

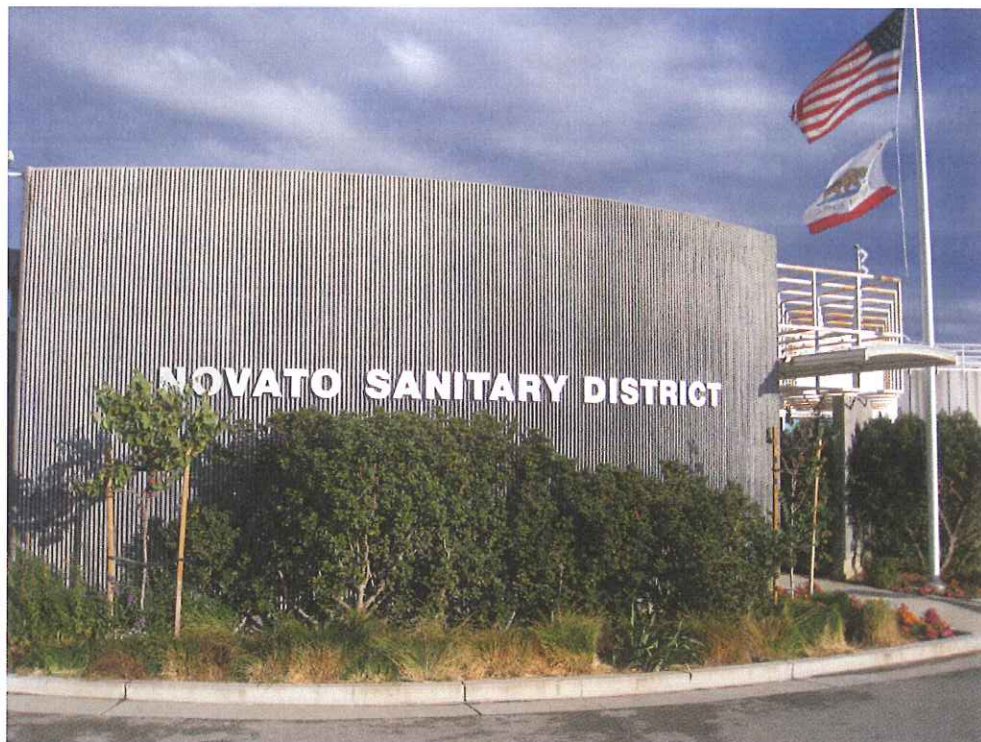


# **NOVATO SANITARY DISTRICT**

## **SELF-MONITORING PROGRAM**

### **2012 ANNUAL REPORT**

#### **APPENDIX B**



#### **RELIABILITY STATUS REPORT**

**APPENDIX B**  
**NOVATO SANITARY DISTRICT**  
**Reliability Status Report for Operation of the**  
**Treatment, Reclamation, Disposal, and Collection Facilities**  
**January 2013**

**Facility Reliability and Performance (Overview)**

**Wastewater Treatment**

In September 2006 the Novato Sanitary District committed almost \$100 million dollars toward the upgrade and improvement of their wastewater treatment facilities. Key objectives included:

- Reliable conveyance, treatment, and disposal, of all sewage generated in the service area.
- The elimination of blending during high flow / inflow and infiltration events
- Full secondary treatment of all wastewater discharged
- Consistent compliance with regulatory standards
- Time tested technology

**Reliability by Design**

**Redundancy** - The new facilities were designed with an emphasis on reliability. Critical processes are designed with redundancy. In many cases this includes one standby unit available when operating at maximum capacity. For purpose of illustration – the designed Maximum Peak 3-Hour Capacity of the facility is 47 mgd. The influent pump station is designed to convey 47 mgd with five of the six influent pumps in service, leaving one pump as a backup. Where practical this design concept is carried throughout the facility.

**Energy Systems** – All motor control centers (MCC) and electrical systems have back-up power supplies. A combination of generators and/or uninterruptable power supplies ensure seamless operation in a power outage.

**Automation and Remote Monitoring** – The Novato and Ignacio facilities are equipped with state of the art controls. A modern supervisory control and data acquisition (SCADA) system is the backbone of the operator interface, monitoring, and alarming capability. The SCADA system provides remote monitoring of facilities, equipment, and processes. Alarms will alert the operator in the event an out of parameter condition. After hours the operator can monitor processes using a laptop computer via a secure virtual private network (VPN). This provides the ability to respond to alarms within minutes. The VPN can be accessed either by a hard wired internet connection, mobile broad band connection (ATT brand name *Air Card*), WiFi, or any high speed internet connection.

### **Operations and Maintenance**

**Veolia** – In October 2009 the Novato Sanitary District (District or NSD) entered into a service agreement with Veolia Water West Operating Services (Veolia).

Veolia is responsible for the operation and maintenance of:

- The Novato Wastewater Treatment Facility
- Decant pumping (return) station located at the reclamation area
- The Ignacio Transfer Pump Station.

**Staffing** – The wastewater treatment plant is staffed 8 hours per day, seven days per week. Typical weekday staffing includes a Chief Plant Operator, Operations Manager / Supervisor, Administrative Assistant, Wastewater Treatment Plant Operators (3-4), and Maintenance Mechanics (1-2). Off shifts are covered by an on call operator and SCADA system remote access via VPN (as described above). Weekend and holiday coverage is provided by a qualified wastewater treatment plant operator.

**Operations and Maintenance Manual** – An electronic operations and maintenance (eO&M) manual was developed by HDR Engineering as part of the

recent treatment facility upgrade. The eO&M provides facility descriptions, operating scenarios, troubleshooting information, and much more. The manual also provides links to equipment operations and maintenance manuals, design information, diagrams, schematics, and other relevant information. The eO&M manual is a living document that is updated as necessary.

**Standard Operating Procedures (SOP)** – The eO&M manual is supplemented by SOP. The SOP provides specific task instructions. The general SOP layout is as follows:

- description of the work to be performed
- safety considerations
- personal protective equipment required
- lockout tagout or other special requirements
- step by step instructions on completing the work

**Hach WIMS (Water Information Management System)** – Hach WIMS is an off-the-shelf non-proprietary software system used to store and access data. Operational and laboratory information is entered into the data base. WIMS provides preformatted reports as well as wizards that allow the user to build customized reports. Hach WIMS is the repository for historical lab and process data as well as the primary tool used for electronic reporting.

**Process Control Management Plan** – The Process Control Management Plan (PCMP) is a tool used at all Veolia operated facilities. The PCMP is a dynamic tool used to stay ahead of process changes. A formal weekly meeting is chaired by the Operations Manager or his/her designee. Process parameters such as mixed liquor suspended solids (MLSS) and sludge volume index (SVI) two name two are compared to established targets. If the actual values deviate beyond acceptable parameters action is taken. The meeting has an agenda, minutes are kept, goals established and reviewed. An annual review of the PCMP process is

performed by Veolia staff not connected to the Novato project. Feedback and/or action items are provided to the Project Manager.

**Asset Management** – Key components of an Asset Management Program include:

- Computerized Maintenance Management System
- Preventive, Predictive, and Corrective Maintenance
- Equipment Inventory
- Reliability / Criticality Assessment (Hierarchy of Equipment Priority)
- Condition Assessment
- Replacement Program
- Capital Improvements Program

### **Computerized Maintenance Management System**

Veolia uses *Job Cal Plus*™ (Job Plus) as the basis for scheduling and tracking maintenance and repairs at Novato. Job Plus is an off-the-shelf, non proprietary software program available from Hach. Job Plus uses the Micro Soft Access data base platform to store and access information.

### **Preventive, Predictive, and Corrective Maintenance**

Preventive maintenance (PM) is a scheduled maintenance activity generally tied to equipment run time (500 hours) or period schedule (weekly / quarterly).

Routines such as lubrication, oil change, filter change fall into the category of PM. Predictive maintenance (PdM) is performed to determine when maintenance might be required and or condition. Tasks such as vibration, temperature, and oil analysis are types of PdM. Corrective maintenance is maintenance initiated when a deficiency is found.

### **Equipment Inventory**

An accurate equipment inventory is crucial to all phases of Asset Management. Equipment must be accounted for to be maintained or for replacement to be planned. Equipment at the Novato facility inventoried and loaded into Job Plus

### **Reliability / Criticality Assessment (Hierarchy of Equipment Priority)**

A Criticality Assessment was performed at the Novato facility in August 2010. The assessment evaluates processes and equipment rates the relative importance. The evaluation process looks at consequences and likelihood of failure and redundancy. The product helps the user prioritize replacement and maintenance.

### **Condition Assessment**

Equipment condition is an important factor in planning repair and replacement. A condition assessment was performed in August 2011. Condition assessment looks at general condition such as rust and corrosion and a number of indicators such as vibration, temperature, and noise.

### **Replacement Program**

A replacement program is a planning tool that provides an opportunity to set aside funding for aging equipment. Although the Novato facility is new equipment begins to age the day it is placed into service. Even with the best maintenance and care it will eventually need to be replaced. Prudent asset management suggests that funds be set aside as equipment ages. Veolia's Asset Management group is developing a Replacement Plan for Novato and the Ignacio Transfer Pumps station. The plan should be complete by June 2013.

### **Recommended Capital Improvements**

Several potential capital improvements and projects have been identified for consideration. The Capital Improvements Plan will be included with the Replacement Plan.

## **Collection System & Pumping Facilities**

The District owns and maintains a sewer collection system consisting of approximately 225 miles of sewer mains. These facilities serve an area covering 24.7 square miles encompassing the Bel Marin Keys, Ignacio, Rancho Novato, San Marin and Bahia areas.

The collection system is maintained by a department of 8 employees operating three cleaning vehicles and one video inspection van. In 2012, collection system crews cleaned an average of about 66,000 feet of sewer lines a month. Cleaning is scheduled using a computerized maintenance management system (CMMS) system and the schedules are customized based on sewer system need and industry practices.

The District typically budgets an average of about \$2 million annually on collection system improvements. Projects sizes range from minor spot repairs to complete neighborhood sewer system upgrades. Project priorities are based on capacity issues, overflow history or damage severity index (DSI) of a sewer system generated by a computerized video inspection program.

As part of the collection system, the District operates 39 pump stations; 38 maintained by the Collections Department and one operated and maintained by Veolia, the District's Treatment Plant operator. Of the 38 pump stations operated and maintained by the Collections Department, five of these pump stations are regional pump stations, Olive Street Pump Station, Marin Village Pump Station, Bahia Pump Station, East Hamilton Pump Station & Bel Marin Keys No. 5 Pump Station. Each of these pump stations is fitted with at least three pumps, lead, lag & standby. In addition, each of these pump stations have emergency standby electrical generators in case of power failure.

The remaining 33 pump stations are smaller capacity duplex pump stations. Each pump station is fitted with a minimum of two pumps; one duty and one standby. In addition, each duplex pump station has an external connection for a portable generator, except for two of them which have permanent mount standby emergency generators on site. Also, these smaller pump stations are fitted with connections for bypassing the pump station with a portable pump.

Each pump station is monitored remotely by a SCADA system. At most stations, wet well level & pumps running conditions can be monitored in real time from a computer at the main office or remotely via laptop by an on call employee. Maintenance is scheduled using a CMMS system insuring pump stations and related systems are maintained on a regular schedule.

The District has one full time Collection Department employee maintaining the pump stations during the normal work week. In addition, the on call employee visits four of the regional pump stations on weekends and holidays. The on call employee is also fitted with a pager so the SCADA system can advise the on call employee if any alarm conditions are generated at the pump stations 24 hours a day, 7 days a week.

The District has been carrying out a major pump station rehabilitation project where it has replaced the majority of its underground pump stations with submersible type pump stations. The District has been budgeting between \$1.5 and \$3 million annually on pump station improvements for the last few years, to carry out these rehabilitation efforts. For FY 12 - 13 the District has budgeted about \$2.1 million for pump station repairs and rehabilitation. Projects sizes range from minor pump replacement to major pump station rehabilitation upgrades. Currently, project priorities are based on maintainability requirements, capacity issues and reliability.