CHAPTER 7

OPERATION AND MAINTENANCE PROGRAM

INTRODUCTION

This Chapter summarizes the operation and maintenance programs maintained by the District to ensure performance and reliability of the wastewater collection system. The District maintains and services approximately 13.1 miles of force main, 155 miles of gravity sewer main, 22 lift stations, and a SCADA system. This Chapter includes a discussion of the responsibility and authority, normal system operation, routine preventative maintenance criteria, current staffing organization and needs, new construction, records, safety and emergency response procedures.

There are two primary objectives of this Chapter. The first objective is to provide documentation of satisfactory wastewater management operations in accordance with WAC 173-240. This objective includes a description of the staff organization, existing facilities and their normal operation, as well as safety procedures and an emergency response program. A more detailed Operations and Maintenance Program has been prepared in a separate document entitled “Water System & Wastewater System Operation and Maintenance Manual” dated March 2006 prepared by Gray & Osborne.

WASTEWATER SYSTEM ORGANIZATION

The District is governed by a three-member Board of Commissioners. Currently, the three Board members are Bill Anderson, Anne Backstrom and Rod Keppler. The District General Manager oversees the daily operations of the District. The General Manager is Patrick Curran.

The District Headquarters and Operations Facility are located at 15205 41st Avenue SE in Mill Creek.

The Board of Commissioners set the general policies for the operation of the District. As of December 2010, the District employs a field staff of 15 and an office and administrative staff of 13 including a licensed professional engineer. A complete organizational chart for the District is presented in Figure 7-1. This chart illustrates the specific personnel positions and corresponding responsibility for the District’s wastewater system.

The Operation and Maintenance staff is a collectively pooled work group consisting of staff charged with water and sewer maintenance duties. Routine wastewater utility work and assignments include, at a minimum, the following tasks:

- Side sewer maintenance replacement and repair
• Sewer gravity main maintenance, inspections and repair
• Wet well maintenance and repair
• Lift station maintenance and repair
• Gravity manhole inspection and repair
• Plan review and project punch list preparation

OPERATOR CERTIFICATION

There are currently no Washington State certification requirements for wastewater collection system operators. However, the Department of Ecology encourages participation for utilities that do not operate a wastewater treatment plant. Collection crew members are expected to have a mechanical aptitude, with experience with pipelines and pumps and their controls preferred. Both the District and the Department of Ecology encourage participation in a program of collection system certification. The District currently has 12 employees that have certification as a Collection System Maintenance Operator.

Table 7-1 summarizes the certification of staff personnel as of December 2010.

<table>
<thead>
<tr>
<th>Wastewater Operators</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walt Robison</td>
<td>1</td>
</tr>
<tr>
<td>Steve Tolpingrud</td>
<td>1</td>
</tr>
<tr>
<td>Lonnie Gibson</td>
<td>1</td>
</tr>
<tr>
<td>Jeff Enns</td>
<td>1</td>
</tr>
<tr>
<td>Andrew Fischer</td>
<td>1</td>
</tr>
<tr>
<td>Thomas Gaffhey</td>
<td>1</td>
</tr>
<tr>
<td>Richard Hoffer</td>
<td>1</td>
</tr>
<tr>
<td>Kyle Bosman</td>
<td>1</td>
</tr>
<tr>
<td>Bill Kuhlman</td>
<td>1</td>
</tr>
<tr>
<td>Greg Schwan</td>
<td>1</td>
</tr>
<tr>
<td>Brady Osborn</td>
<td>1</td>
</tr>
<tr>
<td>Andrew Piekarski</td>
<td>1</td>
</tr>
</tbody>
</table>

PROFESSIONAL GROWTH REQUIREMENTS

Operator training is an important component in maintaining a safe and reliable wastewater collection system. At a minimum, all personnel performing wastewater system related duties receive training in the following areas:

• Confined space
• Trenching and shoring
• Traffic flagging
• First Aid/CPR/blood borne pathogens
• OSHA safety training

In addition, two staff members have recently received CESCL (Certified Erosion and Sediment Control Lead) certification, which is valid for 3 years.

SYSTEM OPERATION AND CONTROL

The locations of the major system components are shown on Figure 5-3. A description of the normal operation of each facility is given in Chapter 5.

SCADA SYSTEM

The existing Supervisory Control and Data Acquisition (SCADA) system monitors the operation of various wastewater system components. The Master Control Panel (MCP), which is the logic center of the SCADA system, is located at the District Headquarters, at 15205 41st Avenue SE, Mill Creek, Washington, in Snohomish County. It consists of an operator interface, a programmable logic controller (PLC), and a communication network. The SCADA system provides an analog display of all the District’s lift stations.

Examples of the SCADA system’s ability to monitor flows and sound alarms follow:

Monitors

• Pump motor speed and amperage
• Wet well levels
• Monitor pump run times, and pump failures
• Generator status, along with run, starts, and fail counts
• Communications, RTU Panel and commercial power, fail counts and hours

Alarms

• High and low wet well level
• Wet well high float emergency
• Communication failure
• Pump fail
• Generator run or fail
• Intrusion alarm
• Commercial power fail
• RTU Panel power fail
The SCADA system has the capacity to add additional lift stations. Additional information can be found in the Silver Lake Water & Sewer District “Water System & Wastewater System Operation and Maintenance Manual prepared by Gray & Osborne dated March 2006.

ROUTINE AND PREVENTATIVE MAINTENANCE PROGRAM

Planning for present and future maintenance of the wastewater system facilities is as important as planning gravity sewer main extensions, lift stations, force mains, and other physical improvements. The maintenance effort must be continuous in order for the District to continue to fulfill its role as a wastewater collector in the future.

The role of maintenance is to preserve the value of the physical infrastructure and ensure that the District can continue to provide a safe and reliable wastewater collection system. The most cost-effective method for maintaining a wastewater collection system is to provide a planned preventative maintenance (PM) program. Through a planned PM program, the optimum level of maintenance activities can be provided for the least total maintenance cost.

The District’s PM program involves defining the tasks to be performed, scheduling the frequency of each task, and providing necessary staff to perform the task. For large and complex wastewater collection systems, the administration, scheduling, and record keeping generated by the PM program may be the greatest challenge.

SCADA SYSTEM

The SCADA system is monitored continuously to ensure that it is operating correctly. After hours if a SCADA alarm is activated, it contacts an “on-call” staff member for investigation and response.

LIFT STATIONS AND GENERATOR MAINTENANCE

The District visits and inspects each lift station on a weekly basis. Lift stations are cleaned once a month and their wet wells are pumped out biannually or as needed. Additional detail can be found in the Silver Lake Water & Sewer District “Water System & Wastewater System Operation and Maintenance Manual” prepared by Gray & Osborne dated March 2006.

All the lift stations are provided with a backup generator that will operate the station during a loss of commercial power.

FORCE MAINS

The District has a goal to exercise force main valves on an annual basis. The District’s force mains are designed to achieve scouring velocities that self-clean under normal
system operations and therefore require no maintenance. Air and vacuum relief assemblies may be located at the high points in the force mains. These assemblies are checked annually or as needed to ensure proper operation. Failure of the assembly may cause an air blockage in the force main, which can reduce or prevent flow through the force main and damage lift station pumps.

MANHOLES AND GRAVITY SEWER LINES

The District’s manholes are inspected and gravity lines jetted once every 3 years. In some cases segments of pipe have been identified to receive more frequent inspection and jetting.

EMERGENCY RESPONSE PROGRAM

Wastewater utilities have the responsibility to provide collection of wastewater in a reliable manner at all times. Therefore, utilities must reduce or eliminate the effects of natural disasters, accidents, and intentional acts.

EMERGENCY PROCEDURES

Though it is not possible to anticipate all potential disasters affecting the District’s wastewater system, formulating procedures to manage and remedy several common emergencies is appropriate. The District has completed a Vulnerability Assessment and Emergency Response Plan (VA/ERP) and updates it as appropriate. An update will be completed in 2011.

Power Failure

Various types of weather can cause loss of power, such as wind, lightning, freezing rain, and snowstorms. Power may also be lost through traffic accidents. The District has an on-site generator at the District headquarters to maintain business functions and to maintain operation of the SCADA system master telemetry unit. The District has auxiliary power at 21 of its 22 lift stations to allow operation in the event of a power failure (Glacier Peak High School concessions lift station does not have auxiliary power). Should power be interrupted, Snohomish County PUD will be contacted to determine the estimated length of the power outage. If an extended power outage is anticipated, District crews report to check sites for problems and monitor fuel levels.

Severe Earthquake

A severe earthquake may not only have a substantial impact on the District’s wastewater system but also the adjacent purveyors, including the City of Everett and King County collection and wastewater treatment facilities. Table 7-2 presents potential effects of a severe earthquake on the wastewater system components.
TABLE 7-2

Emergency Response Procedures for an Earthquake

<table>
<thead>
<tr>
<th>Wastewater System Component</th>
<th>Potential Effects</th>
<th>Recommended Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lift Stations</td>
<td>Station surcharge and backup into residential side sewers</td>
<td>Check telemetry and dispatch pump trucks and portable generator trucks as necessary.</td>
</tr>
<tr>
<td>Force Mains</td>
<td>Broken force main</td>
<td>Dispatch pump truck and repair crew</td>
</tr>
<tr>
<td>Gravity Sewer and Manholes</td>
<td>Broken sewer pipe or manhole</td>
<td>Dispatch pump truck and repair crew</td>
</tr>
</tbody>
</table>

SAFETY PROCEDURES

Work place hazards for this system are primarily limited to confined space entry, electrical equipment, health hazards associated with sewage, and traffic hazards associated with doing work in the right of way. Staff is trained as to proper entry into confined spaces such as below grade equipment vaults and wet wells. Staff uses WISHA, traffic control, and first aid training to ensure job safety.

CUSTOMER RESPONSE

The District maintains a log of public communications with respect to the wastewater system. Depending on the nature of the issue, a staff member may be contacted to confirm if a public health issue is apparent. If the issue does not require immediate attention, a work order will be completed and staff will respond as soon as feasible.