

## FEDERAL WASTEWATER FACILITY VIOLATIONS AND PROPOSED EMS SOLUTIONS

In 2005, EPA's Federal Facilities Enforcement Office (FFEO) developed and implemented an integrated strategy focused on improving Federal facility compliance with NPDES wastewater permits. Federal Facility inspection and reporting statistics indicated that federal entities had a compliance rate of over 86 percent for requirements under the Clean Air Act, Resource Conservation and Recovery Act, and Toxic Substances Control Act. Rates of compliance with the Clean Water Act, National Pollutant Discharge Elimination System (NPDES) for wastewater permits, however, were below 80 percent and had been below 70 percent for the past six fiscal years.

To address this area of concern, FFEO worked with other agencies and their affected facilities to identify possible management causes for non-compliance. The goal of the effort was to propose solutions and recommendations to address non-compliance utilizing environmental management concepts, since certain Federal Facilities including those that have large wastewater operations are required by Executive Order to implement an EMS. It is anticipated that this effort will respond to a substantial portion of the non-compliance problem and result in both short and long-term solutions to management-based causes for non-compliance. Ongoing and future inspection and enforcement efforts will support the strategy as both confirmation of the compliance assistance aspects of the strategy and additional incentive for affected facilities to return to, and maintain compliance.

This document presents recommendation for improving environmental management practices in response to specific examples of non-compliance at Federal facilities. It is based on information gathered from Federal agencies and facilities regarding non-compliance with NPDES requirements as well as information presented and discussed at an interagency Workshop held at EPA Headquarters in early 2006. Additional assistance information on this and other environmental compliance topics may be found at [www.FedCenter.gov](http://www.FedCenter.gov).

### AN ENVIRONMENTAL MANAGEMENT SYSTEM APPROACH

An effective EMS should take notice of and investigate the reported non-compliance and respond accordingly to; 1) address any near term adverse environmental impacts caused by the non-compliant situation, 2) determine the cause of the problem that resulted in the non-compliance, 3) provide near term response to correct the non compliance, 4) develop long term solutions that prevent the non-compliance in the future, 4) implement those solutions, and 5) monitor to determine the effectiveness of the solutions. Under certain circumstances where the situation leading to the noncompliance may not have been adequately identified early in the EMS development process or the solutions require significant management attention, it will be necessary to include proposed solutions as part of the management review process to ensure adequate resources are provided to prevent future non-compliance.

## NPDES WASTEWATER NON-COMPLIANCE GROUPINGS

**Internal Operations:** Findings of non-compliance in this category usual are described as the result of “something that didn’t get done properly” or “something that happened when it should not have.” These events often arise from circumstances within the direct control of the wastewater treatment plant and are often directly related to on-site personnel, processes, or equipment. Causes for these findings are most frequently related to a lack of training that ensures competence and/or specialized skills related to plant operation, inadequate operating procedures to ensure oversight of critical processes and inadequate monitoring of existing conditions to ensure excursions from normal limits are detected and addressed quickly. These situations can also arise when significant aspects have not been correctly identified during that phase of management system implementation resulting in inadequate allocation of management attention and resources.

**External Relations:** Findings in this category arise from circumstances that are generally outside of the direct control of the WWTP operation, but certainly within the control of other parts of that organization or entities that interact with and “feed” the facility. These include other operations within the facility, contractors/subcontractors, tenant and host organizations, suppliers and others that may interact with the facility but are managed by an entity external to the facility. Non compliance in these situations is characterized by events that were unexpected and unplanned for by the wastewater plant and are frequently due to the introduction of unexpected substances or volumes in to the waste stream. These situations generally arise when there is inadequate interaction between plant operations and others that are an effluent source to the plant. In most cases there is not a process in place to ensure proper controls exist on the various activities and that those controls are followed. Excursions are particularly common where the activities of others are not part of the “normal” facility operation. In most cases, proper controls have not been placed on those activities as well.

**Planning & Preparedness:** Findings in this category are generated by reasonably foreseeable situations where the WWTP has not anticipated externally generated impacts, or is not otherwise adequately prepared for these impacts. In some cases, these situations range from circumstances where large scale operational changes occur and the wastewater operation infrastructure is not adequately reflected in planning for those changes. They also occur when know, predictable but not frequent events occur such as severe weather. These circumstances may be precluded by ensuring adequate wastewater management planning for known operational changes and likely natural events and circumstances. In cases where events are less likely to occur, preparedness for those events may not preclude non compliance but will allow return to compliance in a timely manner.

**Infrastructure Conditions:** Findings in this category stem from extremely complex, often pre- existing infrastructure circumstances that exist at the wastewater operation and where the affected facility has little or no direct influence over the resolution of these circumstances. These circumstances are generally the result of aging infrastructure and deferred large scale maintenance of the wastewater operation. Resolution of these situations is frequently difficult due to the scale of the problems causing non-compliance. Organizations must avail themselves of opportunities to prevent these circumstances from arising by ensuring that long-term planning recognizes the necessity for capital improvements to preclude large scale systematic failure.

Based on the non-compliance groupings, the tables below present suggested solutions for non-compliance situations identified as part of the NPDES Integrated Strategy. Other solutions may also be appropriate given the circumstances and the proposed solutions may address similar causes on non-compliance. The proposed solutions are provided primarily as examples to allow the reader to understand the relationship between EMS elements and actions taken to return to and maintain compliance with NPDES requirements.

Note – these items are numbered to facilitate discussion

Cause of Violation	Proposed Solutions
<b><i>Internal Operations</i></b>	
<p>1. Chlorine process controller malfunctioned.</p>	<p>1) Ensure that existing inspection and maintenance procedures are appropriate and being followed. (operational control and competence, training and awareness)</p> <p>2) Identify equipment potentially subject to spontaneous failure (aspect review/ identification) and implement more frequent inspections/checks/tests to ensure such equipment is functioning properly. (monitoring and measurement)</p> <p>3) Ensure adequate training, as necessary. (training, awareness and competence)</p>
<p>2. Lack of flow meters and TSS analyzers to alert personnel of need to institute control measures.</p>	<p>4) Identify and install appropriate control measures and mechanisms (operational control, monitoring and measurement) (e.g., flow meters and TSS analyzers) and ensure adequate operational procedures are in place. (operational control)</p> <p>5) Develop written response procedures in the event controls are triggered and ensure personnel are prepared to implement those procedures. (operational controls, emergency preparedness and response)</p>

Cause of Violation	Proposed Solutions
<p>3. Improper operation and maintenance of treatment plant.</p> <p>4. Failure to follow approved test methods.</p>	<p>6) Ensure proper operational controls are in place and staff competency and knowledge and/or training are adequate. (operational controls and training, awareness and competence)</p> <p>7) Ensure staff competency and improve staff knowledge and/or training where necessary. (training, awareness and competence)</p> <p>8) Increase oversight of processes. (resources, roles responsibility and authority and monitoring and measurement and corrective action)</p> <p>9) Revisit operating procedures to ensure that there are no missing or out-dated procedures (objectives, targets and programs) and ensure procedures are implemented (resources, roles, responsibility and authority and operational control)</p>

Cause of Violation	Proposed Solutions
<p>5. Improper placement of a sample collection probe resulted in collection of settled solids.</p> <p>6. Bypass valve corroded resulting in waste discharges without treatment.</p> <p>7. Malfunctioning metering pump resulted in over-dosing.</p>	<p>10) Ensure that existing sampling, inspection, and maintenance procedures are appropriate (<b>operational control</b>) and being followed. (<b>training, awareness and competence and monitoring and measurement</b>)</p> <p>11) Identify critical equipment potentially subject to failure and consider implementing more frequent checks/test to ensure such equipment is functioning properly. (<b>monitoring and measurement</b>)</p> <p>12) Evaluate systems for correcting existing problems to ensure sufficient checks are in place to certify completion. Make sure that root-cause analysis is conducted and followed through to conclusion. (<b>nonconformance and corrective / preventive action</b>)</p>
<p>8. Faulty field pH meter.</p>	<p>13) Identify equipment potentially subject to spontaneous failure and consider implementing more frequent checks/test to ensure such equipment is functioning properly. (<b>nonconformance and corrective / preventive action and monitoring and measurement</b>)</p>

<i>External Relations</i>	
<b>Cause of Violation</b>	<b>Proposed Solutions</b>
1. Failure of the metal plating shop to adhere to existing procedures, develop other procedures, and inadequate training resulted in heavy metal (zinc) exceedances.	1) Increase appropriate oversight of metal plating operations ( <b>resources, roles, responsibility and authority</b> ). 2) Improve communications with and training of metal plating staff ( <b>competence, training and awareness</b> ). 3) Ensure that all appropriate procedures are developed ( <b>operational control</b> ) and any controls are implemented, verified, and relevant staff receive necessary training ( <b>competence, training and awareness</b> ).
2. Industrial user performing pre-treatment sampling was experiencing staff turnover and transition of responsibilities.	4) Increase oversight of contractor operations ( <b>competence, training and awareness</b> ). 5) Improve communications/training of contractor staff ( <b>competence, training and awareness</b> ). 6) Incorporate specific environmental roles and responsibilities into contractual documents ( <b>competence, training and awareness</b> ).
3. pH exceedances due to run-off associated with “unanticipated” rain onto a newly poured concrete slab (by a contractor) in the area.	7) Develop a procedure to cover, or otherwise prevent run-off from activities in the vicinity of the WWTP ( <b>operational control</b> ), irrespective of who initiates the construction ( <b>competence, training and awareness</b> ). 8) Improve oversight of contractor construction activities ( <b>resources, roles, responsibility and authority</b> ).
4. Contractor laboratory was not aware of appropriate detection limit requirements for Silver.	9) Incorporate explicit roles and responsibilities into contract specifications ( <b>competence, training and awareness</b> ).

<p>5. Cross-contamination of effluent samples by contractor laboratory</p>	<p>10) Incorporate more explicit roles and responsibilities into contract specifications (competence, training and awareness).</p> <p>11) Ensure duplicate sampling.</p>
<p>6. Lessee failed to submit required reports in a timely fashion.</p>	<p>12) Improve communication with and, as appropriate, training of tenant organizations (competence, training and awareness).</p> <p>13) Incorporate more explicit roles and responsibilities into lease agreements (competence, training and awareness).</p>
<p>7. Copper discharges from tenant activities.</p>	<p>14) Improve communication with and/or training of tenants (competence, training and awareness).</p> <p>15) Develop briefing package or other training/orientation materials outlining tenant responsibilities or potential repercussions of their actions (competence, training and awareness)</p> <p>16) Incorporate specific environmentally-related language (i.e., roles and responsibilities) into agreements between the host organization and its tenants (competence, training and awareness)</p> <p>17) Develop written procedures and operational controls for tenant facilities (competence, training and awareness)</p> <p>18) Implement direct oversight (through formal inspections or reviews), or indirect oversight (require tenant conduct self-evaluations) (monitoring and measurement and competence, training and awareness).</p>

<i>Planning &amp; Preparedness</i>		
<b>Cause of Violation</b>		<b>Proposed Solutions</b>
<ol style="list-style-type: none"> <li>1. Extreme climactic conditions resulted in freezing within the clarifier and effluent tank and led to TSS violations.</li> <li>2. Infiltration in sanitary sewer and over-aeration in reactor basin also may have contributed to violations.</li> </ol>		<ol style="list-style-type: none"> <li>1) Develop new or modify existing operating procedures to account for expected weather fluctuations (<b>operational controls</b>).</li> <li>2) Ensure that employees are trained on implementing these procedures (<b>competence, training and awareness</b>).</li> </ol>
<ol style="list-style-type: none"> <li>3. CERCLA action discharges were not included in permit limits.</li> </ol>		<ol style="list-style-type: none"> <li>3) Communicate to management of the facility that changes to overall site conditions impact the operation of the WWTP (<b>management review</b>).</li> </ol>
<ol style="list-style-type: none"> <li>4. Damage to treatment plant due to storm surge from hurricane</li> </ol>		<ol style="list-style-type: none"> <li>4) Ensure that hurricane events are incorporated into environmental emergency preparedness (<b>emergency preparedness and response</b>).</li> <li>5) Ensure that procedures exist to account for changes to operations due to storm surges (<b>emergency preparedness and response</b>).</li> <li>6) Provide regular training to staff on storm surge procedures (<b>competence, training and awareness</b>).</li> </ol>
<ol style="list-style-type: none"> <li>5. Heavy rainfall generated hydraulic overload</li> </ol>		<ol style="list-style-type: none"> <li>7) Incorporate severe rainfall events into emergency preparedness exercises (<b>operational controls and emergency preparedness and response</b>).</li> <li>8) Provide regular training to staff on heavy rainfall procedures (<b>competence, training and awareness</b>).</li> </ol>



<p>6. Snow melt from parking lots resulted in run-off containing oil/grease</p>	<p>9) Add run-off from external parking lots into operational plans of the WWTP (<b>operational control</b>). Ensure that appropriate procedures exist and are adhered to during a rain event (<b>competence, training and awareness</b>).</p> <p>10) Work with external authorities responsible for the operation of the lots to adopt design or operating changes, where possible to minimize the potential impacts (<b>operational controls and competence, training and awareness</b>).</p>
<p>7. “Unanticipated” growth in onsite population created excessive loadings.</p> <p>8. Climactic factors, including cold and high winds, inhibited effectiveness of treatment.</p>	<p>11) Communicate to management of the facility that changes to overall site conditions potentially impact the operation of the WWTP (<b>monitoring and measurement and management review</b>).</p> <p>12) Ensure that severe climactic events are incorporated into environmental operating procedures (<b>operational control</b>).</p> <p>13) Ensure that procedures exist to account for changes to operations due to inclement weather (<b>competence, training and awareness</b>).</p>

<i>Infrastructure Conditions</i>	
Cause of Violation	Proposed Solutions

<p>1. Groundwater infiltration and inflow co-mingling with process waters</p>	<p>1) Ensure programmatic funding process is informed of plants condition and implications of plant failure to mission (management review).</p> <p>2) Ensure that contract specifications for upgrading the system are established so as to meet both existing and anticipated conditions, to the extent possible (management review and competence, training and awareness)</p>
<p>2. Failure and/or deficiencies associated with undersized and outdated equipment</p> <p>3. Reluctance to invest large amounts of resources in aging system due to anticipated privatization.</p>	<p>3) Ensure that contract specifications for upgrading the system are established so as to meet both existing and anticipated conditions, to the extent possible (competence, training and awareness).</p> <p>4) Ensure programmatic funding process is informed of plants condition and implications of plant failure to mission (management review).</p>