BEDFORD REGIONAL WATER AUTHORITY

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DOWN THE PIPELINE

INSIDE THIS ISSUE:

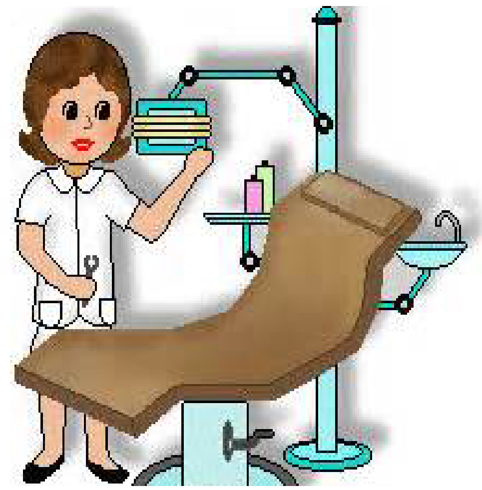
DENTAL AMALGAM EFFLUENT GUIDELINES

Following up on last quarter's lead story, I wish to pass along more information concerning the approaching implementation of EPA's proposed amalgam guidelines.

Any dentist that does not fully and completely comply with the Industrial User rules contained within these guidelines would automatically become a Significant Industrial User triggering enforcement and permitting requirements identical to major industries and factories. This would mean facility inspections, records audits, and frequent sampling of the dental office discharge to the collection system.

These rules would require each dentist to operate and maintain the separators following all manufacturer's instructions and conduct inspections at least monthly to ensure all features are functional. Each dentist will have to submit reports to that effect. There will be reporting requirements and Best Management Practices requirements as well.

All Town of Bedford dentists who already have amalgam separators installed in their offices need to make sure that they are following the manufacturer's instructions on how to operate and maintain them. Those dentists who do not have any amalgam separator/s should begin looking into what it will cost to purchase and install them.



What is missing from this dental office? An amalgam separator!

Unless EPA becomes convinced to make major changes to this proposed regulation, it will most likely become effective by the end of 2015.

The public comment period for this proposal ended on February 21, 2015

BIOSOLIDS LAND APPLICATION UPDATE

There is ongoing confusion among the general public over municipal biosolids and industrial sludge. Industrial sludge is those solids created within an industry's production process/es that are then dewatered before disposal.

They generally are not exposed to the digestion process for reduction of material, nor are they normally containing waste activated sludge solids. Both materials are land applied in Virginia under similar programs. There currently are legislative bills up for passage that would require industrial sludge to be handled the same as biosolids, with a $5 per dry ton fee for any that is land applied.

Industrial Waste Compliance Programs

Although the vast majority of industrial companies will strive to comply with reasonable effluent limitations, a small minority of companies may try to avoid compliance, for a variety of economic reasons.

A well designed industrial waste pretreatment program ensures that the vast majority of companies will be protected from the unfair competitive advantages obtained by companies that are not ethically motivated to comply.

Bedford's local pretreatment personnel have a legal and ethical duty to properly implement a pretreatment program. EPA regulations allow penalties to be assessed against POTWs when they do not rigorously implement compliance actions against noncompliant companies. Failure by the POTW to properly execute its compliance program can also result in the state or the federal government taking over the local pretreatment program.

Thus, an Enforcement Response Plan must be created, implemented, reviewed, and revised on a continuous basis.

Annual publication in a local newspaper of significantly noncompliant companies is required by Section 403.8(f)(2)(vii) of the General Pretreatment Regulations. This listing provides public education as well as providing a deterrent to continued noncompliance.

Since sampling/analysis is such a large aspect of a company's compliance program, it is always beneficial to use a laboratory that does not charge outrageous fees for their services. However, ethically one can't expect pretreatment personnel to recommend specific laboratories for use. This extends to engineering consultant agencies, general contractors, etc. No special favors can be given to any company.

Industrial wastewater discharge permits are required by EPA of all POTWs with approved pretreatment programs. These permits provide the information needed to determine which industries will require a permit to discharge into the collection system of the POTW. This information aids in determining if a pretreatment system must be developed and installed to prevent damage to the POTW or its personnel.

This permitting system creates accountability for each permitted industry. It also establishes what is permissible to discharge into the collection system and at what concentrations.

In any program there is always the requirement for record keeping. In the industrial waste compliance program the requirement is to keep on file all discharge documents for at least three years. It is now recommended to keep both a paper filing system as well as an electronic filing system.

It should be remembered that the industrial wastewater discharge permit is a legally binding agreement between the POTW agency and the permittee. The POTW agency agrees to provide wastewater collection, treatment and disposal for the company's wastewater if the company will comply with certain conditions. These conditions must be specified in the permit document that is signed by both parties.

A significant part of a compliance program is preventing and minimizing wastes at the source. Whenever feasible pollution should be prevented or reduced at the source. Pollution that can't be prevented should be recycled in an environmentally safe manner whenever feasible. Pollution prevention generally involves the following areas: process modification, material substitution and product reformulation; improved process operation and maintenance; good operating practices (good housekeeping); and material recycle, reuse and recovery for in-process use. These also are known as Best Management Practices, and now can be found as part of discharge permits.

Material substitutions are generally industry-specific. An example of this would be replacing solvent-based cleaners with water-based cleaners, thus eliminating the use of toxic organic substances as cleaners.

An example of product reformulation is the removal of lead from paint products and the removal of cadmium from ink formulations. Both of these choices removed toxic metals from being introduced into wastewater streams.

In the printing industry one can recycle inks to make black ink, rather than sending it to the sewer. Or install rinse water recycling. Or minimize spills, provide effective spill containment, and keep lids on containers of solutions. The running o similar jobs can help eliminate cleaning between jobs.

For any industry that must install and operate pretreatment equipment, operational monitoring within the process train is of immense value in preventing violations in the effluent leaving the equipment. It is a simple matter of either being reactive or proactive in pretreating a wastestream.

WATER QUALITY STANDARDS ATTAINMENT AND MONITORING

Here are some highlights from the EPA February 4, 2015 draft document that potentially may impact Bedford County.

Cross-Sector "Consequences" - This would make one sector such as the wastewater sector bear "consequences" if another source sector fails to meet its goals or simply needs more time to do so than currently expected. This means that if the agricultural sector failed to meet its goals then the wastewater sector could be made to make up the difference in pollutant removal. This approach is problematic since agriculture is a nonpoint source of pollution whereas wastewater is a point source.

Toxic Contaminants Policy and Prevention Outcome—EPA's Toxics Workgroup chose to focus on PCBs. They suggested that WWTP modifications may be necessary to reduce PCBs. This would be a high cost approach that would not eliminate any sources of contamination. It would seem that source control at contaminated sites and streams would be more desirable and effective. To focus upon conveyance systems versus sources does not work either. Centering their draft upon stormwater and wastewater deals with the conveyance of pollutants from sources. This draft ought to be organized to focus directly on those sources (contaminated soil, air deposition, contaminated sediments, PCB transformers still in use, etc.). Various groups have suggested that EPA needs to take a "holistic" view. Is this the proper time to focus upon PCBs? Why not upon nutrient removal or aging infrastructure rehabilitation? References to Method 1668 should not be made in regards to sample and analysis for PCBs. EPA ought not to heavily rely upon this method since it does not meet EPA's own requirements under 40 CFR Part 136 and comparable State requirements. To rely upon this method creates, potentially, a significant flaw to any overall strategy.

It would appear that EPA ought to move towards resolving sources of PCB pollution rather than attempt at removal through WWTPs. We will have to wait and see what direction EPA ultimately chooses to go.

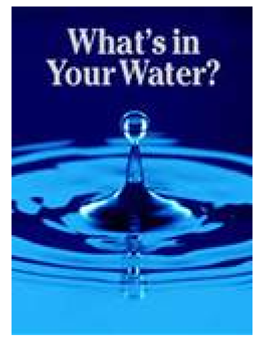
In freshwater nutrient criteria updates, Virginia DEQ received a response from EPA Region III last fall. At this time DEQ intends to proceed further with development of their screening criteria, and eventually reach a regulatory proposal. DEQ has reported that its Work Plan for 2015 focuses on other priorities and thus further work on nutrient criteria will be another year down the road.

In Maryland, there has been no change in their position regarding the development of statewide numeric freshwater nutrient criteria. Existing research results on the Potomac River Basin did not result in defensible numeric criteria. The state response to EPA's comments that Maryland needs to adopt these criteria was that there are no study results that provide clear evidence for how to develop numeric nutrient criteria for all of the state's wadeable streams.

The Virginia Association of Municipal Wastewater Agencies (VAMWA), has been working to evaluate what the cost would amount to when DEQ implements its new ammonia criteria. Procedurally, DEQ presented proposed amendments to the Water Quality Standards Regulation to the State Water Control Board last March. The SWCB then approved the proposal for public notice and hearing. Review by the Secretary of Natural Resources is now complete and the proposal currently remains under internal review in the Governor's office. DEQ originally projected a final rule in late 2015 at the earliest. It would seem that this date becomes less likely with continued executive review of the proposal.

The projected costs statewide would be $384 million, with additional costs to be determined in industrial permittees, pretreatment, and total maximum daily loadings.

VAMWA assumed (as did VA Department of Planning and Budget) that 1/3 of WWTPs currently with nitrogen limits will need to upgrade in order to meet the new ammonia criteria-based limits. Implementation will have to deal with the temperature and pH of the water, possibly ammonia-specific antidegradation of receiving waters, long compliance schedules, and perhaps even variances. The Bedford WWTP currently has an ammonia limit in its permit and removes excess ammonia through a nitrification process. Bedford WWTP also has an approved industrial pretreatment program which has approved local limit on ammonia discharged by industries. If DEQ's proposal becomes final, then there most likely will be repercussions within the pretreatment program's local limits for ammonia. This is something that all permitted industrial users in Bedford ought to closely monitor this year and next year as well.



"DEQ has reported that its Work Plan for 2015 focuses on other priorities and thus further work on nutrient criteria will be another year down the road."

WHAT IS WASTEWATER TREATMENT? PART TWO

Having all of these tanks that involve allowing solids to settle out to the bottom, operators of the treatment plant must remove those solids periodically and store them elsewhere.

How these "solids" are handled is termed "residual solids management." The solids settling in the primary sedimentation tanks are moved into a set of smaller tanks called gravity thickeners. Quiet conditions allow solids to settle and thicken at the bottom of these tanks.

This sludge thickening process seeks to reduce the sludge volume to be handled by subsequent processes. At the Bedford Central WWTP thickening is via gravity followed by stabilization via digestion. A conditioning process utilizes chemicals to prepare the digested solids for dewatering via a belt filter press. This entire process reduces the volume of solids and the percentage of water which will be sent out to either be land-filled or composted.

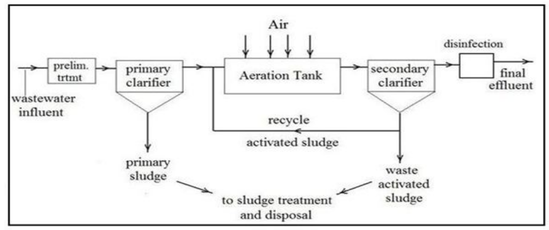
The thickened solids are pumped to a digester to be mixed with excess activated sludge using dissolved air. The microorganisms found in the activated sludge continue to consume the primary solids while being supplied with oxygen. Instead of methane being produced, carbon dioxide and water are produced in aerobic digestion. These solids are kept in the digester for a long enough period of time that the organisms begin to devour one another, reducing the volume of solids in the digester.

The conditioning phase uses synthetic polymers to cause the solids to floc together in larger clumps so that the water may be removed. These polymers are injected into a pipe leading into the belt filter press. This allows for sufficient mixing of polymer and solids before reaching the drainage belt.

Belt filter presses consist of two endless belts that travel continuously over a series of rollers. Belt tension and speed can be controlled to force more or less water from the solids between the two belts. The "dried" cake is dispensed from the ends of the belts and scraped off onto a conveyor belt that deposits it into a roll-away container.

If this filter press cannot be used, then Bedford resorts to using its sand drying beds. These beds are filled with different layers of material with fine sand on the surface. Digested solids are pumped from the digester onto the surface of the drying beds to a depth of about 6-9". Multiple drying beds can be used over time. The solids are then allowed to remain on the drying bed until most of the water has either drained away through the sand or has evaporated. The water that drains away through the sand is collected by an under drain system and is redirected back to the treatment plant. The length of time for drying the solids this way depends upon temperature and weather. Once the solids have dried enough the operators remove it to a roll away container manually. Obviously, the operators prefer to dewater solids using the belt filter press rather than the sand drying beds.

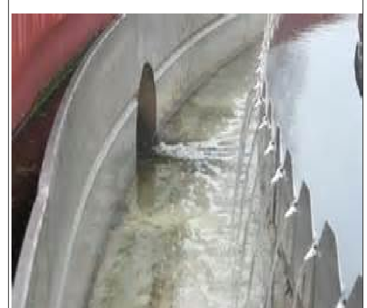
One residual solid that does not directly go through the digestion unit is that which can be found in the effluent of the secondary clarifiers. These fine solids are pumped to a series of vertical sand filters designed to remove the solids. Different types of media can fill these filters but in all cases they are meant to attract and retain solids. At the Bedford plant, these units get backwashed when they become too "dirty." Just like with a sand filter for a swimming pool, flow is redirected through the filter to dislodge accumulated solids and remove it from the filter. This dirty backwash water is then pumped from a collection tank back to the beginning of the plant to be reprocessed. If necessary, a polymer can be administered to the clarifier effluent before it enters the sand filters to increase the removal rate of solids.



Activated Sludge Wastewater Treatment Flow Diagram

Upon leaving the sand filters, the plant effluent flows through two contact tanks, that together with the sand filters, provide sufficient detention time for disinfection to occur with the addition of chlorine. Water leaving the contact tanks is then mixed with sulfur dioxide to remove excess chlorine before the water flows out of the plant.

As discharge limits have become more stringent the reuse of treatment plant effluent has become more attractive. Currently, Bedford reuses its effluent in the sprayer system of its belt filter press. It also sells reuse water to contractors for dust control on construction projects. A reuse water line has been installed to Trident SeaFoods' property for them to use in their cooling towers. Reuse water decreases the usage of potable water, so there is more potable water for everyone else to use. And that, is what wastewater treatment is all about.



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Maintenance Manager——Bert Smith, Extension 122

"AS LONG AS IT FLOWS, WE WILL TREAT IT."

Industrial Pretreatment Facility Inspections

What exactly comprises an "industrial facility inspection"? A complete inspection would involve a tour of the entire facility and include all four of the following areas: the outfall, effluent treatment equipment, in-plant wastewater control equipment, and a general tour of the building.

The outfall is always visited. Sampling can be done if needed. An industry may have multiple discharges to the sanitary sewer and all must be inspected. Confined spaces are not entered into. Final effluent meter charts/ readouts need to be checked for any instances of noncompliance regarding pH, flow, temperature, even conductivity or oxidation-reduction potential (ORP). pH meter calibration log sheets can be checked for accuracy.

Effluent treatment equipment needs to be checked for functionality. A basic piece is the clarifier for the separation of suspended solids. There could also be oil removal units, roto-screens, bar screens, dissolved air flotation units, dewatering units, ion exchange units, flow equalization units, and pH adjustment units.

In-plant control equipment includes such things as spill containment. Dikes and berms may be permanently installed. Portable spill containers offer flexibility in placement. Structural integrity of containment must be checked, as well as bonding between berms and floors. Incompatible materials are not to be stored together. Spills that are delivered to the pretreatment system must be documented in a logbook. Floor drains near the storage of chemicals must be either plugged or filled.

Rainwater must be prevented from entering into the sanitary sewer and from entering into material storage areas.

Production operations and equipment need to be checked. Waste storage needs to be checked. Any air pollution control equipment must be checked. All manufacturing areas must be checked. Raw material storage needs to be checked.

Pretreatment equipment must be inspected for condition and operability. This includes pumps, meters, piping, valves, injectors, and tubing., as well as mixers.

If waste oil is being stored on-site, then where is it being stored and with what spill containment? Is it near any storm drains? Is there evidence of spillage entering the storm drain? The same goes for spent cooking oil.

At the end of each inspection there will be a time for a discussion of any deficiencies, complaints, or violations. No inspection is complete until a final written inspection report is received by the industry that has been inspected!