

SUPPORTING DOCUMENT FOR NPDES POLLUTANT  
MONITORING FREQUENCY DETERMINATION

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## INTRODUCTION

This support document supplements IAC 567 - Chapter 63 Monitoring, Analytical and Reporting Requirements. The subject discussed in this document is monitoring frequencies in wastewater permits.

All National Pollutant Discharge Elimination System permits require monitoring of regulated pollutants. The frequency of monitoring is determined using the three tables in IAC 567 Chapter 63; Table I - "Minimum Self-Monitoring in Permits for Organic Waste Discharges Controlled Discharge Wastewater Treatment Plants", Table II - "Minimum Self-Monitoring in Permits for Organic Waste Discharges Continuous Discharge Wastewater Treatment Plants", and Table III - "Operational Monitoring Requirements in Permits".

In addition, IAC 567 – 63.3(2) requires "Self-monitoring requirements to be incorporated in the operation permit for the discharge of a pollutant not addressed in Tables I, II and III shall be determined on a case-by-case evaluation of the potential impact of the discharge on the receiving stream, potential for toxic or deleterious effects of the discharge, complexity of the treatment process, variability in waste stream pollutant concentrations, or any other factor which requires strict control to meet the effluent limitations of the permit." The following support document describes the method by which the above rule will be implemented.

## MONITORING FREQUENCY DETERMINATION FOR DIRECT DISCHARGERS

The following stepwise process will be used to determine the monitoring frequency for individual pollutants covered by IAC 567 – 63.3(2). The permit writer is responsible for determining the pollutant group category for each pollutant to be monitored, the frequency at which each pollutant will be discharged at a concentration equal to or greater than fifty (50) percent of the proposed limit and the percentage of effluent flow to stream flow. This information will be used to determine the monitoring frequency category.

**A. Pollutant Groups:** Appendix A lists pollutants by group based on the Water Quality Standard (WQS) in IAC 567-61 Table 1 Chemical Criteria. Pollutant groups were based on the Warm water Type I (B(WW-1)) WQS. In the absence of a B(WW-1) standard the Human Health (HH) WQS or Drinking Water (C) WQS was used for the purpose of pollutant groups. The following table shows the definition of each pollutant group based on the WQS in micrograms per liter.

Pollutant Group	Water Quality Standard in µg/L
1	≥ 1000
2	200 - 999
3	50 - 199
4	11 - 49
5	≤10

Each Group has a corresponding number. This number relates to the first row of the monitoring frequency flow chart found in Appendix C. In the absence of a Water Quality Standard a pollutant will be assigned to a group based on the toxicity of the pollutant (see “Pollutants Not Listed in Appendix A” below).

**B. Potential:** Potential is defined as the frequency at which the pollutant has been or could be discharged at a concentration that is equal to or greater than fifty (50) percent of the proposed maximum concentration limit. The following equation will be used to determine this frequency:

$$\frac{D}{N} \cdot 100 = F$$

Where: N = Total number of monitoring data points from the previous five years  
 D = number of data points that are equal to or above 0.50 times the proposed limit from the WLA<sup>1,2</sup> (mass or concentration)  
 F = Frequency at which the pollutant has been or can be expected to be discharged at greater than fifty percent of the proposed limit

<sup>1</sup> To determine potential for industrial contributors D = number of monitoring data points from the industrial contributor, that are equal to or above 0.50 times the proposed concentration limit from the treatment agreement.

<sup>2</sup> For data that has been reported as “no detection”, the detection level will be used.

For the determination of potential where less than ten (10) data points are available for analysis, the potential category will automatically be category five (5). After the permittee has submitted more than ten sample results, the permit may be reopened to reduce monitoring based on the procedure outlined in this document.

The calculated frequency will be used to determine the potential category in Appendix B. Each category has a corresponding number 1 to 5. This number relates to the second row of the monitoring frequency flow chart in Appendix C.

**C. Effluent Flow v. Stream Flow:** The average effluent flow versus stream flow will be compared on a percentage basis. Specifically, the comparison will be made between the proposed or actual average effluent flow to the 1Q10 stream flow which will be determined by using the following equation:

$$\frac{\text{Average Effluent Flow}^3}{1\text{Q10 Flow}} \cdot 100 = \% \text{ of Effluent Flow to Stream Flow}$$

<sup>3</sup> The conversion factor for million gallons per day to cubic feet per second is 1.55

The permit writer will use the average design flow (AWW Flow) as specified in the construction permit, as the average effluent flow. If the construction permit does not specify an AWW flow, the permit writer will use the highest reported 30 day average effluent flow from the past five years as the average effluent flow. In the case of new dischargers, where the construction permit does not specify an AWW flow, the permit writer will use the reported average wet weather flow from the permit application.

The result of the above equation will be the percentage of effluent flow to stream flow. This percentage will be used to determine the category to be applied in Appendix B. This number will be used in the third row of the monitoring frequency flow charts in Appendix C.

**D. Monitoring Frequency Conclusion:** After the permit writer has followed the above steps and applied the corresponding categories to the monitoring frequency flow charts, the result will be a roman numeral of I – IV. This roman numeral corresponds to the monitoring frequency flow chart listed in Appendix C. Determination of specific frequency will be left to the permit writer’s discretion and any circumstances not accounted for in the previous steps.

### MONITORING FREQUENCY DETERMINATION FOR INDUSTRIAL CONTRIBUTORS

Monitoring frequencies for industrial contributors to POTW’s will be based on the above described determination model with the exception of effluent flow v. stream flow. The permit writer will use the reasonable potential analysis to compare the TA limits from all industrial contributors to the WLA limit. The percentage of the TA limit compared to the WLA limit can be found in the reasonable potential analysis column labeled “Percent WLA” times 100. The percentage found will be used to determine the category to be applied in Appendix B in place of effluent flow v. stream flow. Each category has a corresponding number 1 to 4. This number will be used in the third row of the monitoring frequency flow chart in Appendix C.

## POLLUTANTS NOT LISTED IN APPENDIX A

The pollutants not already placed into groups will be evaluated on a case-by-case basis to determine the toxicity of the pollutant. The EPA ECOTOX website will be used to gather information about pollutant toxicity. This data can be found at [www.epa.gov/ecotox/](http://www.epa.gov/ecotox/) using the aquatic toxicity search feature.

Pollutant Group	½ of the LC50 or the NOEC <sup>4</sup> in µg/L
1	≥ 1000
2	200 – 999
3	50 – 199
4	11 – 49
5	≤10

<sup>4</sup> In cases where both the LC50 and NOEC are available, the NOEC will be used to determine the pollutant group.

## PHYSIO-CHEMICAL POLLUTANTS AND NON-POLLUTANT PARAMETERS

In cases where the monitoring of physio-chemical parameters, such as pH, temperature or flow, is to be included in the NPDES permit, the permit writer will require monitoring at a frequency that is at least as frequent as the most frequently monitored pollutant, but no less than once per month. Monitoring for these parameters may be more frequent depending on any other extraneous factors that would require strict control.

## Appendix A - Pollutant Groups

### Group 1

Nitrite as N  
 Barium  
 Ethylbenzene  
 Flouride  
 Nitrate as N  
 Nitrate + Nitrite and N  
 Chlorobenzene  
 Chloride  
 \*Total Dissolved Solids  
 \*Total Suspended Solids  
 \*Oil and Grease  
 Iron

### Group 2

Hexachlorocyclopentadiene  
 Aluminum  
 para-Dichlorobenzene  
 Di(2-ethylhexyl)adipate  
 Zinc  
 Picloram  
 o-Dichlorobenzene  
 Nickel  
 trans-1,2-Dichlorethylene  
 Glyphosphate

### Group 3

Phenols  
 Toluene  
 Chloroform  
 cis-1,2-Dichloroethylene  
 1,2,4-Trichlorobenzene  
 Trichloroethylene (TCE)  
 Trihalomethanes  
 2,4-D  
 Endothall  
 Methoxychlor  
 Styrene  
 Dalapon  
 1,1,1-Trichloroethane

### Group 4

Benzene  
 Antimony  
 Cadmium  
 Di(2-ethylhexyl)phthalate  
 Diquat  
 Total Residual Chlorine  
 Vinyl Chloride  
 Lead  
 Silver  
 Copper  
 Carbofuran  
 Chromium  
 Bromoform

### Group 5

4,4-DDT++  
 Heptachlor epoxide  
 Heptachlor  
 Chlordane  
 Hexachlorobenzene  
 Parathion  
 Polychlorinated Biphenyls (PCB's)  
 Polynuclear Aromatic Hydrocarbons (PAH's)  
 Chloropyrifos  
 Ethylene dibromide  
 Dieldrin  
 Endosulfan  
 Dibromochloropropane  
 3,3-Dichlorobenzidine  
 Oxamyl (Vydate)  
 Endrin  
 Toxaphene  
 Benzo(a)Pyrene  
 1,1-Dichloroethylene  
 y-Hexachlorocyclohexane (Lindane)  
 Dichlorobromomethane  
 1,1,2-Trichloroethane  
 Asbestos  
 2,3,7,8-TCDD (Dioxin)  
 Thallium  
 Alachor

### Group 5 Cont.

2,3,7,8-TCDD (Dioxin)  
 Thallium  
 Alachor  
 Mercury  
 Carbon Tetrachloride  
 Atrazine  
 1,2-Dichloroethane  
 Beryllium  
 Simazine  
 Chlorodibromomethane  
 Dichloromethane  
 1,2-Dichloropropane  
 Dinoseb  
 Tetrachloroethylene  
 Cyanide  
 Selenium  
 2,4,5-TP (Silvex)  
 \*Xylenes  
 Pentachlorophenol (PCP)  
 \*\*Arsenic  
 Mercury  
 Carbon Tetrachloride

\*\*Based on the current numeric WQS this pollutant would be placed in Group 3

\*Pollutants that do not have a WQS

## Appendix B - Likelihood and Effluent Flow v. Stream Flow Categories

### Potential

Potential	Category
< 5 %	1
6 - 10 %	2
11 - 20 %	3
21 - 50 %	4
> 50 %	5

### Effluent Flow v. Stream Flow

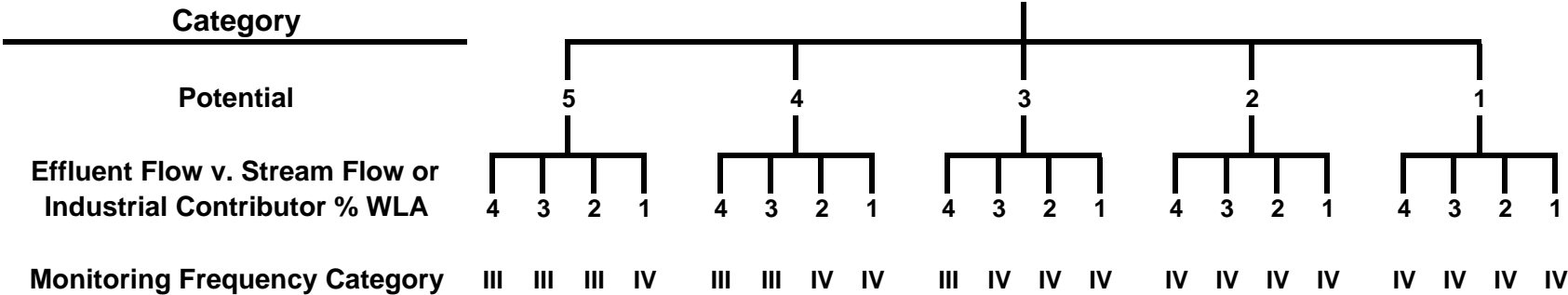
Effluent Flow v. 1Q10 Stream Flow	Category
<10% of 1Q10	1
10-25% of 1Q10	2
25-50% of 1Q10	3
>50% of 1Q10	4

### Industrial Contributor % WLA

% WLA	Category
<10%	1
10-25%	2
25-50%	3
>50%	4

### Appendix C - Monitoring Frequency Flow Charts

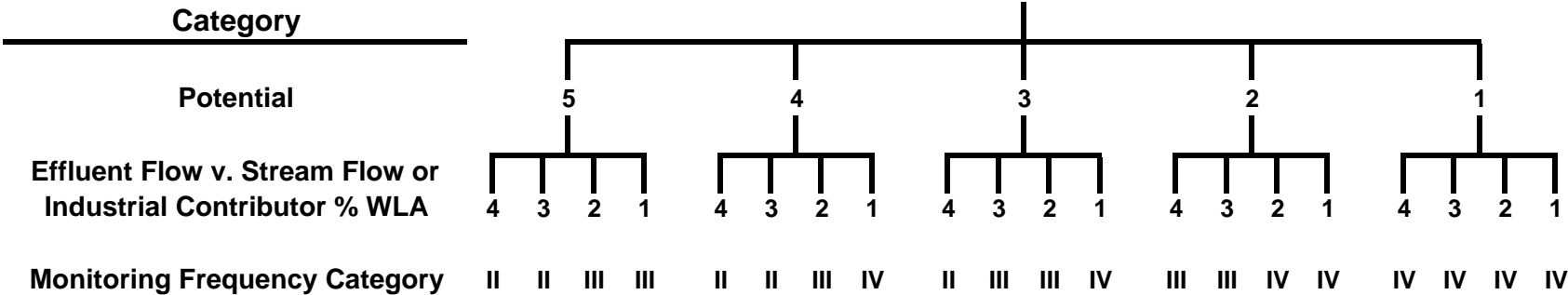
#### Pollutant Group 1



Monitoring Frequency	Monitoring Frequency Category
Greater than Biweekly	I
Biweekly - Weekly	II
Bimonthly - Monthly	III
Quarterly or Biannually	IV

### Appendix C - Monitoring Frequency Flow Charts

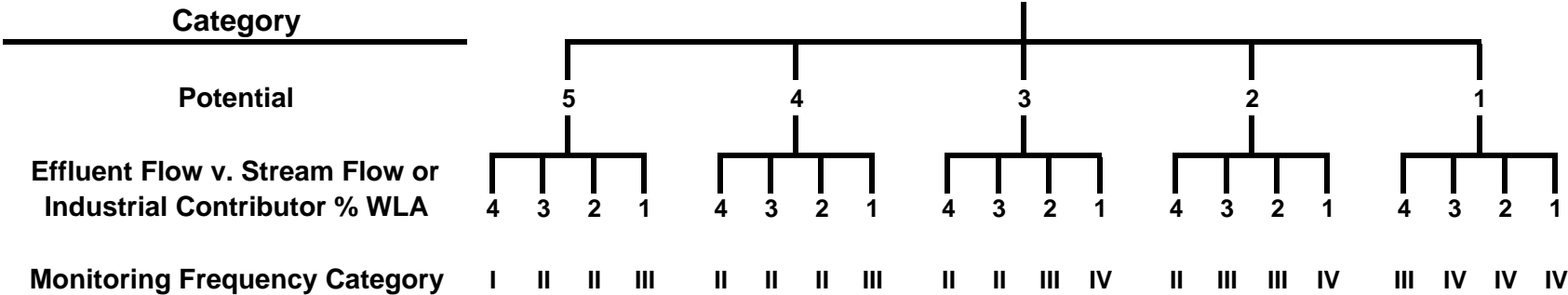
#### Pollutant Group 2



Monitoring Frequency	Monitoring Frequency Category
Greater than Biweekly	I
Biweekly - Weekly	II
Bimonthly - Monthly	III
Quarterly or Biannually	IV

### Appendix C - Monitoring Frequency Flow Charts

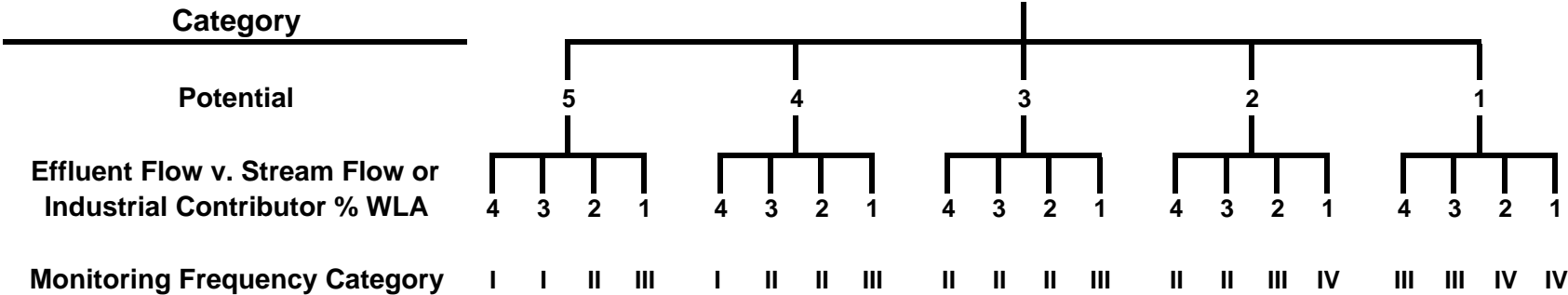
#### Pollutant Group 3



<u>Monitoring Frequency</u>	<u>Monitoring Frequency Category</u>
Greater than Biweekly	I
Biweekly - Weekly	II
Bimonthly - Monthly	III
Quarterly or Biannually	IV

### Appendix C - Monitoring Frequency Flow Charts

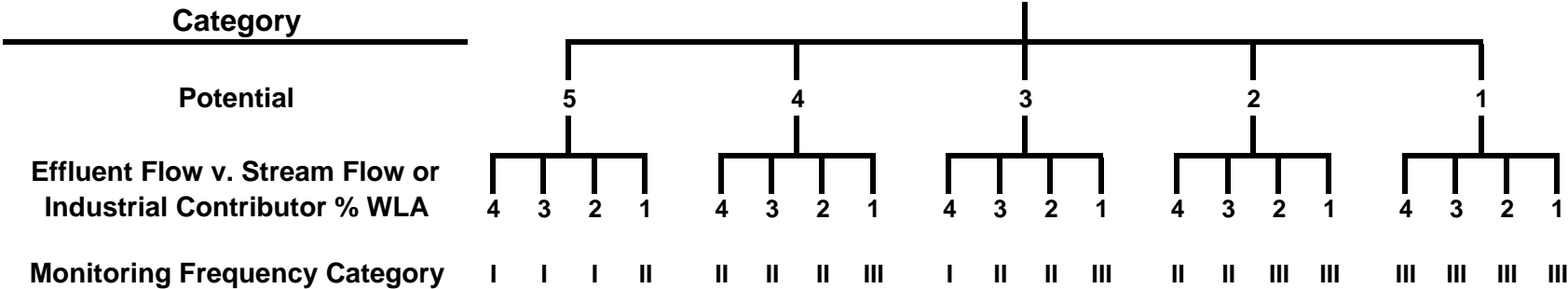
#### Pollutant Group 4



<u>Monitoring Frequency</u>	<u>Monitoring Frequency Category</u>
Greater than Biweekly	I
Biweekly - Weekly	II
Bimonthly - Monthly	III
Quarterly or Biannually	IV

### Appendix C - Monitoring Frequency Flow Charts

#### Pollutant Group 5



Monitoring Frequency	Monitoring Frequency Category
Greater than Biweekly	I
Biweekly - Weekly	II
Bimonthly - Monthly	III
Quarterly or Biannually	IV