

GUIDELINES FOR PREPARATION OF
CAPACITY ANALYSIS REPORTS

Florida Department of Environmental Regulation

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PURPOSE AND APPLICABILITY

Purpose

The purpose of this document is to provide guidelines for the preparation of Capacity Analysis Reports. The following aspects of capacity analysis report preparation are included:

1. Required dates for submittal of initial and updated reports,
2. Report outline, and
3. Minimum schedule for planning, design, and construction.

Applicability

These guidelines are to be used in the preparation of capacity analysis reports by permittees of domestic wastewater treatment facilities and by professional engineers assisting in report preparation. The section of this report entitled "Dates for Submittal" outlines when initial capacity analysis reports and updates to capacity analysis reports must be submitted to the Department.

BACKGROUND

Since Congress passed the Clean Water Act in 1972, more than \$73 billion have been invested in the nation's wastewater infrastructure. In an effort to prevent these facilities from deteriorating, the Environmental Protection Agency (EPA) asked states to develop and promote state-based municipal water pollution prevention (MWPP) programs. These programs would be aimed at preventing pollution rather than taking corrective action after pollution has occurred.

The EPA guidance on MWPP programs identified two concepts which, if incorporated into the Department's domestic wastewater facilities rules, would help improve compliance and facilitate program management:

1. Establishment of a mechanism for assessing operations and physical capabilities of wastewater treatment facilities on a regular basis, and
2. Implementation of necessary preventative measures, including the planning, design, and construction of new or expanded facilities.

In 1990, when Chapter 17-600, Florida Administrative Code (F.A.C.), was being modified, these two key pollution prevention concepts were incorporated in the rule.

Rule Requirements

Rule 17-600.405, F.A.C., Planning for Wastewater Facilities Expansion, was added to ensure that permittees conduct the timely planning, design, and construction of wastewater facilities necessary to provide proper treatment and reuse or disposal of domestic wastewater and management of domestic wastewater residuals.

The rule requires permittees to routinely compare flows being treated at wastewater facilities with the permitted capacities of the treatment, residuals, reuse, and disposal facilities. When the three-month average daily flow exceeds 50 percent of the permitted capacity of the treatment plant or reuse and disposal systems, the permittee shall submit an initial capacity analysis report to the Department's appropriate district office. Based on the results of this initial report, the permittee will be required to submit updated capacity analysis reports to the Department and, possibly, initiate planning, design, and construction of new facilities.

Definitions

"Annual Average Daily Flow," "Design Capacity," "Domestic Wastewater," "Monthly Average Daily Flow," "Permitted Capacity," "Three-month Average Daily Flow," "Type I Facility," "Type II Facility," and "Type III Facility" are defined as follows:

Annual Average Daily Flow - means the total volume of wastewater flowing into a wastewater facility during any consecutive 365 days, divided by 365 and expressed in units of mgd.

Design Capacity - means the average daily flow projected for the design year which serves as the basis for the sizing and design of the wastewater facilities. The design capacity is established by the permit applicant. The time frame associated with the design capacity (e.g., annual average daily flow, maximum monthly average daily flow, three-month average daily flow) shall be specified by the permit applicant.

Domestic Wastewater - means wastewater derived principally from dwellings, business buildings, institutions, and the like; sanitary wastewater; and sewage. Where wastewater from sources other than typical domestic sources (e.g., industrial sources) is combined and treated with wastes from domestic sources, the determination of whether or not the wastewater treatment plant is designated as "domestic" shall be made by the Department considering any or all of the following: wastewater residuals classification; whether wastewaters have been pretreated or contain constituents within 50-150 percent, by concentration, of typical domestic wastewater; and whether the permittee, when not required to provide more stringent or otherwise specific levels of treatment, can provide assurance of facility compliance with domestic wastewater treatment standards contained in Chapter 17-600, F.A.C.

Monthly Average Daily Flow - means the total volume of wastewater flowing into a wastewater facility during a calendar month, divided by the number of days in that month and expressed in units of mgd.

Permitted Capacity - means the treatment capacity for which a plant is approved by Department permit expressed in units of mgd. The permit shall specify the time

frame associated with the permitted capacity (e.g., annual average daily flow, maximum monthly average daily flow, three-month average daily flow).

Three-month Average Daily Flow - means the total volume of wastewater flowing into a wastewater facility during a period of three consecutive months, divided by the number of days in this three-month period and expressed in units of mgd. The three-month average daily flow also can be calculated by adding the three monthly average daily flows observed during this three-month period and dividing by three. The three-month average daily flow is a rolling average that is to be assessed for each month of the year.

Type I Facility - means a wastewater facility having a permitted capacity of 500,000 gallons per day or greater.

Type II Facility - means a wastewater facility having a permitted capacity of 100,000 and up to, but not including, 500,000 gallons per day.

Type III Facility - means a wastewater facility having a permitted capacity of over 2,000 and up to, but not including, 100,000 gallons per day.

DATES FOR SUBMITTAL

Initial Capacity Analysis Reports

Rule 17-600.405(4), F.A.C., describes when initial capacity analysis reports must be submitted to the Department. Figure 1 summarizes this rule requirement and may be used to determine when the initial report is due. The time frame associated with the permitted capacities may or may not be three-month average daily flows. Regardless, the three-month average daily flows should be compared with the permitted capacities to determine when the initial report is due.

If a separate reuse or disposal system permit is issued for a wastewater treatment plant, a single capacity analysis report should be submitted for the entire wastewater facilities. The initial report should be submitted in accordance with Figure 1 when the initial report for either the treatment plant or reuse and disposal system is due, whichever occurs first.

Updated Capacity Analysis Reports

Rule 17-600.405(5), F.A.C., describes when updated capacity analysis reports must be submitted to the Department. Figure 2 summarizes this rule requirement and may be used to determine when an updated report is due.

REPORT OUTLINE

Table 1 presents the outline to be used for preparing the capacity analysis report. The following sections discuss the contents of the report.

Title Page

The title page should include the following:

1. Type of report (initial or updated capacity analysis report),
2. Name of the facility,
3. County,
4. Facility's DER identification number, also known as Groundwater Monitoring System (GMS) identification number,
5. Current DER and NPDES (if applicable) permit number(s),
6. Current permit expiration date, and
7. Date of the report.

Certifications

Initial and updated capacity analysis reports shall be signed by the permittee and signed and sealed by a professional engineer registered in Florida. Certifications shall include:

The name, address, and phone number of the permittee, municipality, or county (include the name of a contact person) and a statement, signed by the permittee, that he "is fully aware and intends to comply with the recommendations and schedules included in the report;" and

The name, address, and phone number of the firm and/or professional engineer preparing the report and a statement, signed and sealed by the professional engineer preparing the report, that "the information contained in the report is true and correct to the best of his knowledge, the report was prepared in accordance with sound engineering principles, and he discussed the recommendations and schedules with the permittee or the permittee's delegated representative."

Unless otherwise approved by the Department in accordance with Rule 17-600.405(9), F.A.C., if the initial capacity analysis report or an update of the capacity analysis report documents that the permitted capacity will be equaled or exceeded within the next five years, the report shall also include:

A statement, signed and sealed by the professional engineer responsible for planning and preliminary design, that "planning and preliminary design of the necessary expansion have been initiated."

Unless otherwise approved by the Department in accordance with Rule 17-600.405(9), F.A.C., if the initial capacity analysis report or an update of the capacity analysis report documents that the permitted capacity will be equaled or exceeded within the next four years, the report shall include:

A statement, signed and sealed by the professional engineer responsible for preparation of plans and specifications, that "plans and specifications for the necessary expansion are being prepared."

Unless otherwise approved by the Department in accordance with Rule 17-600.405(9), F.A.C., if the initial capacity analysis report or an update of the capacity analysis report documents that the permitted capacity will be equaled or exceeded within the next three years, the report shall include:

A statement, signed by the permittee, that "a complete construction permit application will be submitted to the Department within 30 days of submittal of this capacity analysis report."

Unless otherwise approved by the Department in accordance with Rule 17-600.405(9), F.A.C., if the initial capacity analysis report or an update of the capacity analysis report documents that the permitted capacity will be equaled or exceeded within the next six months, the permittee shall submit to the Department an application for a construction/temporary operation/operation permit for the expanded facility, as appropriate. The operation permit application shall be submitted no later than the submittal of the initial capacity analysis report or the update of the capacity analysis report. The operation permit application shall include the certifications required by the application.

Table of Contents

The report should include a table of contents which follows the format of the report outline provided in Table 1. All pages should be numbered and cross referenced in the Table of Contents by page number.

Chapter 1 - Introduction

The introduction should include a brief description of the treatment, residuals, reuse, and disposal facilities. Up-to-date flow diagram(s) for these facilities should be attached to the report. Flow lines, tank volumes, and the name and quantity of each component, system, and process should be shown on the flow diagram(s). The flow diagram(s) should include each:

1. Pump station,
2. Major unit treatment process,
3. Residuals processing and disposal system, and
4. Reclaimed water reuse and effluent disposal system.

If the report is an updated report, the introduction should state when the last updated or initial capacity analysis report was submitted to the Department and the name of the engineer and the firm who prepared the report.

Chapter 2 - Existing Conditions

Permitted Capacities

The capacity analysis report shall clearly state the permitted capacities of the treatment plant (including the residuals treatment facilities) and the reuse or disposal system. The time frame associated with each permitted capacity (e.g., annual average daily flow, maximum monthly average daily flow, three-month average daily flow) should be stated.

Monthly Average Daily Flows, Three-month Average Daily Flows, and Annual Average Daily Flows

The rule states that the capacity analysis report must contain data showing the monthly average daily flows, three-month average daily flows, and annual average daily flows for the past 10 years or for the length of time the facility has been in operation, whichever is less.

Permittee's records of monthly operating reports should be used to obtain flow data. If these records are not available, the permittee may set up an appointment with the Department's appropriate district office to review Department files that contain monthly operating report data. The permittee may also request information from the Department's computer database for a small fee. A copy of this computer data may be obtained by mailing or FAXing a completed copy of the form letter, Attachment 1, to the Florida Department of Environmental Regulation. The capacity analysis report should provide information related to the accuracy of the flow data reported in the monthly operating reports. It should state whether flows were measured by a flow meter or other methods, the location of the flow meter, the last date of calibration of the meter, and who performed the calibration.

Monthly average daily flows, three-month average daily flows, and annual average daily flows should be calculated using monthly operating report data and the definitions provided in these guidelines. Monthly average daily flows and three-month average daily flows should be tabulated for each month of the year. Annual average daily flows should be tabulated for each year.

Type I and Type II plants should graph monthly average daily flows, three-month average daily flows, and annual average daily flows for at least the past 5 years. The monthly average daily flows, three-month average daily flows, and annual average daily flows to the treatment plant should be plotted on the same graph, using different legends to identify the respective flows. Type III facilities do not have to graph flows.

Seasonal Variations in Flow

For each of the past ten years, the month of the year when the three-month average daily flow was maximum and the ratio of the maximum three-month average daily flow to the annual average daily flow should be tabulated. The report should indicate whether the facility experiences seasonal variations in flow. It should identify the month(s) of the year when the three-month average daily flow was typically

maximum, and it should state the average ratio of the yearly maximum three-month average daily flow to the annual average daily flow for the past ten years.

Updated Flow and Loading Information

Rule 17-600.405(6), F.A.C., states "The report shall update the flow-related and loading information contained in the preliminary design report submitted as part of the most recent permit application for the wastewater facilities pursuant to Rules 17-600.710 and 17-600.715, F.A.C." To satisfy this rule requirement, the report should compare the loadings currently being treated at the plant to the loadings which were used to establish the design capacity.

For a treatment plant that received a construction permit after December 20, 1988, the design capacity was established in the preliminary design report based on predicted (design) loadings to the plant. For a plant permitted before this date, the design capacity may have been established in facility planning reports or other similar reports submitted to the Department during the permitting process. The Department used these reports to establish the permitted capacity for the facility, which in most cases should be equal to the design capacity.

The report should list the types of loadings (BOD₅/CBOD₅, TSS, total phosphorus, total nitrogen, etc.) used to establish the design capacity. The design and current loadings for each should be tabulated along with the method of calculation used to determine the current loadings (i.e., annual average, yearly maximum, etc.). The method used should be selected by the engineer. Current loadings should be based on the past year's influent monitoring data.

If all of the current loadings are within the ranges used to establish the design capacity, a simple statement of this fact should be included in the report. If the current loadings are not within the ranges, it should be stated, and recommendations and schedules for appropriate action should be included in Chapter 4 of this report.

Chapter 3 - Future Conditions

The capacity analysis report should project, for each of the next 10 years, the annual average daily flow and the maximum three-month average daily flow that will occur during each year. Population projections, in combination with water usage rates, wastewater flow records, or appropriate gallons per capita per day figures may be used to project the annual average daily flows. The average ratio of the yearly maximum three-month average daily flow to the annual average daily flow, as determined in the previous section on seasonal variations in flow, may then be used to project the maximum three-month average daily flows for each year.

Population Projections

Population projections for the service area should be tabulated on a yearly basis for each of the next 10 years. The report should discuss how these populations were projected and state what documents, such as comprehensive plans, census reports, and other facility planning documents, were used. It should discuss any

assumptions made, ratios used, or interpolations made. Equivalent dwelling units (EDUs) may be used to project population.

A map or sketch showing the existing service area and land uses should be included in the report. A map showing the 10-year projected service area and land uses should also be included.

Flow Projections

Annual average daily flows and yearly maximum three-month average daily flows should be tabulated for each of the next 10 years.

One way to project annual average daily flows and yearly maximum three-month average daily flows for residential areas is, first, to project the number of gallons per capita per day for the next 10 years. The report should discuss how this number was established (i.e., Was it based on water usage rates, wastewater flow records, or other appropriate gallons per capita per day figures?). Next, the projected number of gallons per capita per day should be multiplied by the yearly population projections to project annual average daily flows. Finally, the average ratio of the yearly maximum three-month average daily flow to the annual average daily flow, as determined in the previous section on seasonal variations in flow, should be multiplied by the projected annual average daily flow for each of the next 10 years to project the maximum three-month average daily flow for each year. Of course, if seasonal variations in flow have changed drastically over the last 10 year, the average ratio should be adjusted accordingly.

Annual average daily and maximum three-month average daily flow projections for commercial and industrial, or other non-residential users, and for outstanding commitments should be added to the residential flow projections.

Type I and Type II facilities should graph the projected annual average daily flows and yearly maximum three-month average daily flows for the next 10 years. The projected flows should be graphed so that they are a continuation of the actual annual average daily flows and the three-month average daily flows which have already been plotted for the past 5 years.

Chapter 4 - Summary and Conclusions

Time Required for the Three-month Average Daily Flow to Reach the Permitted Capacity

The dates that the maximum three-month average daily flows of the treatment plant or reuse and disposal systems are projected to exceed the permitted capacity should be stated in the capacity analysis report. When possible, these dates should be indicated on the graph of future conditions.

The time frame associated with the permitted capacities may or may not be three-month average daily flows. Regardless, the permitted capacities should be compared with the projected maximum three-month average daily flows for each year.

Recommendations for Expansion

If the yearly maximum three-month average daily flow will not equal or exceed the permitted capacity for the treatment plant or reuse or disposal systems within the next five years, recommendations for expansion do not have to be included in the report. A statement to this effect should be included.

If the maximum three-month average daily flow will exceed the permitted capacity within the next five years, recommendations shall be included.

Recommendations shall address the following:

1. Whether new construction will be required;
2. Whether the facility will be replaced by regional facilities, indicating the name of the regional facility that it will be connected to and the dates for connection; and
3. Whether a re-rating study will be conducted to request a revision of the permitted capacity.

Expansion Schedules

Expansion schedules should be included for the treatment plant and reuse and disposal systems if it has been documented that the yearly maximum three-month average daily flow will exceed the permitted capacity, within the next five years. At a minimum dates for planning, design, submittal of the construction permit application, start of construction, submittal of the operation permit application, and placing the new or expanded facilities into operation should be included in accordance with Rule 17-600.405, F.A.C.

ABBREVIATED REPORTS

The following section outlines when abbreviated capacity analysis reports may be submitted to the Department and what information should be submitted in such cases. The Department may request any information, beyond what is provided in this section, if such information is needed to provide assurance that the facility will have adequate capacity available.

Facilities Serving Areas That Are Built-out

Facilities serving areas that are built-out may submit abbreviated capacity analysis reports to the Department when operating history (including monthly operating report data, ground water monitoring data, the Department's latest inspection reports, and any other documented information) indicates that the facility is in full compliance with its effluent limitations.

Initial Abbreviated Reports - Initial abbreviated reports must be submitted to the Department in accordance with Figure 1. Abbreviated initial reports shall include:

1. The sections entitled Title Page; Introduction; Permitted Capacities; and Monthly Average Daily Flows, Three-Month Average Daily Flows, and Annual Average Daily Flows, as described in these guidelines;
2. Information demonstrating that the service area is built-out, including a map or sketch showing the service area and land uses, and, a statement that there are no plans to expand the service area;
3. A statement that the collection system receives only domestic wastewater;
4. The name, address, and phone number of the permittee, municipality, or county (include the name of a contact person) and, a statement, signed by the permittee, that he "is fully aware of the information contained in the report;" and
5. The name, address, and phone number of the firm and/or professional engineer preparing the report and a statement signed and sealed by the professional engineer preparing the report, that "the information contained in the report is true and correct to the best of his knowledge, and the report was prepared in accordance with sound engineering principles."

Updated Abbreviated Reports - Updated abbreviated reports must be submitted to the Department in accordance with Figure 2. Abbreviated updated reports shall include:

1. The date when the last updated or initial capacity analysis report was submitted to the Department and the name of the engineer and the firm who prepared the report;
2. The sections entitled Title Page; Permitted Capacities; and Monthly Average Daily Flows, Three-Month Average Daily Flows, and Annual Average Daily Flows, as described in these guidelines;
3. A statement that the service area has not been expanded and that there are no plans to expand the service area that was identified in the initial abbreviated report;
4. The name, address, and phone number of the permittee, municipality, or county (include the name of a contact person), and a statement, signed by the permittee, that he "is fully aware of the information contained in the report;" and
5. The name, address, and phone number of the firm and/or professional engineer preparing the report and a statement signed and sealed by the professional engineer preparing the report, that "the information contained in the report is true and correct to the best of his

knowledge, and the report was prepared in accordance with sound engineering principles."

Facilities That Will Be Connected To A Regional Facility

Facilities that will be connected to a regional facility within the next two years may submit abbreviated initial or updated capacity analysis reports. The abbreviated reports must be submitted in accordance with Figures 1 and 2 and shall include:

1. If the report is an updated report, the date when the last updated or initial capacity analysis report was submitted to the Department and the name of the engineer and the firm who prepared the report;
2. The sections entitled Title Page; Permitted Capacities; and Monthly Average Daily Flows, Three-Month Average Daily Flows, and Annual Average Daily Flows, as described in these guidelines;
4. A detailed schedule for the removal of the facility from service, along with documentation from the owner of the regional facility indicating concurrence with the plan to connect;
4. The signature, name, address, and phone number of the permittee, municipality, or county (include the name of a contact person); and
5. The name, address, and phone number of the firm and/or professional engineer preparing the report and a statement signed and sealed by the professional engineer preparing the report, that "the information contained in the report is true and correct to the best of his knowledge, and the report was prepared in accordance with sound engineering principles."

FIGURE 1

SCHEDULE FOR SUBMITTAL OF INITIAL CAPACITY ANALYSIS REPORTS

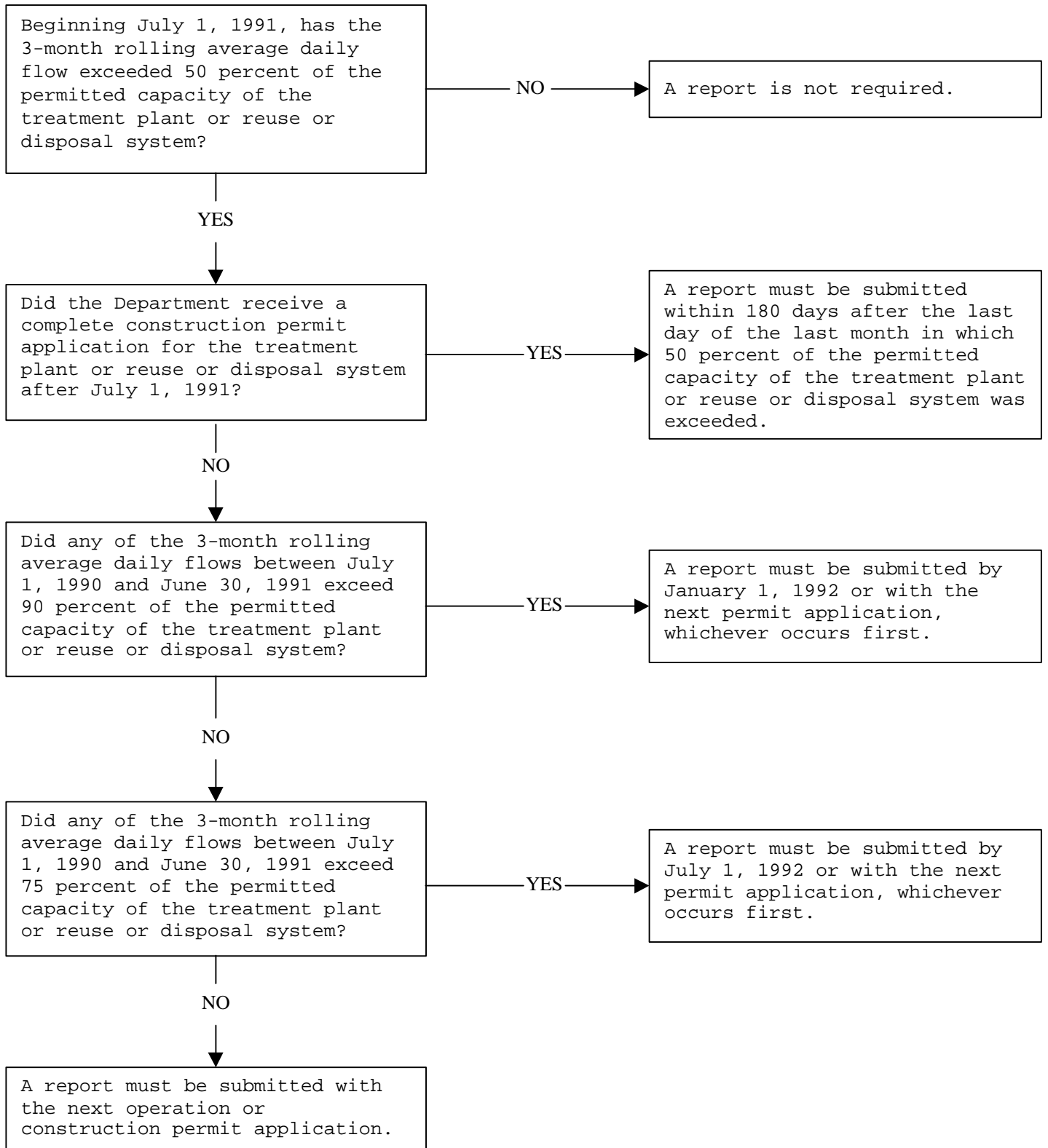


FIGURE 2

SCHEDULE FOR SUBMITTAL OF UPDATED CAPACITY ANALYSIS REPORTS

