Doug Henderson

From: "O'Brien, Ed" <eobr461@ECY.WA.GOV>
To:
Date: Monday, December 21, 1998 11:59 AM
Subject: Your request

I've attached a copy of the discussion paper that you requested.

I noted that the last section of the paper re Groundwater is not completed. I don't think it ever was completed because it was addressed under separate guidance developed by the department.

Again, the analyses and recommendations in the report are not the official position of the Dept. of Ecology. This was a paper developed by a staff person to elicit further discussion and policy decisions.

Feel free to call me if you have questions.

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AN ANALYSIS OF REGULATORY ISSUES RAISED BY APPLICATION OF THE NPDES PERMIT PROGRAM TO MUNICIPAL AND INDUSTRIAL STORMWATER DISCHARAGES

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by the Washington Department of Ecology
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BACKGROUND AND PURPOSE:

The application of the NPDES permitting program to municipal and industrial stormwater discharges has raised a number of difficult regulatory questions. Possibly the most difficult of those issues is how to apply the requirement of the Clean Water Act that NPDES permitted discharges must not cause violations of water quality standards in waters which receive those discharges.

This paper provides discussions, explores options, and offers recommendations for answers to the more detailed questions behind that issue. Those questions include:

- What are the "Waters of the State" to which the Clean Water Act and State Water Pollution Control Act requirements apply?
- How do you determine the point of compliance for stormwater discharges?
- What information is necessary to determine whether a discharge is causing a water quality standards violation, and how do you monitor to collect that information?
- Given the large numbers of industries which have technology-based, albeit generic, industrial stormwater permits, how do you begin to verify which must have water-quality based effluent limitations?

The application of water quality standards to municipal and industrial stormwater discharges is a much discussed national topic. Congress is debating a range of stormwater-related statutory changes to the Clean Water Act. Those changes range from explicit extended time frames for certain discharges to comply with adopted water quality standards; to an allowance for the adoption of standards applicable to wet weather situations.

This paper does not discuss those proposed changes. It assumes the current statutory and regulatory structure. It also assumes that the regulatory agencies must evaluate each discharge for compliance with the current water quality standards. Such a regulatory program may be possible, but it is also impractical. It would take many years to fully implement and may be cost-prohibitive to all parties. Regulatory agencies do not have the resources to provide the level of oversight necessary, and small industrial dischargers and municipalities (with hundreds of discharges)

do not have the resources to fully implement such a program.

There are alternative approaches to regulating stormwater discharges which should be explored. Among those are:

- Regulating stream segments which encompass an urban area or watersheds on a macro scale. Rather than requiring every discharge in a segment to comply with standards, require compliance at the downstream end of the segment.

- As part of a strategy to move toward compliance with standards, use effluent goals or targets as surrogates for water quality standards or as indicators of the likelihood of compliance with standards.

This paper does not attempt to explore these and other options, nor to answer all of the questions surrounding application of water quality standards to stormwater.

I. Stormwater Drainage Systems and "Waters of the State"

INTRODUCTION and PROBLEM STATEMENT:

As a prerequisite to defining a point of compliance with water quality standards, we must first define what we mean by the "waters of the state" which the standards apply to. Establishing "waters of the state" definitions will also frame possible options for defining technology-based discharge standards of state law, i.e., what constitutes "all known available and reasonable treatment" (AKART) of stormwater. The further upgradient that the definition of "waters of the state" applies, the less options are available for applying treatment technology prior to discharging to those waters. Court decisions, Pollution Control Hearings Board decisions, and Attorney General Office opinions (formal and informal) have tended to take an expansive interpretation of "waters of the state."

STATE CASE LAW and ATTORNEY GENERAL'S OFFICE OPINIONS:

Building Industries Association of Washington, et al. v. State of Washington, et al.

Summary Statement: Any body of water "above ground and either flowing like a stream, or bigger than a puddle, is properly within the jurisdiction of the Department of Ecology to regulate pursuant to Ch. 90.48 RCW." (Superior Court of Thurston County, No. 91-2-02895-5)

This opinion was given in a case in which the plaintiff challenged Ecology's authority under Ch. 90.48 RCW to regulate isolated intermittent wetlands.

The arguments centered around the interpretation of the definition of the term "waters of the state" as used in RCW 90.48.020, and the use of that term in RCW 90.48.010, 030, and 035. In reaching this opinion, the judge made the following observations on the rules of statutory construction:

> The fundamental objective of statutory construction is to ascertain and carry out the intent of the legislature.
>
> As a general rule, a definition of a term contained in a statute, either expressly or by reference, is binding on the court. In interpreting statutory definitions, "includes" is construed as a term of enlargement while

"means" is construed as a term of limitation.

The judge cited an Attorney General Opinion (AGO 1969 No. 4); referenced dictionary definitions of lake, pond, underground waters, percolating waters, and surface waters; and noted that the purpose of Ch. 90.48 RCW was to protect all (emphasis added) waters of the state. Finally, he allowed that waters of the state can be intermittent, and not associated with other (larger) bodies of water.

In its brief, the Attorney General's Office cited the following cases where intermittent streams and watercourses have been held to be "waters of the state:"

PCHB no. 86-232: The PCHB held that "adjacent *(to the Town Ditch Irrigation Canal)* streams and creeks and Whipple wasteway are "waters of the state."

PCHB no. 84-182, 85-66: The PCHB held that the waters in and under a "stormwater ditch" (between a private building and the road) were waters of the state.

Attorney General Opinion No. 4, 1969

Summary Statements: "[T]he authority of the Water Pollution Control Commission [now the Department of Ecology] over "waters of the state," as defined in RCW 90.48.020, includes the waters within canals, waterways, drains, and reservoirs of the various irrigation and drainage systems in our state."

"[T]he water pollution control commission is empowered by RCW 90.48.035 to adopt water quality standards for waters located in canals, drains, wasteways, and reservoirs of irrigation and drainage systems."

In developing this opinion, the AG described the types of systems it was referring to as follows:

> "These systems are constructed, in most cases, for the purpose of transporting water to lands for agricultural irrigation, or of draining waters from lands so as to make them suitable for agricultural and other uses. Many of these systems contain canals, drains, wasteways, reservoirs and similar facilities. Some of these systems are made up entirely of constructed facilities, while others utilize a combination of constructed facilities and natural watercourses, sinks, lakes and other natural land formations. The waters flowing in many of these systems are quite large in volume; some are located therein because of the efforts of man, while other such systems, depending on the facts of each case, are made up of a combination of natural occurring and "man-occasioned" waters. Waters

> in these facilities are oftentimes used for such diverse purposes as fish and wildlife propagation, feeding and resting areas, and as places for persons to fish, boat, swim and engage in other outdoor recreational activities."

The opinion goes on to cite the history of legislative amendments to Ch. 90.48 RCW; regulations adopted by the Pollution Control Commission; and the lack of objection to those by the legislature, all of which establish that such systems mentioned above are within the authority of Ecology to regulate as waters of the state.

Informal Opinion of an Assistant Attorney General:

In 1990, with new federal stormwater regulations to implement, the Water Quality Program asked for an informal opinion from the Office of the Attorney General (An informal opinion is the opinion of the author. It is not an official position of the Office of the Attorney General.) on the following question:

> "Consistent with existing state and federal law, may Ecology allow a naturally-occurring, man-altered, or made surface water to serve as a treatment system to assure that a designated portion of that surface water will meet state water quality standards?

The response of an Assistant Attorney General was that "the only way Ecology can allow pollution in a "naturally occurring, man-altered, or man-made" channel containing state-owned water is in compliance with Chapter 90.48 RCW." In addition, the response included the following observations:

- "All waters within the State of Washington are owned by its citizens" (RCW 90.03.010).

- "...[W]aters do not seem to lose their character as "waters of the state" and hence their subjection to the prohibition of pollution merely because they are found in man-altered or man-made channels. There are three requirements for being a stream or watercourse of a water of the state: (1) that there be an actual channel; (2) that there be a stream of water; (3) that there be a definite source of supply" [Hutchins Water Rights Laws in the Nineteen Western States, 30 (1970)].

- That the Pollution Control Hearings Board (PCHB) has interpreted the term "waters of the state" quite broadly, and cited these cases:

National Can Corp. v. Ecology: The industry had a spill into a catch basin connected to a storm sewer which discharged to a river. Though no direct evidence of pollutants discharged to the river, the Board concluded a violation of RCW 90.48.080 had occurred.

Courtright Cattle Co. v. Ecology: The drainage from several agricultural facilities had washed pollutants into Lind Coulee. The Board found that though Lind Coulee was a ditch and not a natural stream, it constituted a water of the state.

- The term "waters of the United States" cannot be interpreted as broadly as "waters of the state." Nevertheless, federal courts have interpreted the term "waters of the United States" to include intermittent streams and "any waterway, including normally dry arroyos, where any water which might flow therein could reasonably end up in any body of water, ..." [U.S. v. Phelps Dodge Corp., 391 F. Supp. 1181]. Counsel finishes the aforementioned sentence by adding "... city sewer systems, and water wells," and footnoting a federal court case for each (U.S. v. Velsico Chemical Corporation, 438 F. Supp. 945 (W.D. Tenn., 1976); U.S. Steel Corporation v. Train, 556 F.2d 822 (7th Cir., 1977).

OPTIONS:

Though each has a different perspective or emphasis, the above legal opinions are complementary. To summarize them, "Waters of the state" seems to include any standing water which is bigger than a puddle, and any water flowing like a stream which is in a defined channel. "Waters of the State" may be intermittent or seasonal, and do not have to connect to a larger body of water, i.e., a Water of the United States.

The formal AG's opinion, and the informal opinion, go on to indicate that "waters of the state" can be waters within naturally-occurring, man-altered, or man-made channels. This includes "canals, waterways, drains, and reservoirs of irrigation and drainage systems." The 1969 AG opinion was directed principally at verifying state regulatory authority over the vast irrigation and land draining systems associated with agricultural activities. However, the terms used in those opinions to describe those systems, and the

practice of mixing man-made with natural systems for drainage are applicable to urban drainage systems also.

If we applied the AG's opinion strictly, urban stormwater would be a water of the state from the first instance when it flows into a channel or is detained in a pond. Thus, runoff collected by curb and gutters, roadside ditches, or in catch basins and storm pipes would be "waters of the state;" Stormwater in treatment ponds would be waters of the state also.

Given this background, there are at least three options for further defining "waters of the state" in relation to stormwater drainage.

Option 1:

Use the general principles of the 1969 Attorney General's opinion to distinguish portions of stormwater drainage systems that are "waters of the state."

Interpret the above case law and legal opinions as allowing the position that stormwater within a stormwater drainage system is not a water of the state until such time that it initially enters naturally-occurring or man-altered waters. As long as the drainage flows in man-made channels and impoundments built expressly for drainage, where no naturally occurring or man-altered impoundment or channel previously existed, it is not a water of the state. Where a natural drainage channel has been placed within a ditch, culvert or pipe, the water within it should be considered a water of the state.

Discussion of Option 1:

This interpretation may be inconsistent with the PCHB's conclusions of law in the cases cited above. We could argue that Ecology's interpretation is an extension of the arguments and decisions made thusfar. The drains, wasteways, etc referenced in the 1969 AG Opinion contain waters of the state even under the proposed option. They were ponded or flowing like a stream prior to their introduction to the irrigation or drainage systems.

This interpretation would also be consistent with Chapter 75.20 RCW. At RCW 75.20.100, the statute states:

> "For the purposes of this section and RCW 75.20.103, "bed" shall mean the land below the ordinary high water lines of state waters. This definition shall not include irrigation ditches, canals, storm water run-off

devices, or other artificial watercourses except where they exist in a natural watercourse that has been altered by man." (emphasis added)

Though the Attorney General Opinion of the scope of "waters of the state" in Chapter 90.48 RCW includes water in man-made canals and waterways, the above passage of Chapter 75.20 RCW would not regulate the beds of such systems unless they exist in a natural watercourse altered by man.

If these arguments are unsuccessful, we could consider requesting a statute amendment delineating waters within stormwater drainage systems (other than man-altered or naturally occurring drainages) as not included under waters of the state.

It allows reasonable opportunity for application of treatment/control systems prior to discharge to waters of the state.

It could preclude enforcement against pollution in drainage ditches or man-made ponds which are not connected to a water of the state. Federal CWA case law has established that where it is reasonable to expect a seasonal or intermittent surface water to flow into a year-round body of water, those seasonal or intermittent waters are waters of the U.S. State case law has also established those seasonal or intermittent waters as waters of the state. But where a man-made drainage ditch does not reasonably have an outlet to a water of the state, CWA authority does not apply. In these cases we may be able to apply State Water Pollution Control Act authority in relation to ground water pollution.

Example Situations:

1) Runoff on roads, collected along curbs and gutters, or within storm sewer pipes or ditches constructed within the road right of way - Not a water of the state

2) Runoff on private property in ditches constructed for stormwater transport - Not a water of the state

3) Runoff piped down a ravine which had an established drainage channel prior to construction of the stormwater drainage system - Water of the state

4) Runoff in an urban storm sewer has flowed through a natural drainage channel (or flowed through a pipe which replaces a natural drainage channel) upstream of the storm sewer - Water of the state

5) Runoff in a roadside ditch where a channel did not

exist previous to the road construction. Not a water of the state

6) Runoff in a detention pond, swale, infiltration system, or wetland constructed for the purpose of stormwater treatment or erosion and sediment control - Not a water of the state unless stormwater has already passed through a water of the state.

Option 1A:

Waters within man-made drainage systems are not waters of the state unless such waters have already passed through a naturally occurring or man-altered water. Waters within naturally-occurring or man-altered systems are waters of the state, but Ecology creates a new beneficial use class of "drainage" which may be applied in appropriate circumstances.

Discussion of Option 1A:

In this case, Ecology could allow treatment/detention systems up to the point at which the natural or man-altered drainage has/had beneficial uses other than drainage.

This option faces the combined difficulties of options 1 and 2: it runs counter to the legal background (see discussion under option 1); and it allows AKART to be applied downstream of a water of the state (see references to Ch. 90.52 and 90.54 RCWs under option 2).

It offers the common sense advantages of not designating many man-made drainage channels as waters of the state, and allowing some waters of the state to be designated only for drainage. An example of where we may choose to implement the latter are drainages which were placed within storm sewers and paved over long ago.

Application of this option can become difficult where a discharge from a water of the state must mix with waters within stormwater drainage systems (e.g., drainage from a natural wetland which is located within a complex urban stormwater drainage system.) A case-by-case approach will be necessary for deciding whether the mixed waters are waters of the state. If for whatever reason the mixed waters should be determined waters of the state, application of the "drainage" classification will be appropriate in many instances.

This option also can protect those naturally occurring waters, including small streams and wetlands, which are part

of a storm drainage system but which have retained beneficial uses other than drainage. Water coming into these natural waters should be of sufficient quality to protect their beneficial uses. However, water leaving the natural system and entering a man-made drainage system, can be degraded while in the latter system as long as drainage is the only function.

Option 2:

Apply the case law and Attorney General's office opinions to man-made urban stormwater systems, and possibly to man-made private stormwater systems, i.e., they are waters of the state. Define the beneficial use of such systems as drainage up to the first location at which they intersect naturally-occurring or man-altered waters which have, or had, other beneficial uses. Where a natural drainage channel has been placed within a ditch or pipe, the beneficial uses of that stretch should be considered on a case-by-case basis. Under this option, treatment/detention systems would be allowed up to the point at which the drainage has or had beneficial uses other than drainage.

Discussion of Option 2:

This position seems more consistent with case law and legal opinions which seem to say any flowing water or water larger than a puddle is a water of the state whether man-made or natural. But it creates conflict with other state statutory requirements.

If storm drainage systems are waters of the state, state statutes disallow discharge to them without first applying AKART. At RCW 90.48.080, the discharge of matter which causes pollution of waters of the state is prohibited. RCW 90.52.040 states "...regardless of the quality of water of the state to which wastes are discharged or proposed for discharge, and regardless of the minimum water quality standards established by the director for said waters, [the director shall] require wastes to be provided with all known, available, and reasonable methods of treatment **prior** to their discharge or entry into waters of the state." This requirement is also established in RCW 90.54.020(3)(b).

We have previously defined AKART for stormwater as source control and treatment BMPs. Under this option, it is not possible to comply with the statutory requirement to apply treatment BMPs prior to entry into a water of the state because the drainage system is a water of the state. You need the drainage system to transport the stormwater to the

treatment BMP.

A possible solution to the above problem is to seek statutory amendments which would allow an exception for urban stormwater, including private stormwater, to be discharged to man-made sewer systems, or to other waters of the state which have only a drainage use prior to completing application of AKART.

Example Situations:

In all of the examples given above in Option 1, the runoff would be classified as waters of the state.

Option 2A:

Waters in stormwater systems are considered waters of the state unless they are flowing to a treatment/detention system. Wherever such waters are directed to a treatment\detention system, waters within the drainage system shall be considered a water of the state where they intersect a naturally occurring or man-altered water. Treatment/detention systems could be located downstream of this point only as far as the system has/had drainage as its only beneficial use.

Discussion of Option 2A:

This option is an artificial way of trying to maneuver around the requirement to provide AKART prior to discharging to waters of the state. The approach may add incentive to providing stormwater treatment.

We may need statutory amendments to: (1) make it clear that stormwater collection systems leading to treatment systems are not waters of the state as long as they are not naturally occurring or man-altered; (2) to allow application of AKART downstream of waters of the state which have drainage as their only beneficial use.

RECOMMENDATION:

Regardless of the legal rationale by which the decision is defended, we must be able to allow construction of stormwater treatment systems at practical locations without sacrificing the beneficial uses of waters of the State.

Ecology should proceed under Option 1 or 1A for convenience and strategic reasons. Option 2 would require amendments to the state's most basic water pollution control statutes. We should not risk amending those statutes until we have exhausted other remedies.

Ecology could argue that the legal opinions and decisions to date do not preclude Option 1 or 1A.

II. Points of Compliance for Discharges to Surface Waters

INTRODUCTION AND PROBLEM STATEMENTS:

Problem #1: The location at which the discharge enters a water of the state may not be straightforward. See Section I above. Setting that location is the first step toward solving the problems listed below, and in defining the point of compliance with AKART requirements and water quality standards.

Problem #2: The water quality standards require that "all mixing zones for stormwater shall be based on a volume *(read: volumetric flow rate)* of runoff corresponding to a design storm approved by the department." Ecology has not established an approved design storm for use in this application.

Problem #3: Expanded mixing zones are allowed for storms above the "approved design storm." To obtain a larger mixing zone, certain prerequisites must be met. There isn't any formalized criteria or process available concerning how to meet the prerequisites.

Problem #4: Mixing zones determinations are to consider critical discharge conditions. Critical receiving water conditions for stormwater discharges have not been established.

DISCUSSION OF PROBLEM #1:

If option #1 (see above discussion) is selected to address the waters of the state issue, and a mixing zone is not expressly allowed, the point of compliance is that location at which the discharge enters waters of the state. The quality of the discharge at that location must meet state surface water quality standards.

The following list of example situations is provided to help identify that location.

Example Situations:

1) An urban storm sewer, closed-pipe collection system, collecting runoff from catch basins and discharging to a naturally-occurring or man-altered stream, impoundment, estuary, or marine water. The point of

compliance is the discharge to the naturally-occurring or man-altered water. The point of compliance remains the same if (a) treatment system(s) is/are added anywhere in the collection system.

2) Storm sewers or ditches constructed on private property for stormwater transport which discharge to a naturally-occurring or man-altered stream, impoundment, estuary, or marine water. The point of compliance is the discharge to the naturally-occurring or man-altered water. The point of compliance remains the same if (a) treatment system(s) is/are added anywhere in the collection system.

3) An urban storm sewer pipe collection system, which mixes a closed-pipe collection system with naturally occurring channels and impoundments. The point of compliance is the location at which runoff enters a natural system. If the discharge from the natural system re-enters a closed pipe system which continues to collect stormwater, the point of compliance for the mixed waters is the next location of discharge to a naturally-occurring or man-altered waterway.

4) A roadside storm drainage ditch discharging to a naturally-occurring or man-altered stream, impoundment, estuary, or marine water. The discharge point is the point of compliance provided the ditch did not replace a naturally-occurring or man-altered water.

If option #1A is selected for implementation, there could be more than one point of compliance. First, there would be a location at which any standards applicable to "drainage" uses must be met. Secondly, there would be a location at which standards applicable to any other beneficial uses must be met.

In example #3 above, Ecology would have to decide the applicable standards for the naturally-occurring or man-altered waters on a case-by-case basis. In cases where the waters continue or can support beneficial uses other than drainage, Ecology would assign the water a beneficial use status other than drainage. An example would be a naturally-occurring wetland in the middle of an urban drainage system.

Ecology would be more likely to assign a highest use of "drainage" to instances where the waters lost beneficial uses other than drainage years ago. For example, water in a storm sewer pipe, in an urban setting, which replaced a small creek system and was covered over many years ago.

DISCUSSION OF PROBLEM #2:

Introduction:

Our existing Water Quality Standards (Chapter 173-201A WAC) allow the establishment of mixing zones for discharges, provided supporting information meets four prerequisites:

- the mixing zone would not have a reasonable potential to cause a loss of sensitive or important habitat,
- substantially interfere with the existing or characteristic uses of the water,
- result in damage to the ecosystem, or
- adversely affect public health as determined by the department.

Water quality criteria must be met outside the boundary of a mixing zone. A smaller zone, within the mixing zone, in which acute criteria may be exceeded can also be established provided the duration and frequency of exposure to the discharge will not create a barrier to the migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.

The rule also: establishes maximum size limitations; places restrictions on overlapping of mixing zones; and requires minimization of mixing zone sizes.

For stormwater discharges up to a volumetric flow rate associated with a design storm event, a mixing zone may be granted in accordance with the above limitations and restrictions. The permit writer must use the design storm flow rate, in conjunction with discharge concentrations and receiving water conditions to establish the boundaries of the mixing zone. The mixing zone can not be larger than necessary to meet standards, and can not exceed the maximum size limitations.

Establishment of a larger mixing zone applicable to precipitation events greater than the approved design storm may be allowed if the discharger demonstrates:

- all appropriate BMP's have been applied,
- it can meet the four prerequisites listed above, and

· the proposed mixing zone does not create a barrier to the migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.

Establishment of the Design Storm:

Given the difference in the time frames of the acute and chronic standards (acute standard is of one hour duration or instantaneous; chronic standard is four days) it is appropriate to use different design storms from which to estimate possible mixing zones, and whether more stringent effluent standards are necessary.

For the acute standard, the recommendation is to use the peak one-hour flow generated by the 2-year, 72-hour storm event, or 2) use the average flow generated by the 2-year, 2-hour storm event. The latter is probably more appropriate. The run-off flowrate from this storm event is likely to be higher than the peak from the 2-year, 72-hour event. However, it may be appropriate to verify that assumption through run-off modeling of both storms.

2-year, 2-hour event: These short duration intense storms typically occur in the summer, regardless of geographic location in the state. This corresponds with lower receiving water flows, and greater potential for greater pollutant build-up on the urban landscape. The Ecology publication, Dam Safety Guidelines, Technical Note 3: Design Storm Construction, includes isopluvials for this storm event. They can also be found in NOAA Atlas No. 2, Precipitation - Frequency Atlas of the Western United States, Volume IX. For purposes of this exercise, the appropriate regional short duration hyetograph in Appendix C of the reference can be used to develop a synthetic storm. This hyetograph then serves as the input for producing a runoff hydrograph. *The above-referenced text explains how to calculate adjustments to the precipitation volume depending upon size of the watershed (see page 5).*

2-year, 72-hour event peak flow: This would represent the peak intensity of a long duration event. It typically occurs during the rainy season. Though the peak runoff flow may not be as high as the 2-year, 2-hour event, and the receiving water flow not as low, it could still be the critical discharge situation depending upon other variables, such as the concentration of pollutants of concern in the receiving water and in the runoff.

For the chronic standards, the logical choice is to use an estimate of the average run-off from the 2-year, 72-hour event. An event of 3-years, 96-hour return interval would correspond with the chronic water quality standards. However, the rainfall amounts for events of that duration/frequency are not readily available. Also, the actual discharge time period from a rain event can extend significantly beyond the actual rain event due to a long basin runoff time of concentration. So, it is appropriate to use an event with a more frequent return interval.

2-year, 72-hour event isopluvials are readily available in the references cited above. The hyetographs in Appendix C of the Ecology document can be used to develop the synthetic storm. For increased accuracy, the directions in the referenced document can be followed to correct for basin size and elevation. Once the runoff hydrograph is generated, the suggestion is to use the average discharge flow rate for the highest 72-hour period. The actual flow rate will be higher and lower than this value for the course of the storm. The actual amount of runoff fluctuation depends upon the runoff characteristics of the watershed (e.g., time of concentration).

The time of concentration, and the discharge characteristics of a basin can be drastically changed through implementation of BMP's. For example, a large detention basin can dampen runoff peaks, extend the period of discharge, and reduce pollutant concentrations. It may be appropriate to use additional storm events of higher frequency, and shorter duration for modeling purposes if application of retention facilities in the basin extends the discharge period to around 96-hours or longer.

Permitting Strategy:

Application of these storm events to predict compliance with water quality standards is necessary given the time/frequency nature of the standards. However, Ecology has encouraged use of the 6-month, 24-hour storm event for sizing of treatment BMP's. This storm event was selected because of size and cost considerations. For storm volumes in excess of that generated by the 6-month, 24-hour event, the incremental cost of treatment vs. volume treated begins to escalate rapidly.

Ecology's strategy for bringing most municipal and industrial dischargers into compliance with all the requirements of the Clean Water Act and state laws, is to

initially require all dischargers to apply AKART, and in the case of municipal dischargers, MEP. Thus, Ecology is not routinely requiring assessments of stormwater dischargers for compliance with water quality standards. However, where Ecology has identified certain discharges as a high priority for concern, it reserves the right to require monitoring and analyses for determining compliance with standards. The goal is to eventually verify that the discharges are in compliance.

Ecology anticipates that any required monitoring will focus on the discharge quality and quantity. Where mixing zones aren't assigned, the discharge must meet water quality standards applicable to the receiving water. Where mixing zones are granted, the discharge must meet an assigned effluent limitation which is computed based upon modeling of the discharge and the critical receiving water condition. Receiving water monitoring at the downstream edge of an assigned mixing zone, i.e., at the actual point of compliance, will not be the preferred option.

DISCUSSION OF PROBLEM #3:

Introduction:

In regard to establishment of mixing zones, the Permit Writer's Manual notes that there are not criteria or processes for making determinations regarding achievement of the prerequisites listed above (with the exception of the application of all appropriate BMPs), nor in how to minimize the mixing zone. In the absence of any site specific information to guide the decision, the manual directs the permit writer to "authorize dilution zones up to the maximum size allowable under the discharge situation."

That guidance is not applicable to stormwater dischargers given the first sentence of WAC 173-201A-100(10)(c). For storms up to the design storms recommended above, the permit writer must determine a mixing zone, no larger than necessary to meet standards, but not larger than the maximum allowed by the water quality standards. The writer then applies any site specific information which would indicate an even smaller zone is advisable.

The water quality standards allow larger mixing zones, and overlapping zones, for larger storm events provided the prerequisites are met. But there currently isn't any guidance to the permit writer concerning how to set the boundaries of such larger zones other than the restrictions of the prerequisites.

I DISAGREE W/ECOLOGY'S INTERPRETATION THAT LARGER STORMWATER MZ MAY BE ALLOWED SOLELY FOR EVENTS EXCEEDING THE APPROVED DESIGN STORM. RATHER, I FEEL 10C IS INTENDED TO EXPRESSLY ALLOW EXCEEDANCES DUE TO EVENTS GREATER THAN THE APPROVED DESIGN STORM, NOT EXCLUDE EXCEEDANCES FOR OTHER REASONS.

Here are some options to this situation:

1) Ecology allows use of the usual maximum mixing zone size criteria for stormwater discharges from storms exceeding the design storm, and without allowances for overlap, on a routine basis as it does with other discharges. Dischargers who apply for larger mixing zones as allowed by WAC 173-201A-100(10) must provide evidence to allow a decision concerning compliance with the prerequisites;

2) Ecology establishes default criteria for larger mixing zones which can be used unless site specific information is available which makes authorization of a larger zone questionable in light of application of the prerequisites.

As a point for further discussion, an option for larger mixing zone criteria is presented here:

· *the mixing zone within which chronic standards may be exceeded can extend across the full stream width, and as far downstream as necessary to ensure complete mixing with the receiving water.*

· *allow up to the maximum size allowance for the chronic mixing zone (WAC 173-201A-100(7)) for the zone within which acute criteria may be exceeded.*

Rationale: Many stormwater discharges are to small streams. In storm situations, a significant portion of the flow in small urban streams is stormwater runoff.

DISCUSSION OF PROBLEM #4:

Mixing zone determinations are to consider "critical discharge conditions" (WAC 173-201A-100). Critical discharge conditions include assumptions of flow and background concentrations. For continuous discharges to streams, critical conditions have typically been established as the seven consecutive day - ten year low flow with background receiving water concentrations estimated from the 90th percentile value derived from a cumulative frequency distribution analysis.

Pollutants in stormwater discharges which are most likely to cause an exceedence of a numerical water quality standard include: temperature, turbidity, fecal coliform bacteria, and metals. The first three parameters do not have a time dependent aspect. The critical receiving water conditions for them are the same as they are for continuous discharges.

The standards for metals include time and frequency components, and a more detailed discussion of appropriate critical conditions is in order.

Temperature: The critical condition is when the ambient temperature of the receiving water is the highest. The point of compliance is the edge of the chronic mixing zone, if one is allowed.

Bacteria: The critical condition is the 7-day/10-year flow. The bacteria standard applies at the edge of the chronic mixing zone, if one is allowed. The suggestion is to use the chronic mixing zone boundary established for metals.

Turbidity: The permit writers manual indicates that turbidity does not have a linear response to dilution. Any data that indicates a violation of standards should be verified in the field. The suggestion is to use the chronic mixing zone boundary established for metals as the point of compliance.

Metals: For estuaries and marine waters the critical flow conditions should be determined in the same manner as for continuous discharges. For freshwater streams, a 7-day/10-year flow regime seems to be more conservative than necessary for determining the reasonable potential of stormwater discharges to cause a violation of standards for metals, and in estimating a point of compliance.

Stormwater discharges are not continuous discharges. The relative amount of time per year in which discharges occur varies across the state with rainfall patterns. But the chances of having a precipitation event (or snowmelt) which causes a four-day stormwater discharge (corresponding to the chronic water quality standards for most metals) during a 7-day/10-year flow are small for any region of the state. A different critical flow condition should be defined for stormwater discharges. From the standpoint of convenience using readily available flow data is desireable.

Acute standards: The acute standards for metals are one-hour concentrations not to be exceeded more than once every three years. USGS standard flow data includes estimates of the lowest mean flow for a single day, for one through 100-year time periods. The standard flow rates which correspond best with the acute standards are the 1-day/5 year, and the 1-day/2-year rates (i.e., an exceedence probability of .20 and .50). A 1-day/3-year flow rate can be interpolated from the data. Within a physical boundary determined by the restrictions of WAC 173-201A-100(8), the permit writer may use the above flow rates to estimate

compliance with acute criteria for metals.

If historical flow data to this level of detail are not available, explore possibilities of drawing streamflow rate analogies with data from the first downstream water for which the data exist. Estimates can be made based on relative drainage basin sizes and percentages of impervious surface.

Chronic Standards: The chronic standards for metals are four-day averages not to be exceeded more than once every three years. Based on 24-hour rainfall records at Sea-Tac Airport, and using 0.10 inches as the threshold for rain producing significant runoff, the only months which did not have four consecutive days of rain less frequently than once every three years were June and July. For Puget Sound area stormwater discharges, the suggestion is to use the lowest reported monthly mean receiving water flow rate occurring from August through May at a discharge exceedence probability of .20 (i.e., a five-year mean low flow for the lowest month). The selection of the five-year return interval is intended to offset the lack of a readily available four-day low flow for these months. August through October are the likeliest months for the lowest rate.

Background Receiving Water Concentrations:

The permit writer must make assumptions or have data for background receiving water concentrations to:

determine the size of the chronic mixing zone, or

to require lower effluent concentrations if the available dilution is inadequate to meet standards at the edge of a maximum size dilution zone.

The permit writer should follow the recommendation of the Permit Writers' Manual, to use the 90th percentile value derived from a cumulative frequency distribution analysis of all of the available concentration data unless more pertinent data is available. More pertinent data could include:

1) data taken within the receiving water during and immediately after rainfall events. Receiving waters in urban areas are likely to have elevated background concentrations of heavy metals and bacteria, and have higher temperatures during rainfall events. This is due to the stream being impacted by non-point and point source

stormwater run-off. The result could be that a mixing zone is not possible because background concentrations already exceed water quality standards. It is doubtful that the permit writer will have easy access to records indicating weather conditions for days on which a stream was gauged.

2) data taken during the wet season months of November through March, which may be more appropriate for use in determining the chronic mixing zone. Data taken in dry months may be more appropriate for use in determining compliance at the edge of an assigned acute mixing zone, since a one-day low flow is the critical flow condition.

III. Point of Compliance with Sediment Management Standards

INTRODUCTION AND POINT OF COMPLIANCE DETERMINATION:

The Sediment Management Standards (Chapter 173-204 WAC) require compliance with those standards unless a sediment impact zone or a sediment recovery zone has been authorized. Sediment impact zones are established on a case-by-case basis after analysis of the discharge and receiving water conditions through application of computer modeling. There are no explicit size limitations to a sediment impact zone in the standards. However, there are maximum chemical and biological effects criteria which are not to be exceeded within the assigned sediment impact zone.

The sediment management standards adopted in 1991 allowed stormwater dischargers to exceed the maximum criteria within the impact zone if the discharger had an approved time schedule from Ecology for application of best management practices. The proposed standards, scheduled for adoption in December 1995, eliminates this allowance.

COMPLIANCE MONITORING:

It is most appropriate to assess compliance with sediment management standards by monitoring the receiving water sediments. However, if it is necessary to project whether a stormwater discharge would cause a violation of sediment management standards, it is possible through monitoring and modeling tools.

Through its Sediment Management Standards, Ecology requires application of "CORMIX," "WASP4," or an alternate sediment impact zone model(s) approved by Ecology. To run the model, inputs of receiving water and discharge characteristics are necessary. Pursuant to WAC 173-204-400(5), Ecology is authorized to specify, in discharge permits, the locations and methods for collection and analysis of representative samples of wastewater, receiving water, and sediments to evaluate the potential for the discharge to cause a violation of sediment standards. In determining the appropriate monitoring requirements, WAC 173-204-400(6) requires Ecology to consider the following factors:

- Discharge particulate characteristics;
- Discharge contaminant concentrations, flow, and loading

rate;

- Sediment chemical concentrations and biological effects levels;
- Receiving water characteristics (e.g., vertical density profiles, ambient current velocities);
- Geomorphology of sediments;
- Cost mitigating factors such as the available resources of the discharger;
- Other factors determined necessary by Ecology

Given the varibility in stormwater characteristics, the amount of data needed to define concentrations and loads is substantial. Please refer to the discussion in the **Monitoring Frequency** section of **Part IV, Monitoring of Stormwater Discharges to Determine Compliance with Surface Water Quality Standards.**

When adequate discharge and receiving environment characteristics have been defined (a case-by-case determination by Ecology), the model is applied to estimate whether sediment standards will be violated. The model may also be used to back calculate an effluent quality which would be necessary to not violate the standards, or to meet standards outside of a prescribed impact zone. That effluent quality can be established as an effluent limit.

PERMITTING STRATEGY:

As a practical matter, it would be impossible to take all of the thousands of stormwater discharges through the steps described above. Such a level of detailed analyses will probably be reserved for the most egregious discharges or discharges involved in Superfund sites. For the remaining discharges, it may be useful to apply a strategy of establishing effluent goals or targets.

Under this strategy, dischargers are given effluent quality goals, which if achieved, would indicate that they have a significantly reduced potential to cause a sediment management standard violation. To implement this strategy, Ecology would have to develop representative municipal and industrial stormwater discharge case studies to assist in the development of the effluent goals. The results of the case studies should identify:

- Predictions of whether or not applicable sediment quality standards are or will be violated and appropriate discharge effluent goals to prevent any exceedance;

- Whether a sediment impact zone typically is or will be needed, its dimensions and other features required of impact zones.

- A recommended end-of-pipe monitoring program to evaluate the performance of a stormwater discharge in meeting recommended discharge effluent goals.

IV. MONITORING OF STORMWATER DISCHARGES TO DETERMINE COMPLIANCE WITH SURFACE WATER QUALITY STANDARDS

PROBLEM STATEMENT:

Determining whether a stormwater discharge has violated a numeric water quality standard is difficult given the variable quality of stormwater and the time and frequency parameters of some water quality standards. The following discussion assumes that the monitoring location is the effluent discharge. The discharge itself must comply with receiving water standards if a water quality mixing zone is not assigned. If a mixing zone is assigned, compliance will be based upon comparison of the discharge with an effluent limitation. The effluent limitation is assigned based upon application of a dilution model to the discharge and the critical receiving water conditions.

MONITORING LOCATION:

The monitoring location shall meet all of the following criteria:

The discharger shall sample the discharge downstream of all pollution sources and BMP's.

The sampling location shall be upstream of all additions of offsite flow. Offsite flows mean flows from other properties or drainage areas which are not the focus of the study. If it is not possible to isolate the discharge from offsite flows, the quality of offsite flows shall also be monitored so that their relative contribution can be determined.

The sampling location shall be upstream of all waters of the state unless the state has designated a water as serving only a drainage function (a suggestion discussed under Options 1A, 2, and 2A of **Part I. Stormwater Drainage Systems and Waters of the State.**

PARAMETERS AND ANALYTICAL METHODS:

Where temperature impacts are a concern, temperature measurements must be taken directly in the field. Samples

for fecal coliform analysis shall be grabs. If only one sample is required, it should be taken within the first 30 minutes of discharge. The more samples taken the greater the information basis upon which to make comparisons with the applicable standards.

Metals are the parameters of primary concern with most stormwater dischargers. Occasionally, organics may also be of concern. USEPA has recently revised criteria for the following dissolved metals: arsenic, cadmium, chromium, copper, lead, mercury (acute only), nickel, silver, and zinc. For comparisions with water quality criteria for these metals, it is advised that dissolved metals fraction be determined. If selenium or mercury are of concern, total concentrations need to be measured. Note that for comparison with sediment management standards, it may be necessary to analyze the suspended sediments for total recoverable metals concentrations.

MONITORING FREQUENCY:

Analyses of stormwater quality monitoring data, has shown that event mean concentrations are characteristically lognormally distributed, with coefficients of variation (COV = ratio of standard deviation to the mean) in the range of 0.5 to 1.0. Starting with these assumptions, it is possible to compute the reasonable potential of a discharge to violate water quality standards given any sized set of data (Gilbert, 1987, Statistical Methods for Environmental Pollution Monitoring.

To more accurately estimate whether standards would be violated, it would probably be necessary to monitor at least eight storm events from which to evaluate whether chronic water quality criteria are likely to be violated by a particular discharge. Once sampling has begun, the discharger should perform statistical analyses of the data to more specifically identify the number of samples that are necessary to determine whether the chronic criteria are likely to be exceeded within a defined confidence limit. Ecology may set that confidence limit at 95% for regulatory consistency.

The procedure described on page 17.16 of Maidment (1992) is an example of an approach to use. Other approaches include the following which is an excerpt from Ecology's Draft "Stormwater Quality Guidance Manual," prepared by Woodward-Clyde Consultants.

> *"A statistical-based model, such as the Federal Highway Administration Model (Driscoll et al. 1990), can be*

used to characterize the variability of pollutant loading and concentrations, including the expected frequency of exceeding water quality criteria. A dynamic model also can calculate the expected frequency of exceedances. In addition, a dynamic model can account for the variability inherent in stormwater discharge data, including variations in concentration, flow rate, and runoff volume. Thus, it can be used to calculate the entire frequency distribution (i.e, the probability distribution) for loadings from the outfall or subbasin. This enables the modeler to describe the effects of observed discharges on receiving water quality in terms of the frequency of at which water quality standards are likely to be exceeded. Dynamic models include EPA's Stormwater Management Model (SWMM) and Hydrologic Simulation Program (HSPF), the USACE Storage, Treatment, Overflow, Runoff Model (STORM), and Illinois State Water Survey's Model QILLUDAS (or Auto-QI) (EPA 1992)."

Before using the dynamic models described above, the discharger may compute receiving water concentrations of pollutants of concern using critical discharge and receiving water conditions. By demonstrating compliance under these conditions, the discharger would demonstrate the improbability of violations.

The likely critical conditions for demonstrating compliance with chronic water quality criteria for metals and organics are as follows (See discussion in **Part II. Points of Compliance for Discharges to Surface Water**):

Discharge Flow: The average flow for the highest 72-hour period resulting from the 2-year, 72-hour storm event

Discharge Concentration: The event mean concentration for the above event at a 95% confidence limit.

Receiving Water Flow: For Puget Sound area discharges, use the the lowest reported monthly mean receiving water flow rate ocurring from August through May at a discharage exceedence probabillity of .20 (i.e., a five-year mdan low flow for the lowest month).

Receiving Water Concentration: The 90th percentile value derived from a cumulative frequency distribution analysis of available concentration data.

For determining whether acute criteria are violated, much of the same statistical requirements described above for

chronic criteria evaluations is appropriate. In addition, it will be particularly important that the sampled storms include at least one storm which is representative of a significant event after an extended dry period. Such events more commonly occur in the late summer/early fall. The first significant event of this time period is most likely to have elevated pollutant runoff concentrations and/or loads. When coupled with the fact that low receiving water flows are also common at this time, it represents the most likely occurrence of acute criteria violations.

The likely critical conditions for demonstrating compliance with acute water quality criteria for metals and organics are as follows (See discussion in **Part II. Points of Compliance for Discharges to Surface Water**):

Discharge Flow: The average flow generated by the 2-year, 2-hour event, or the peak flow from the 2-year, 72-hour event flow.

Discharge Concentration or Loading: Use the peak concentration (for no mixing zone) or peak loading (mixing zone) recorded during a one-hour interval, as increased by a factor to represent a 95th percentile value.

Receiving Water Flow: Lowest mean flow for a single day at an exceedence probablility of .20 or .50 (i.e., the 1-day/5year, and the 1-day/2-year flow rates.)

Receiving Water Concentration: same as above.

RECEIVING WATER MONITORING:

Because the acute and chronic criteria for metals depends upon the hardness of the receiving waters, it is necessary to collect or verify the availability of this background information.

SAMPLING METHODS:

For discharges which have not been granted mixing zones:

The discharger should collect one or more one-hour composite samples during the first few hours of a storm. The composite samples may be taken with a continuous sampler or as a combination of a minimum of three aliquots from three grab samples taken at least 15 minutes apart for each composite sample. Aliquot volumes may be composited on a time-weighted basis (i.e., equal volumes). However, if the discharger may apply for a mixing zone, the samples must be

collected on a flow-weighted basis. Analyses from these samples shall be compared against the acute criteria. Aliquots shall be of sufficient size to allow analyses of the composite for all pollutants of concern.

The discharger should also collect a composite sample to represent the quality of the remaining discharge event. A time-weighted composite sample shall suffice unless the discharger wants to retain the option of applying for a mixing zone. If so, the composite must be collected on a flow-weighted basis. The composite samples may be taken with a continuous sampler or as a combination of a minimum of three aliquots from three grab samples taken at least 15 minutes apart for each hour of remaining discharge. Sampling shall continue throughout the entire discharge event. The procedures for combining aliquots of individual samples to form a flow-weighted composite are described on pages 39-43 of the USEPA's "Guidance Manual for the Preparation of NPDES Permit Applications for Storm Water Discharges Associated with Industrial Activity."

The pollutant concentrations in this sample and the one-hour composites described above shall be mathematically combined and compared to the chronic standards. They should also be compared to the concentrations of the composite(s) from the first hour(s) of the discharge. If the concentrations in the composite representing the remaining hours of discharge are equivalent or higher than concentrations in the first hour(s), the sampling procedure shall be re-evaluated for future storm event sampling. The goal should be to adjust or expand the time during which the one-hour separate composite samples are taken in order to identify the highest one-hour average concentration. The highest one-hour concentration may vary among pollutants and with the type of storm event. If this appears to be the case, a decision must be made whether to collect individual one-hour composites for each subsequent monitored storm event, or to select (a) default time-frame within which (a) one-hour composite(s) will be collected.

Words of caution:

> Allowing flow-weighted composites to be used for comparision to water quality concentrations introduces another error possibility. Results from the Santa Clara Valley Nonpoint Source Monitoring Program indicated, for a large watershed with significant suspended sediment concentrations (200-400 mg/L) peak total metals concentrations are generally 1.5X the flow-weighted composite concentrations.

It may not be possible to program an automated sampler to collect a sufficient number of samples in a very short, intense storm to ensure that the results are representative.

For discharges which have been granted a mixing zone:

For determining compliance with acute water quality standards, accurate estimation of loadings is essential. It is not possible to predict the timing of the peak loadings of an impending storm event discharge. Therefore, if comparisons to acute water quality criteria are desired, it will be necessary to collect one-hour, flow-weighted composite samples for the length of the storm event. The composite samples may be taken with a continuous sampler or as a combination of a minimum of three aliquots from three grab samples taken at least 15 minutes apart for each composite sample. The procedures for combining aliquots of individual samples to form a flow-weighted composite are described on pages 39-43 of the USEPA's "Guidance Manual for the Preparation of NPDES Permit Applications for Storm Water Discharges Associated with Industrial Activity."

This level of analysis becomes very expensive quickly. Laboratory analyses for total recoverable and the dissolved fraction of one metal (Cd, Cu, Pb, or Zn) in one sample will cost about $80. A six-hour discharge will have six composite samples for a cost of $480 per metal. It may be possible to reduce costs by using one metal as an indicator for all metals. However the discharger would have to verify a relatively consistent relationship of concentrations among the metals.

For determining compliance with chronic water quality standards, the discharger should collect a flow-weighted composite sample for the length of the discharge event.

V. DISCHARGER RANKING CRITERIA

INTRODUCTION:

Statewide Regulation of stormwater discharges through the federal NPDES permit program is a relatively new undertaking for water pollution control agencies. In some ways, regulating stormwater under the NPDES permit program has proven to be a substantial challenge. Not the least challenge, is how to apply the technology-based, and water-quality based requirements of the Federal Clean Water Act and applicable state water pollution laws (Chapter 90.48 RCW) to stormwater discharges.

Ecology has taken the first steps in its strategy for regulating stormwater discharges under NPDES permits. Those steps included: identifying those required to obtain a permit; issuing general permits which incorporate generic technology-based requirements for industrial and municipal stormwater discharges (i.e., implementation of Stormwater Pollution Prevention Plans (SWPPP's), including application of identified Best Management Practices (BMP's)); managing the day-to-day administrative functions of the permitting program; and providing technical assistance to permittees.

The next steps in the evolution of the stormwater permit program are evaluating and improving upon SWPPP's; and identifying which dischargers may need to go beyond application of technology-based requirements to comply with water quality standards.

STRATEGIES FOR IDENTIFYING DISCHARGERS WHICH HAVE A HIGH POTENTIAL TO VIOLATE WATER QUALITY STANDARDS

The Baseline General Permit for Stormwater Discharges Associated With Industrial Activities includes the following special condition:

S7. Assessment of the Potential for Standards Violations by Industrial Facilities

This permit may be modified prior to November 18, 2000, to require the following:

1. An assessment by permittees of the potential for stormwater discharges to cause violations of surface water quality, ground water quality, or sediment managment standards. The assessment shall be based

upon criteria provided by Ecology.

2. A monitoring plan for any facility whose stormwater discharge is determined to have a high potential for violating surface water or ground water quality, or sediment management standards.

Ecology included this as a permit condition to inform permittees under the baseline general permit of Ecology's intended plan to determine which dischargers may continue to have adverse water quality impacts despite implementation of their SWPPP. Ecology has considered a number of strategies for identifying such dischargers. Due to limited resources, any proposed strategy poses difficult implementation challenges.

Most of the strategies conceived by staff involved information management activities which would require a significant amount of time. Reassignment of staff away from other planned activities such as technical assistance and stormwater manual development would be necessary. Ecology has not made the decision to implement any proposed strategy on a specific time frame, but is considering at least the three strategies described below. Strategy #1 is presented in more detail because Ecology staff have spent considerable time developing it. The other strategies are presented only in summary format.

Strategy #1:

Under this strategy, Ecology conducts a series of screening exercises to whittle down those facililities which receive increasing scrutiny.

Step 1: As a first step in identifying facilities which may have the highest potential for causing water quality violations, Ecology has conducted a desktop screening of permittees. The screening involved the following decisions:

- All Category 11 facilities were eliminated because they are generally assumed to be engaged in "light industrial" activities. The vast majority of them would have a lesser likelihood of severely contaminating stormwater. Detailed attention to each of them is an inefficient use of limited resources. Those Category 11 facilities which are found to have water quality impacts based on site inspections can be added to the list of industries requiring follow-up action.

- Facilities whose area with industrial activity totaled

less than 2 acres were eliminated from further consideration on the assumption that smaller facilities have less area in contact with stormwater, and therefore less potential to contact stormwater than larger facilities. Again, individual small sites can be added back to the list based on individual knowledge of inspectors.

The SIC codes of the remaining active permittees were reviewed. Based on judgements concerning likely activities and materials at those sites, permittees classified under the following SIC codes were deleted from consideration:

2448 - Wood Pallets and Skids
2452 - Prefabricated Wood Buildings and Components
3315 - Steel Wiredrawing and Steel Nails and Spikes
3355 - Aluminum Rolling and Drawing
4100 - Local and Suburban Transit and Interurban Highway Passenger Transportation
4200 - Motor Freight Transportation and Warehousing
4400 - Water Transportation
4581 - Airports, Flying Fields, and Airport Terminal Services
5153 - Farm-Product Raw Materials

This initial screening process reduced the total number of active permittees being scrutinized from 1437 to 464. This list can be amended based on on-site knowledge of specific facilities by Ecology field inspectors.

Step 2: The next screen is a self-evaluation checklist. Proposed checklists are presented in Appendix A. Most facilities would receive the generic checklist. Separate checklists have been developed for Auto Dismantlers and for Wood Products industries with log handling facilities. Ecology has spent considerable time evaluating pollution sources and developing SWPPP implementation guidance for these industry groups. The checklists for these industries have been developed to evaluate how the guidance has been interpreted and implemented.

Checklists would be completed by those permittees passing the first screen. The purpose of the checklists are to gather information about the quality of the permittees' Stormwater Pollution Prevention Plans (SWPPPs). The quality of the plan will receive an overall grade. That grade will be one factor in deciding which permittees will receive further scrutiny. Other factors which could be used include:

Size and Type of Receiving Water: This is considered a

critical factor. A discharge of a particular quality and size may cause water quality problems in a smaller, sensitive receiving water, but not in a large, less sensitive water. Despite this, Ecology decided not to include questions concerning information on receiving waters in the checklist. Permittees have already supplied this information in their Notice of Intent (NOI) for coverage under the permit. Ecology's experience has been that this information is often incorrect or inaccurate. Therefore, if Ecology wishes to use receiving waters as a factor, it will have to make assumptions on receiving waters based upon the geographical location of the facility. We anticipate using the department's Geographical Information System (GIS), and municipality records to help make these judgements.

Any available data concerning the quality of a discharge: The next screening step will be a monitoring requirement. If a particular permittee already has discharge quality data, it can influence whether to require them to perform additional monitoring.

Ecology considers the three evaluation checklists in Appendix A to be a reasonable approach for evaluating permittees. However, before deciding to implement this strategy, Ecology has to complete internal and external reviews of these checklists. In particular, Ecology must present the checklists to its Technical Advisory Committee for the development and implementation of the industrial stormwater permit program.

The Technical Advisory Committe is comprised of representatives of permitted industries, consultants, municipalities, and environmental organizations. This committee has been invaluable in helping develop and implement the industrial stormwater permit program. Ecology will consider the comments of the members of this committee before making final decisions on this overall strategy and the content of the checklists.

Subsequent Steps:
Using the checklists and considering other factors listed above, Ecology will develop ranking(s) of permittees based on Ecology's interpretation of their potential to cause a violation of standards. Depending upon the extent of its available resources, Ecology will decide how many of the top-ranked permittees will receive further scrutiny.

That further scrutiny will begin with monitoring requirements to characterize the quality of the stormwater

discharge(s) from the permitted site. Monitoring requirements could be identified through an amendment to the baseline general permit. Under an alternative management strategy, Ecology could revoke coverage under the general permit for these facilities, and put them under individual permits with monitoring requirements. However, such action may be more appropriate pending the results of the required monitoring.

Strategy #2:

Under this strategy, Ecology would evaluate the data collected by Group Permit Applicants, and any available data collected by permittees under the Multi-Sector Permit. Based upon the extent of resources available for the task, Ecology would rank the groups, and proceed with further scrutiny of industries which would fall within the top ranked groups.

Again, the scrutiny would be additional monitoring requirements through amendment of the baseline general permit, or by assignment of individual permits. Note that the State of Washington has chosen not to implement the Multi-Sector Permit option offered by U.S.E.P.A.

Strategy #3:

Under this strategy, Ecology would establish effluent quality targets or goals. The targets would be established similarly to the process described in **Part** require a basic monitoring program of all permittees. 2)Require Screening Monitoring of All Dischargers; Compare to Goals
A graphic of Ecology's proposed compliance strategy follows on the next page. It is a decision flow chart showing the steps for incrementally reducing the numbers of dischargers who will have to perform detailed monitoring to verify their status of compliance with standards. The premise of the multistep strategy is that encouraging dischargers to voluntarily improve their SWPPP can save them money, accrue increased environmental benefits, and reduce Ecology's regulatory burden.

Dischargers save money by avoiding substantial monitoring requirements. Whenever dischargers choose the option of improving their SWPPPs to avoid monitoring costs, the discharge of pollutants likely is reduced. Whenever dischargers fall off the "high potential" list, Ecology has less facilities to take to the next step in the strategy. To implement each subsequent step of the strategy involves a higher cost of Ecology's resources (time and money) than the

previous step.

The steps of this strategy are:

Initial Screening Step:

Assessment #1:

Each permittee will receive a copy of the enclosed "Ranking Form for NPDES Industrial Stormwater Facilities." They will be instructed to complete the form and return it to Ecology. The permittees will also receive a letter explaining the entire stepwise process for identifying "high potential" facilties. Ecology will use the completed forms to rank all dischargers for their potential to violate water quality standards. Ecology may also use the form to identify dischargers who likely have SWPPPs which do not meet the intent of the technology-based requirements of the baseline general permit, regardless of their relative ranking.

After reviewing and amending the assessments based on personal knowledge of sites, Ecology will identify a manageable list of "high potential" dischargers for further action.

Notification #1:

Ecology will send a letter to all "high potential" dischargers. The letter will encourage them to improve their SWPPP by a set date.

Assessment #2:

At the end of the allotted time period, Ecology will send another Ranking Form to the "high potential" facilities for a re-evaluation. Ecology will review these forms and decide which facilities have sufficiently improved their SWPPPs such that they are no longer likely to violate water quality standards. Regulatory action will continue with the remaining facilities on the list.

Notification #2:

Ecology will notify those remaining facilities of their obligation to perform a screening assessment. The screening assessment will entail completion of a monitoring program which meets the requirements of USEPA's Form 2F for individual stormwater permit applications. This level of

monitoring should be sufficient to identify facilities who have low levels of pollution, and those who have sufficient levels that require further investigation.

Assessment #3:

Based on the results of the screening level monitoring, Ecology will decide which facilities still have a discharge which merits further action.

Notification #3:

Ecology will notify those dischargers still considered to have a "high potential" to violate standards. The notification will include a more detailed description and likely cost estimate of an intensive monitoring\modeling program which will likely resolve the question of compliance with standards. The general framework of requirements for those monitoring/modeling programs are explained in **Section II. Points of Compliance for Discharges to Surface Waters,** and in **Section III. Monitoring of Stormwater Discharges.**

The cost of such an intensive monitoring program will be quite substantial. The letter will give the discharger an option of improving their SWPPP, documenting that to Ecology, and reperforming the screening level monitoring. The purpose of the screening monitoring is to serve as an indicator of a reduction in pollutants discharged. Dischargers will be given a deadline by which to choose this option.

If the discharger does not choose to improve their SWPPP, they will be required to perform the intensive monitoring/modeling program.

Assessment #4:

Ecology will review the modified SWPPP's and monitoring results of those who choose that option. Based upon that review, Ecology will judge whether each facility is likely in compliance with water quality standards. If the decision is that a facility is not, Ecology will pursue additional regulatory measures through formal enforcement options (e.g., enforcement orders).

Ecology will also review the results of intensive monitoring and modeling. Based on that review, Ecology will judge whether a facility is likely in compliance with water quality standards. If the decision is that a facility is

not in compliance, Ecology will pursue additional regulatory measures through formal enforcement options.

If mixing zones for the design storm event are not eligible to receive a mixing zone exceeding the numeric size criteria or the overlap criteria. I recommend the following changes to make the WAC more understandable:

1) delete subsection 10(b)

2) 10(c) becomes 10(b) and is rewritten as follows:

> All mixing zones for storm water discharges not described by (a) of this subsection shall be based on a volumetric flow rate of runoff corresponding to a design storm approved by the department. Exceedences from the numeric size criteria in subsections (7) and (8) of this section and the overlap criteria in subsection (9) of this section due to precipitation events greater than the approved design storm may be allowed, provided the discharger clearly demonstrates to the department's satisfaction that:
>
> (i) All appropriate best management practices....
>
> (ii) The proposed mixing zone shall not have a ...
>
> (iii) The proposed mixing zone shall not create a...

Points of Compliance for Stormwater Discharges to Groundwaters

Introduction and Problem Statement:

The discharge of stormwater to the ground is a longstanding management option. Adoption of ground water quality standards (Chapter 173-200 WAC) for Washington state in 1990 raised questions concerning the advisability of continuing this practice and how to determine whether a stormwater discharge was complying with the standards.

Discussion:

Since the adoption of the ground water standards, Ecology has developed a Stormwater Management Manual for the Puget Sound Basin, published in February, 1992. The manual provides specific guidance concerning proper application of various BMP's to minimize adverse impacts of stormwater on the quality of ground waters. Use of proper soil types and pretreatment are key aspects of the guidance. However, adherence to designs and procedures cited in the manual do not guarantee compliance with ground water quality standards.

The situation is analogous to the discharge of storm water to surface waters. Even though technology-based BMPs are applied, the discharge may result in a violation the standards established for the receiving water, whether those waters be surface or ground waters.

Up until recently, there had not been guidance concerning how to determine if a discharge was causing a violation of ground water standards.

In regulating stormwater discharges to the ground, Ecology is proposing to take the same regulatory approach it is taking in regard to surface waters. The

JUN 8 DRAFT SWMP TO ~~ECOLOGY~~ PORT

JUN 11 ECOLOGY MEETING (WATER MTG)

JUN 14 TRY FOR ECOLOGY MZ MEETING