

## EMS for Biosolids Training Document for OE's and TPO's

The Critical Control Point (CCP) Table is to be used as the main EMS training guide for all operations positions. It must be reviewed by operations staff each year to ensure knowledge and compliance of stated responsibilities.

Hold meetings, in small groups or individually, to discuss how individual and team performance affects the production of biosolids.

The following areas of discussion were compiled by operations staff at various plants. ALL STAFF IS ENCOURAGED TO PROVIDE COMMENTS TO THEIR SUPERVISOR FOR ADDITIONS TO THE FOLLOWING.

### **Mechanical Operations:**

- Importance of the preliminary treatment and the removal of inorganic material, such as the removal of debris from the fine screens, coarse screens and grit removal.
- Importance of SOP's, NPDES permit violations, poor quality effluent/ biosolids and odor complaints.
- Importance of daily reports, operating logs, equipment failure and the impact they have on the treatment process.
- Importance of our spill prevention plan and how our plan has been put into place on several occasions. During the times we've had to utilize our spill prevention plan, we were able to maintain our permit with no violations.
- Importance of solid transport, monitoring pump pressure, and our SOP back up emergency procedure in the event of a sludge line rupture.

### **Treatment:**

- Sewer maintenance, Influent and odor control.
- Sewer maintenance ensures that the sewers are cleaned when necessary, to prevent a build up of septic sewage that promotes filamentous bacterial growth and subsequent quality of the biosolids.
- Influent monitoring prevents or reduces illegal dumping that could negatively impact the aeration process. Influent is also controlled based on adequate pumping rates that prevent hydraulic overload of the aeration system resulting in poor quality effluent and biosolids.
- Odor control is a critical part of operations. Addition of Sodium Hypochlorite should be controlled to prevent excessive oxidation of the incoming food and subsequent upset of the aeration process due to low food to mass (F/M).

### **NPDES PERMIT:**

- Includes DO as one of the parameters. DO is a key control point in measuring the efficiency/performance of the aeration process. Low DO could mean insufficient ammonia/BOD reduction and incomplete stabilization of the sludge, resulting in poor quality biosolids.

### **MLSS, SRT, RAS RATE WAS RATE AND FEED RATE:**

- All of these are controlled because they impact the performance of the aeration system.
- MLSS should be maintained at a level that allows enough microorganisms for ammonia/BOD reduction but not too excessive to create unnecessary air demand.

- RAS feed rate provides an adequate MLSS within the aeration system.
- Raw sewage feed rate should be such that the minimum sludge retention time (SRT) for efficient aeration system is promoted.
- WAS rate is controlled to prevent excessive solids inventory that will create low F/M ratio, a favorable condition for filamentous organisms and subsequent degradation of the biosolids quality.
- Influent feed rate control at the head works prevents hydraulic overload of the grit system with a resulting washout of grit into the aeration system.
- Large grit deposits in the aeration tanks and return sludge channels promote filamentous growth due to low DO conditions.

#### **Kirie to Egan Sludge Force Main:**

- Sludge line monitoring is necessary to prevent excessive sludge spills, which is a public nuisance. By monitoring the pressure of the line and sludge flow, leaks could be detected on time and reduce such incidence.

Awareness training can be conducted each year as a group, after a Safety Committee meeting. It is suggested to all those present to further extend EMS awareness to all coworkers in their work Units.

#### **Operating Engineer, OE**

- Thickening wasted mixed liquor and primary sludge with the use of centrifuges or belt thickeners prior to introduction to the anaerobic digester program. (Except for primary thickening which the TPO controls.)
- Monitor blanket level, sludge consistency and adjust pump rate to the digester based conditions.
- Adjust the polymer dosing to maintain the thickest cake (over 6% solids) that can be pumped to the digesters without interfering with primary sludge pumping operations.

#### **Treatment Plant Operator, TPO**

- Analysis of laboratory data, i.e. volatile solids percentages before and after a digester, carbon dioxide and methane production outputs, pH, and acid to alkalinity ratios.
- Monitor all the processes in the plant, digester temperature, collecting the samples for lab analysis, notify the OE if they receive process related alarm.
- Egan's waste activated sludge wasting is controlled by SRT to maintain adequate amounts for mass for the process.
- Sample the GBT cake and receive ACOE directions on how to operate the GBT's.
- Use the primary tanks to gravity concentrate the primary sludge to maintain 3% solids in the feed.
- Adjust the primary sludge pumping strategy by changing the timers for each tank to draw from the tanks with the greatest blanket depth.
- Reduce odors from the primary sludge the TPO's pump rate changes to keep the blanket below 1'.
- Controlling the quantity of sludge generated (reducing the water pumped to digesters) for pathogen reduction.
- Centrifuge operations maintain or increase space in the digesters as feed rates minimize space.