

## DOCUMENT MANAGEMENT SYSTEM

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Doc# NSCS-M-P-7091-07  
 Title: pH Testing, pH Bird Baths, pH Cross Checks  
 Issue Dt: 05/30/2002  
 Revision Dt: 07/23/2018 Review Interval: 12  
 Cat: Quality Doc Type: SOP  
 Auth:  
 Desc: pH Testing, pH Bird Baths, pH Cross Checks  
 Loc: Midwest - Utilities-Midwest - Plant Maintenance-Midwest-Gary Works

**STEPS**

## Process Overview

**PROCEDURES**

pH testing with on-line and off-line equipment is the most significant control variable the Operator must maintain at the Final Treatment Plant. Failure to properly control the pH will result in the treatment plant being upset.

The normal pH control point available to the Operator is at the mix tank chemical feed system. See NSCS-M-P-7091-10 for full details. However, during an emergency the Operator can manually feed chemicals at Outfall 104 to control the final effluent pH at Outfall 104 and 004.

Normal plant operation uses on-line pH instrumentation which is recorded for the equalization basin effluent, the mix tank effluent (a duplex pH system), and Outfall 104. Also, a visual pH instrument is available for the west mix tank. The **only** automatic chemical feed control at the Final Treatment Plant is via the mix tank effluent duplex pH control system. This system can control the lime slurry feed via the roto-dips or the sulfuric acid feed if it is turned on. This system controls the mix tank and can be reviewed in SOP NSCS-M-P-7091-10.

On-Line and Off-Line  
Probe Cleaning

On-line pH equipment is cleaned by the Operator and calibrated by the IR Shop. Off-line portable equipment is buffered and cleaned by the Operator and electronic failures are repaired by the IR Shop. See NSCS-M-P-7091-02 for information reference on-line pH probe cleaning by the Operator. On-line probes should be cleaned on an as needed basis but not less than once per turn.

## pH Cross Check

The on-line pH probes should be checked against the potable pH probes a minimum of twice per shift. The best time to cross-check the probes is after they have been cleaned. To cross-check the probes, secure a grab sample from the birdbaths or outfalls, test the pH and compare it to the on-line meter. Then record the results on Form 7091-001. If the pH's vary by more than .5 pH units check all equipment, secure additional samples as needed and notify the IR Shop.

**pH Cross-checks:**

**Frequency of cross-check:** minimum twice per turn  
**Variance for maintenance:** not more than 0.5 pH between on-line and off-line

pH Test Procedure and  
Data Recording

The following test procedure should be used when testing pH with a portable pH meter.

1. Inspect the meter for obvious damage or problems.

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2. Turn on the instrument.
3. Rinse off the pH electrode and blot with paper.
4. If probe and meter need buffered, go to Step 5. If the meter does not need buffering, place the probe in the sample to be tested and press the pH key. Record the results on Form #7091-001 or in the Final Treatment Plant log sheet depending on what was tested. Be sure to rinse off the probe and store it turned off, out of service in water, deionized water is preferable but not required.
5. If the pH probe and meter need buffered:
  - insert probe into a 10.0 buffer;
  - press calibrate button;
  - allow reading to standardize;
  - remove probe from 10.0 buffer, rinse off and blot with paper;
  - insert pH probe in 4.0 buffer;
  - press calibrate button;
  - allow reading standardization;
  - remove from buffer, rinse and blot with paper;
  - insert probe into sample to be tested, record results as in Step 4; and
  - remove probe from sample, turn off meter, rinse, blot and store in water just like in Step 4.

## Corrective Actions

If probes, meters, or buffers are required, contact the Manager. Extra equipment is kept at Pretreat.

Also, see pH cross-check and process overview sections of this SOP for additional information.