



E.S.BABCOCK&Sons,Inc.

Environmental Laboratories *est. 1906*

Storm Water Contamination – A Slick Problem

Although not particularly toxic in and of itself, Oil and Grease (O&G) is a key indicator of pollution in storm water runoff. In the environment, Oil and Grease has many deleterious effects. In sewage, it hinders the proper operation of the water treatment facility. In storm drains, it makes an efficient “cover”, preventing aeration and providing a food source for bacteria --leading to anaerobic conditions.

There are two basic subcategories of Oil and Grease: polar and non-polar. Determining the relative amount of each will provide important information about the nature of the contamination. Polar O&G consists of the organic material derived from animal and plant lipids – composed mostly of fatty acids and glycerol esters. Non-polar O&G is usually comprised of total petroleum hydrocarbons (TPH), such as diesel fuel, motor oil, lubricating oils, hydraulic oils, etc. As you can see, identifying the Oil and Grease type aids in identifying the possible source. For example, if storm water running off the property of a large restaurant is considerably higher in non-polar than in polar O&G, it's a good bet that the source is the parking lot rather than the outdoor grease trap from the kitchen.

Because oils and greases have a propensity to “stick” to any material with which they come into contact, a separate container must be used to collect the O&G subsample. A grab sample should be taken. The use of autosamplers with traditional Tygon® and silicone rubber tubing should be avoided. Also note that the O&G will not be entrained throughout the entire water column, but will, instead, be mainly floating on the surface. Therefore, a careful protocol must be in place in order to collect a “representative” sample (i.e. don't just skim off the water's surface nor submerge the container far under the surface.) The laboratory will use the entire contents of the container and will include a step that uses a solvent to rinse the inside of the jar and the underside of the lid. Each sample is individually analyzed and carefully monitored to optimize extraction efficiency, control emulsifications and prevent losses.

Most storm water permits provide an option to determine either the O&G or the total organic carbon (TOC) content of the sample. They are not the same thing. TOC is comprised of O&G and a whole lot more. Plant and insect detritus along with humic acids, tannins and lignins, and other carbonaceous material can be prevalent in many run-off waters. TOC results provide more information relating to any possible detrimental effects the runoff may have on the health of the receiving waters.

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What the TOC result will not effectively convey is the level of trace organic pollution, such as the presence of priority pollutants. If your permit requires that monitoring for “toxics” is necessary because your facility uses one or more of these chemicals, a TOC determination will not suffice as a screening tool. In such cases, EPA Methods 624 and 625 are required.

Please discuss any analytical issues pertaining to your storm water monitoring program with one of our project managers. They will be happy to make suggestions that will best fit your needs.

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