

Visual Inspection of Outfalls

Physical Conditions

Observed Conditions	Possible Problems	Possible Causes
Color		
Muddy, Cloudy	Indicates elevated levels of suspended solids giving the water a muddy or cloudy appearance	Erosion is the most common source. Land use associated with soil erosion include mining, farming, construction, and unpaved roads
Dark Reds, Purple, Blues, Blacks	May indicate organic dye pollution	Originating from clothing manufacture or textile mills
Orange-Red	May indicate the presence of copper or iron	Copper can be both a pollutant and naturally occurring
Blue	May indicate the presence of copper which can cause skin irritations and death of fish	Copper is sometimes used as a pesticide in which case an acrid (sharp) odor might also be present
Foam	May indicate the presence of soap or detergent	<u>Excessive</u> foam is usually the result of soap and detergent pollution. Moderate levels of foam can also result from decaying algae, which indicates nutrient pollution.
Multi-colored (oily sheen)	Indicates the presence of oil or gasoline floating on the surface of the water. Oil and gasoline can cause poisoning, internal burning of the gastrointestinal tract and stomach ulcers	Oil and gasoline pollution can be caused by leaks in fuel lines and underground tanks, automotive junk yards, nearby service stations, wastes from boats, or runoff from roads and parking lots.
No Unusual Color	Not necessarily an indicator of clean water	Many pesticides, herbicides, chemicals, and other pollutants are colorless or produce no visible signs of contamination
Odors		
Sulfur (rotten eggs)	May indicate the presence of organic pollution	Possible domestic or industrial waste.
Musty	May indicate presence of organic pollution	Possible sewage discharge, livestock waste, decaying algae, or decomposition of other organic pollution
Harsh	May indicate presence of chemicals	Possible industrial or pesticide pollution
Chlorine	May indicate the presence of over chlorinated effluent	Sewage treatment plant or a chemical industry
No unusual smell	Not necessarily an indicator of clean water	Many pesticides and herbicides from agriculture and forestry runoff are colorless and odorless as are many chemicals discharged by industry
Vegetation		
Excessive plant growth	Overgrown area	Fertilizers from residential or farm areas; nutrients from food wastes
Inhibited plant growth	Dead, dying plants	Industrial discharges; High or Low pH water; scour from high flows (not pollution)

Guidelines for Visual Inspections Of Stormwater Outfalls

Visual inspections for signs of storm water contamination should be performed routinely. Flows and outfalls should be observed during dry periods to determine the presence of any stains, sludge, odors, and other abnormal conditions.

It is also useful for visual inspections to be made at all stormwater outfall locations during the first hour of a storm event, once runoff has reached its maximum flow rate. Inspectors should examine the discharge for the presence of floating and suspended materials, oil and grease, discoloration, turbidity, foam and odor.

Specific Parameters to look for in completing a visual inspection include the following:

Odor: Discharge odors can vary widely. Some may indicate the source of the contamination. Industrial discharges may smell like a particular spoiled product, oil, gasoline, a specific chemical, or a solvent. For example, the decomposition of organic wastes in a discharge will release sulfide compounds creating an intense smell of rotten eggs. Significant sanitary wastewater contributions will also cause pronounced and distinctive odors.

Color: Color may indicate inappropriate discharges especially from industrial sources. Industrial discharges may be any color. Dark colors, such as brown, gray or black are most common. For instance, flow contaminated by meat processing industries is usually a deep reddish brown.

Turbidity: Turbidity is often affected by the degree of gross contamination. Industrial flows can be cloudy or opaque (highly turbid). Sanitary wastewater is also often cloudy in nature. Erosion is the most common source of cloudy water.

Floatable Matter: A contaminated flow may also contain floatable solids or liquids. Identifying floatables can often aid in finding the source of the contamination because these substances are usually direct products or byproducts of a manufacturing process or sanitary system. Examples of floatables are animal fats, spoiled food products, oils, plant parts, solvents, sawdust, foams, packing materials and fuel.

Deposits and Stains: Deposits and stains (residues) are any type of coating that remains after a non-storm water discharge has ceased. Deposits or stains usually are of a dark color and usually cover the area surrounding the storm discharge. They often contain fragments of floatable substances and at times take the form of a crystalline or amorphous powder. An example is the coating of white crystalline powder formed on sewer outfalls by nitrogenous fertilizer wastes.

Vegetation: Stormwater discharges often affect surrounding vegetation. Industrial pollutants can cause a substantial alteration in the chemical composition and pH of the discharge water, which can affect plant growth even when the source of the contamination is intermittent. For example, nutrients from various food product wastes increase plant growth. In contrast, the discharge of chemical dyes and inorganic pigments from textile mills may decrease vegetation as these discharges are often very acidic. Even when the pollution source is gone the vegetation surrounding the discharge will continue to show the effects of the contamination. In order to accurately judge if the vegetation surrounding a discharge is normal, the observer must take into account recent weather conditions as well as the time of year. Increased or inhibited plant growth near storm water outfalls as well as dead and decaying plants is often a sign of pollution. However, it is important to distinguish whether plant damage is caused by contamination or by the physical effects of increased flows, such as scour.

Structural Damage: Structural damage is also a sign of industrial discharge contamination. Cracked or deteriorated concrete or peeling surface paint at an outfall usually indicates the presence of severely contaminated discharges. Contaminants causing this type of damage are usually very acidic or basic and are usually industrial in nature. For instance, discharges from primary metal industries may cause structural damage because their batch dumps are highly acidic.

References:

EPA Stormwater Management Fact Sheet. Visual Inspection

Global Rivers Environmental Education Network