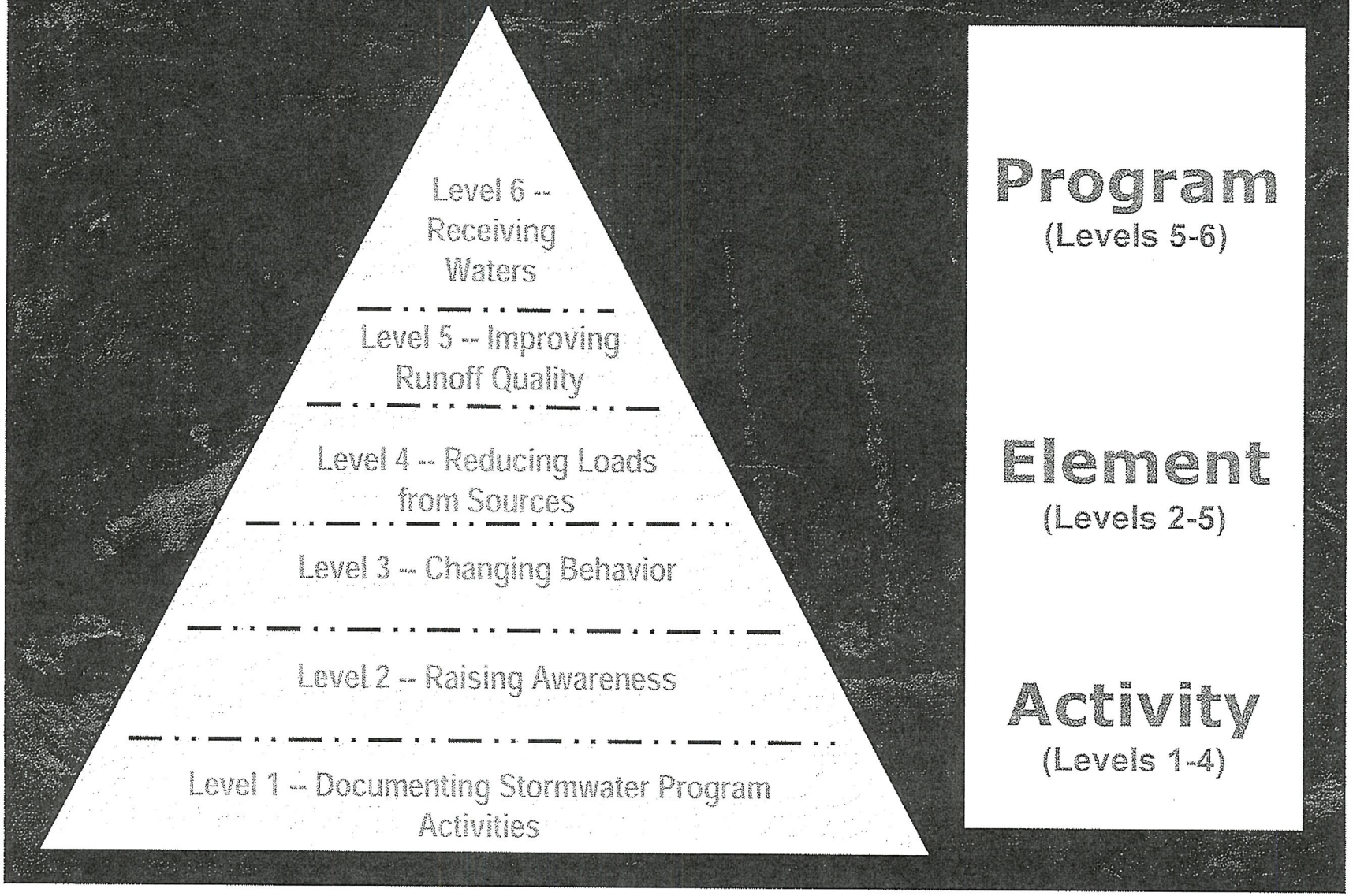
# APPENDIX H

# How Can We Assess Effectiveness?



## GLOSSARY OF TERMS

***Authorized Enforcement Agency:*** Employees or designees of the director of the municipal agency designated to enforce this ordinance.

***Berm:*** An earthen mound used to direct the flow of runoff around or through a structure.

***Best Management Practices (BMPs):*** Includes schedules of activities, prohibitions of practices, maintenance procedures, design standards, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly into the waters of the United States. BMPs also include treatment requirements, operating procedures, educational activities, and practices to control plant site runoff spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

***BOD5:*** A measure of the amount of oxygen that is consumed by bacteria as it breaks down organic matter in a sample during a five-day period under standardized conditions. It is generally considered to be a measure of organic material in the water.

***CIP (Capital Improvement Plan):*** A plan developed by municipalities to identify and prioritize improvements that need to be made in upcoming years.

***Clean Water Act (CWA):*** The federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.), and any subsequent amendments thereto.

***Construction Activity:*** Activities subject to NPDES Construction Permits. These include construction projects resulting in land disturbance of one acre or more. Such activities include but are not limited to clearing and grubbing, grading, excavating, and demolition.

***Conveyance System:*** Any channel or pipe for collecting and directing the stormwater.

***Culvert:*** A covered channel or large diameter pipe that directs water flow below the ground surface.

***Degradation:*** (Biological or chemical) The breakdown of chemical compounds into simpler substances, usually less harmful than the original compound, as with the degradation of a persistent pesticide. (Geological) Wearing down by erosion. (Water) The lowering of the water quality of a watercourse by an increase in the amount of pollutant(s).

***Dike:*** An embankment to confine or control water, often built along the banks of a river to prevent overflow of lowlands; a levee.

***Directly Connected Impervious Areas (DCIA):*** Impervious surfaces that are directly connected to the storm drainage conveyance system. Directly connected means that there is no chance for infiltration or evapotranspiration before entering the conveyance system.

***Discharge:*** The release of stormwater or other substance from a conveyance system or storage container.

***Drainage:*** Refers to the collection, conveyance, containment, and/or discharge of surface and stormwater runoff.

***Erosion:*** The wearing away of land surface by wind or water. Erosion occurs naturally from weather or runoff but can be intensified by land-clearing practices related to farming, residential or industrial development, road building, or timber-cutting.

***Fill:*** A deposit of earth material placed by artificial means.

***First Flush:*** The delivery of a disproportionately large load of pollutants during the early part of storms due to the rapid runoff of accumulated pollutants.

***General Permit*:** A permit issued under the NPDES program to cover a class or category of stormwater discharges.

***Grading:*** The cutting and/or filling of the land surface to a desired slope or elevation.

***Hazardous Waste:*** By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. Possesses at least one of four characteristics (flammable, corrosivity, reactivity, or toxicity), or appears on special EPA lists.

***Heavy Metals:*** Metals of high specific gravity, present in municipal and industrial wastes, that pose long-term environmental hazards. Such metals include cadmium, chromium, cobalt, copper, lead, mercury, nickel, and zinc.

***Illicit Connection:*** Any physical connection to a publicly maintained storm drain system allowing discharge of non-storm water which has not been permitted by the public entity responsible for the operation and maintenance of the system.

***Illicit Discharge:*** Any direct or indirect non-storm water discharge to the storm drain system, except discharges from fire fighting activities and other discharges exempted in this ordinance.

***Illicit Discharge Detection and Elimination (IDDE):*** A program that each municipality develops to identify and eliminate any illicit discharges they might have within their collection system.

***Impervious Surface:*** A surface which prevents or retards the penetration of water into the ground including, but not limited to roofs, sidewalks, patios, driveways, parking lots, concrete and asphalt paving, gravel, compacted native surfaces and earthen materials, and oiled, macadam, or other surfaces which similarly impede the natural infiltration of storm water.

***Individual Permit:*** A permit issued under the NPDES program for a specific facility, whereby the unique characteristics of that facility may be addressed through the imposition of special conditions or requirements.

***Infiltration:*** The downward movement of water from the surface to the subsoil. The infiltration capacity is expressed in terms of inches/hour.

***Ingress/Egress:*** The points of access to and from a property.

***Inlet:*** An entrance into a ditch, storm sewer, or other waterway.

***Low Impact Development (LID):*** This term is used to describe means and methods that can be utilized to reduce the impact of development on the environment.

***Minimum Control Measure (MCM):*** The EPA has identified six areas of focus for MS4s in developing a program to minimize the potential for pollutants to leave a jurisdiction and to enter the waters of the United States. These six areas of focus are called minimum control measures and they include:

1) Public Education and Outreach
2) Public Involvement
3) Illicit Discharge Detection and Elimination
4) Construction Site Storm Water Control
5) Post Construction Storm Water Control

6) Pollution Prevention and Good Housekeeping

***Municipal Separate Storm Sewer System (MS4):*** A municipally owned and operated storm water collection system that may consist of any or all of the following: curb & gutter, drainage swales, piping, ditches, canals, detention basins, inlet boxes, or any other system used to convey storm water that discharges into canals, ditches, streams, rivers, or lakes not owned and operated by that municipality.

***Mulch:*** A natural or artificial layer of plant residue or other materials covering the land surface which conserves moisture, holds soil in place, aids in establishing plant cover, and minimizes temperature fluctuations.

***Nonpoint Source:*** Pollution caused by diffuse sources (not a single location such as a pipe) such as agricultural or urban runoff.

***NPDES (National Pollutant Discharge Elimination System):*** EPA's program to control the discharge of pollutants to waters of the United States.

***NPDES Permit:*** An authorization, or license, or equivalent control document issued by EPA or an approved state agency to implement the requirements of the NPDES program.

***Off-site:*** Any area lying upstream of the site that drains onto the site and any area lying downstream of the site to which the site drains.

***On-site:*** The entire property that includes the proposed development.

***Outfall:*** The point, location, or structure where wastewater or drainage discharges from a sewer pipe, ditch, or other conveyance to a receiving body of water.

***Point Source*:** Any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.

***Plat:*** A map or representation of a subdivision showing the division of a tract or parcel of land into lots, blocks, streets, or other divisions and dedications.

***Pollutant:*** Generally, any substance introduced into the environment that adversely affects the usefulness of a resource. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

***Receiving Waters:*** Bodies of water or surface water systems receiving water from upstream constructed (or natural) systems.

***Retention:*** The holding of runoff in a basin without release except by means of evaporation, infiltration, or emergency bypass.

***Riparian:*** A relatively narrow strip of land that borders a stream or river.

***Riprap:*** A combination of large stone, cobbles and boulders used to line channels, stabilize banks, reduce runoff velocities, or filter out sediment.

***Runon:*** Stormwater surface flow or other surface flow which enters property other than that where it originated.

***Runoff:*** That part of precipitation, snow melt, or irrigation water that runs off the land into streams or other surface water. It can carry pollutants from the air and land into the receiving waters.

***Sedimentation:*** The process of depositing soil particles, clays, sands, or other sediments that were picked up by runoff.

***Sheet Flow:*** Runoff which flows over the ground surface as a thin, even layer, not concentrated in a channel.

***Source Control:*** A practice or structural measure to prevent pollutants from entering stormwater runoff or other environmental media.

***Stabilization:*** The proper placing, grading and/or covering of soil, rock, or earth to ensure its resistance to erosion, sliding, or other movement.

***Standard Operating Procedure (SOP):*** A written description of the standard method of performing a given task. Can include a step by step description. SOP's are developed in an effort to bring consistency to a program and to clearly define the expectations of that program. They should be the basis of training programs for municipal employees.

***Storm Drain:*** A slotted opening leading to an underground pipe or open ditch for carrying surface runoff.

***Stormwater:*** Rainfall runoff, snow melt runoff, and drainage. It excludes infiltration.

***Storm Water Management Program (SWMP):*** A document which describes the Best Management Practices and activities to be implemented by a person or business to identify sources of pollution or contamination at a site and the actions to eliminate or reduce pollutant discharges to storm water, storm water conveyance systems, and/or receiving waters.

***Storm Water Pollution Prevention Plan (SWPPP):*** A document which describes the general plan for addressing storm water pollutants at a given site. The plan characterizes the nature of the potential pollutants, describes methods and concepts for controlling those pollutants and identifies those responsible for the plan.

***Swale:*** An elongated depression in the land surface that is at least seasonally wet, is usually heavily vegetated, and is normally without flowing water. Swales direct stormwater flows into primarily drainage channels and allow some of the stormwater to infiltrate into the ground surface.

***TMDL (Total Maximum Daily Load):*** An acronym for and in this Permit refers to a study that:

1) quantifies the amount of a pollutant in a stream;
2) identifies the sources of the pollutant; and
3) recommends regulatory or other actions that may need to be taken in order for the impaired waterbody to meet water quality standards.

***Total Suspended Solids (TSS):*** An analytical measure of the amount of sediment suspended in water. TSS is typically comprised of larger sediment particles and does not include fine clays and silts that might be dissolved.

***Treatment Control BMP:*** A BMP that is intended to remove pollutants from stormwater.

***Underground Injection Wells (UIW):*** A hole receiving storm water whose top dimension is narrower than the depth.

***UPDES (Utah Pollutant Discharge Elimination System):*** The State of Utah's program to control the discharge of pollutants to waters of the United States.

***Waters of the State:*** Surface waters and ground waters within the boundaries of the State of Utah and subject to its jurisdiction.

***Waters of the United States:*** Surface watercourses and water bodies as defined in 40 CFR § 122.2. including all natural waterways and definite channels and depressions in the earth that may carry water, even though such waterways may only carry water during rains and storms and may not carry storm water at and during all times and seasons.

***Wetlands:*** An area that is regularly saturated by surface or ground water and subsequently characterized by a prevalence of vegetation that is adapted for life in saturated soil conditions. Examples include: swamps, bogs, marshes, and estuaries.

## Common Pollutants, Problems and Potential Sources

SOUTH SALT LAKE PUBLIC WORKS

| Parameter | Definition | Problems with Pollutant | Possible Source of Pollutant |
|---|---|---|---|
| Ammonia Nitrogen, Total ($NH_3$) | Ammonia - gas made up of hydrogen and nitrogen | Very toxic gas | Vegetable and animal waste |
| Ammonium NH4 | Ammonium - soluable salts | breaks down into ammonia | A waste product from animals |
| $BOD_5$ | Biochemical Oxygen Demand - amount of dissolved oxygen needed by aerobic biological organisms | Not a problem by itself - an indicator of how much dissolved oxygen is needed | WWTP--human waste & food residue, food processing, paper industries, Ag runoff--animal droppings, crop residues |
| Cadmium, Total | Naturally occurring metal | Bioaccumulates in tissues, kidney damage, chronic effects when injested | Sewage sludge applied to land, phosphate fertilizers, batteries, metal coating, plastics, fertilizers, cigarettes |
| Calcium, Total | Contribute to water hardness | | |
| COD | Chemical Oxygen Demand - a measure of the amount of organic compounds in the water | COD is an indicator - individual organic compounds create the problem | Organic matter |
| Conductivity | The ability or power to conduct or transmit heat, electricity, or sound | Water by itself is not a good conductor - so when conductivity is high other elements are present | road salts, fertilizers, human activity |
| Copper, Dissolved | soluable in water | Bacteriostatic substance - can be a fungicide. In high concentrations can be poisonous | WWTP, industry, architectural copper, vehicle brake pads, copper-containing pesticides, and marine antifouling coatings; primary discharger might vary with the rainy season |
| Dissolved Oxygen | Oxygen gas dissolved in water | Animal and plant life in water depend on DO | DO in water is consumed as aquatic animals and plants respirate, also by the decomposition of organic matter |
| Dissolved Oxygen, Saturated | A measure of DO | | |
| E. coli | Bacteria | Is used as an indicator of pathogens | Animals and people |
| Hardness (as $CaCO_3$) | Strong presence of calcium and magnesium in water - high mineral content | Creates scum and scale depositions | |
| Lead, Dissolved | soluable in water | Bioaccumulates in tissues, chronic effects--anaemia, neuropsychological disorders | Cars, mining, old paint flecks, old piping |
| Magnesium, Total | Contribute to water hardness | | |
| Nitrate as N | Nitrate | Can cause oxygen depletion - may cause methemoglobinemia - affects humans and animals, especially infants | Soils (natural), fertilizers, manure, feedlots, municipal waste, septic tanks |
| Nitrite as N | Nitrite | Can cause oxygen depletion - may cause methemoglobinemia - affects humans and animals, especially infants | Soils (natural), fertilizers, decaying plant and animal residues, sewage disposal, livestock, etc.. |
| Nitrogen, Total (TN) | Combined nitrogen | | Fertilizers |
| Nitrogen, Total Kjeldahl (TKN) | Sum of organic nitrogen, ammonia and ammonium | total measure of compounds defined seperately | |
| Oil & Grease | | | Restaurants, cars, asphalt surfaces |
| pH | Measure of acidity or basicity | 7.0 is considered neutral - causes problems if too high or too low | Industry, |
| Phosphate, Ortho as PO4 | | Can cause digestive problems in people and animals - stimulates algal growth | Partially treated and untreated sewage, agriculture, fertilizers, detergents |
| Phosphorus, Total (TP) | Phosphorus is a nutrient necessary for the growth of plants and animals | Cause algae growth, which when they die exert a high BOD demand | WWTP--phosphorus based detergents, Agricultural--Fertilizer--runoff, food processing waste |
| Total Dissolved Solids (TDS) | Measure of the combined content of all inorganic and organic substances contained in a liquid - too fine to be removed by sieve | By itself is not necessarily harmful but is an indicator of possible chemical contaminants | Salts--deicing agent for roads in winter, industries; WWTP, industry, pesticides, herbicides |
| Total Suspended Solids (TSS) | Measure of the combined content of all inorganic and organic substances contained in a liquid - larger particles | By itself is not necessarily harmful but is an indicator of possible chemical contaminants | Mining, logging, construction activity |
| Turbidity | | Affects vegetative growth, ability of light to transmit through water | Sediment--eroded soil particles, bacteria |
| Water Temperature | | Alters plant and animal eco system | High temperatures from industry |
| Zinc, Dissolved | Micronutrient - necessary in small amounts | Can be toxic at high levels to organisms | Tire wear, industries |