

- Data
  - Chemical data (Chlorine)
  - Pressure data

Distribution Review

- Maintain proper pressure and flow
  - The minimum for the State is 15 psi
  - Maintain adequate flow to reduce buildup in pipes

- Elevations
  - Pressure inversely proportional to Elevation
  - If terrain varies greatly, test psi at highest / lowest areas served.

- Flushing Program
Sample Taps

- Source of your bact. samples
- Choose sites wisely
- Secure sites
- Maintain the sample taps

Unapproved Sample Taps

- Swing-neck tap
- Mixing faucets
- Vacuum breakers
- Leaking faucets
- Fire hydrants/flush valves
- Upstream of treatment devices
Approved Sample Taps

- Smooth-Nozzle tap
- 12 inches above any surface
- Located away from potential exterior contamination

Cross-Connections

A connection between a supervised potable water supply and an unsupervised supply of unknown quality
### Cross Connection Protection

<table>
<thead>
<tr>
<th>Condition</th>
<th>Protection Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back flow</td>
<td>Air Gap</td>
</tr>
<tr>
<td></td>
<td>Reduced Pressure Principle Backflow Preventers</td>
</tr>
<tr>
<td>Back Siphonage</td>
<td>Double Check Valve Assembly</td>
</tr>
<tr>
<td>Back pressure</td>
<td>Atmospheric Vacuum Breakers</td>
</tr>
</tbody>
</table>

### Likely Places For Cross Connections

- Hospitals and Medical Bldg
- Mortuaries and Morgues
- Sanitariums and Nursing Homes
- Laundries and Dye Works
- Waste Water Treatment Plants
Cross Connection Protection

• Back-flow and back siphonage protection devices shall be tested annually
  – Louisiana licensed plumber certified in BFP device testing
  – Records of the results of the testing shall be kept by the water system

• Components shall not be placed below grade

4) Finished Water Storage

• Access tank integrity
• Access ways and safety
• Screens, overflow and bypass piping
• Site security
• Maintenance Checks
• Operation & Maintenance Procedures
  – Internal cleaning
  – Disinfection of tanks
**Storage tanks**

- Capacity – usable volume
  - External gauge
  - SCADA system
  - Water age and

- Inlet and Outlet Orientation
  - Single inlet/outlet
  - Separate inlet/outlet

- Structural Integrity

- Material and painting (internal & external)

**Tank Vents and Manholes**

- Vents
  - Prevent the entrance of surface water and rainwater
  - Shall prevent the entrance of birds, animals, insects and dust
  - Shall be installed at least 24 inches above the roof and covered with a mesh non-corrodible screen

- Manholes
  - Shall be framed at least 4” above the roof at the opening and fitted with a solid watertight cover which overlaps down around the frame at least 2”
  - Shall have a locking device
Tank Overflow

- Recommended that overflow diameter be one size larger than inlet and outlet of the tank
- Not acceptable as the vent for the storage tank
- No overflow may be connected to a sewer or a storm drain

Screened or Flap

12” to 24”

Ground – erosion protection
Hydropneumatic Tank

- Hydropneumatic tanks combine energy from a pump with the principle of air pressure to force water into the distribution system.
- Not recommended for fire protection
- Size limits number of customers you can serve

Hydropneumatic Tank

- Cut-in Pressure vs. Cut-out Pressure
- Cycle Repeats
- Air:Water = 1/3 air to 2/3 water
- Cycle Rate - Number of times the pump starts and stops in one (1) hour
- Sight tube
  - Protect from freezing
  - Clean, not clogged
5) Pumps, Pump Facilities & Controls

- Proper working order and best fit

- Pump information
  - Pump tests
  - Pump capacity
  - Maintenance schedule

- Emergency Power

- Remote monitoring controls and alarms

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**Pumps**

**Types**

- Centrifugal
- Hand pump
- Jet pump
- Positive Displacement
- Submersible
- Vertical Turbine

**Uses**

- Intake
- Transfer
- Service
- Booster
- Chemical Feed
Generators

6) Monitoring, Reporting, & Data Verification

- Chemical Data
  - Organic Data
  - Inorganic Data
- Radiological Data
- Lead and Copper
- D/DBP
- Total Coliform Rule
- CCR
- LAC 51:XII
- Variances
- Plans Current
- Inspection Reports
- Violation
  - Actions to Correct Violations
  - Public Notification Verification
- Responses
- Chlorine Residual Reports
- Calibration Tests
- Backflow Device Test Results
- Chlorine Dioxide Residuals
Record Keeping

- Chlorine Residuals - 3 years

Record Keeping

- Bacteriological Results - 5 years
Record Keeping

- Chemical Analysis - 10 years
- Chemicals used for treatment

Record Keeping

- Your Lab Reports - 10 years
  - Iron / Manganese Removal
  - pH / Corrosion Control
  - Surface Water Treatment Rule
Record Keeping

- General Correspondence - 10 years
- Survey Letters, Plans Approvals
- Requests For Information
- Your Letters to DHH

7) Water System Management and Operation

- Administrative Contacts
  - Owner / President / Mayor
  - Boardmembers / Aldermen

- Contact information

- Has any attended management class?
POC Sample Site Plan

Point of Collection
Bacteriological (Bact.) Sample Sites
Lead and Copper
D/DBP Plans

Amend Contact Info

• Update legal contacts
  – Addresses
  – Phone numbers
• Update population
• Sufficient staffing

• Contacts
  – Administrative contact
  – Designated operator
  – Certified operator
  – Legal contact
  – Emergency contact
8) Operator Compliance with State Requirements

- Have certifications displayed
- Must be properly trained based on system type, size and treatment
- Properly certified for roles and responsibilities
- Certifications are current and properly maintained
  - Training Hours
  - Experience

SWIFT – Safe Water Information Field Tool

- Electronic sanitary surveys
- Allows the State to more effectively track deficiencies/observations identified during the survey
- Allows State to provide a more uniform approach to conducting surveys across Louisiana
  - Required fields
  - Better reporting to the system
- Allows the State to maintain schedules for follow-up activities
Survey Outcome

- Identify deficiencies/observations and determine their severity
- Provide written notification to the system of the issues and may specify corrective action(s) needed to be completed by the system
- Outline timeline in which the system has to take corrective actions and notify the State that action has been completed
- Failure to comply with the required corrective action will result in a Treatment Technique Violation

Engineering Services

Metro Region I – New Orleans  
504-599-0101

Capitol Region II – Baton Rouge  
225-925-7230

Teche Region III – Thibodaux  
985-447-0920

Acadian Region IV – Lafayette  
337-262-5311

Southwest Region V – Lake Charles  
337-475-3200

Central Region VI – Alexandria  
318-487-5262

Northwest Region VII – Shreveport  
318-676-7470

Northeast Region VIII – Monroe  
318-361-7201

Southeast Region IX - Mandeville  
985-871-1300