Detailed Industry Questionnaire:
Phase II Cooling Water Intake Structures

Traditional Steam Electric Utilities

January 2000

U.S. Environmental Protection Agency
Office of Wastewater Management
Washington, DC

FORM APPROVED ❖ OMB CONTROL NO. 2040 - 0213 ❖ EXPIRATION DATE: 12/31/02

Notice of Estimated Burden

EPA estimates that completion of *Detailed Industry Questionnaire: Phase II Cooling Water Intake Structures* will require an average of 156 hours per facility. This estimate includes time for reading the instructions and reviewing the information necessary to respond to the questionnaire form. Any comments regarding EPA's need for the information, the accuracy of the provided burden estimate, and suggested methods for reducing respondent burden (including the use of automated collection techniques) should be addressed to: ***Director, Regulatory Information Division, Office of Policy, Planning, and Evaluation, Mail Code 2137, U.S. EPA, 401 M Street, SW, Washington, DC 20460.*** Please include the OMB Control Number, listed in the left-hand margin on this page, with any correspondence.

Certification Statement

Instructions

The individual responsible for directing or supervising the preparation of *Detailed Industry Questionnaire: Phase II Cooling Water Intake Structures* must read and sign the Certification Statement below before returning the completed documents to U.S. Environmental Protection Agency. The certifying official must be a responsible corporate official or his (or her) duly authorized representative. The Certification Statement must be completed and submitted in accordance with the requirements contained in the *Code of Federal Regulations* at 40 *CFR* 122.22.

> *I certify under penalty of law that the attached questionnaire was prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, accurate and complete. In those cases where we did not possess the requested information, we have provided best engineering estimates or judgments. We have, to the best of our ability, indicated what we believe to be company confidential business information as defined under 40 CFR Part 2, Subpart B. We understand that we may be required at a later time to justify our claim in detail with respect to each item claimed confidential. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment as explained in Section 308 of the Clean Water Act (33 U.S.C., Section 1318).*

Signature of Certifying Official	Date
Printed Name of Certifying Official	( ) Telephone No.
Title of Certifying Official	

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General Information and Instructions

Why This Questionnaire?

The U.S. Environmental Protection Agency (EPA) is currently developing regulations to be processed under Section 316(b) of the Clean Water Act, 33 U.S.C. Section 1326(b). Section 316(b) provides that any standard established pursuant to Sections 301 or 306 of the Clean Water Act (CWA) and applicable to a point source requires that the location, design, construction, and capacity of ***cooling water intake structures*** reflect the best technology available (BTA) for minimizing adverse ***environmental impact***.

Answers to the enclosed technical questionnaire will help EPA better understand the design and operation of cooling water intake structures at industrial facilities that are subject to Section 316(b).

Data from this detailed questionnaire are **not** intended to identify whether a specific facility's cooling water intake structures are having an adverse environmental impact. Moreover, questionnaire responses are **not** intended to identify whether a specific facility is employing BTA with respect to minimizing adverse environmental impacts from cooling water intake structures, though they may help EPA determine BTA options for various classes of facilities. The questionnaires are simply tools for characterizing some of the following: type and nature of facilities using cooling water, specific uses of ***cooling water***, design and configuration of cooling water systems and cooling water intake structures, types of technologies being used at ***intake structures***, and whether facilities have previously evaluated the environmental impacts of their cooling water intake structures. Data from the questionnaires will be factored into ongoing research being conducted by EPA that is more specifically designed to determine the nature of adverse impacts and the types of control technologies that might minimize such impacts. All of EPA's research efforts will feed the development of regulatory options, some of which will subsequently be fashioned into a proposed rulemaking that will be put forth for public review and comment.

Please note that it is not the intent of EPA to require facility personnel to go to unusual lengths to retrieve information to respond to this questionnaire. Responses should be based on data that can be accessed from plant records with reasonable diligence.

The enclosed plant-level questionnaire consists of three parts. Part 1 requests general ***plant*** information, such as plant name, location, operating status, ***Standard Industrial Classification (SIC) codes***, and ***National Pollutant Discharge Elimination System (NPDES) permit*** status. In addition, this part screens plants from the survey that may not use ***cooling water for contact or noncontact cooling*** purposes **or** are not directly withdrawing cooling water from ***surface water*** and, thus, are not subject to Section 316(b).

Part 2 requests plant-level technical data. Section A requests profile information on the plant's ***cooling water systems***, cooling water intake structures, ***cooling water discharge outfalls***, and the plant's water balance diagram. Section A first requests basic design and operational data for each of the plant's cooling water systems that are presently operating, ***temporarily offline***, or ***planned or under construction***. General profile data are then requested for the plant's intake structures that directly withdraw cooling water from surface water. The type of data requested for the cooling water structures includes the following:

plant-designated names and numbers, ***latitudes and longitudes***, total design intake flows, proportion of total flows used for cooling, and activities for which cooling water was used in 1998. Section A requests some very basic data on ***cooling water discharge outfalls***, such as plant-designated names or numbers and latitudes and longitudes at the point of each discharge outfall. The information from this section will be related to other data requested throughout the questionnaire to give EPA an understanding of the plant's general design and use of cooling water. Finally, a water balance diagram is requested to provide EPA with an understanding of how cooling water use and discharge practices relate to the plant's general water use practices. The diagrams will be used to analyze other data requested throughout the survey.

Section B requests information on the type of surface water sources being used by plants to provide cooling water. The configuration of the plant's ***intake structures*** is requested, such as whether ***intake canals/ channels*** are used, whether the intake structure incorporates a ***bay or cove***, and whether the intake structure is at the ***shoreline or offshore***. Depth of the water source at the withdrawal point is requested in addition to the average distance of the intake structure below the water surface. The section concludes by requesting information on whether sensitive aquatic ecological areas are within an area that is influenced by the plant's intake structures, if such information is known. The data from this section of the questionnaire will enable EPA to characterize the distribution of plants that have cooling water intake structures and the types of ***water bodies*** from which cooling water is being withdrawn.

Section C requests basic design and operating data about the technologies being used at cooling water intake structures. The questions are limited to those intake structures that directly withdraw cooling water from ***surface water***. Information is also solicited on the design pass-through velocity at each intake structure. Actual monthly cooling water intake flows are also requested for each intake structure for the years 1996 to 1998. In addition, plants are asked to provide some basic data if they have ever reduced cooling water intake flow rates to minimize ***impingement*** and/or ***entrainment*** and if they have employed dilution pump technologies to reduce the temperature of their discharge. For plants employing an ice control system at any of their cooling water intake structures, some basic information regarding the type of system(s) in place is requested. Some basic information on technologies that were previously used to minimize impingement and/or entrainment at an intake structure but were ineffective is requested. Finally, some very basic data on ***cooling water towers*** are requested for those plants that employ such devices.

Section D of the questionnaire requests information on the types of studies that may have been conducted at the plant. Basic data are requested for any Section 316(b) demonstration studies that may have been completed (i.e., studies to show that the location, design, construction, and capacity of a cooling water intake structure reflect BTA for minimizing adverse ***environmental impact***). Information is also requested on any discrete biological or technology-related studies that have been conducted by the plant on impingement and entrainment. Through this section of the questionnaire, EPA is attempting to identify research that plants have already undertaken on Section 316(b)-related topics and the availability of study data.

Section E requests some basic information for cooling water intake structures ***planned or under construction***. Basic design data are requested for these intake structures. This information will help EPA gain an understanding of the numbers of new intake structures expected to go on line in the future and their basic design and operating characteristics.

Part 3 of the survey asks for economic and financial information about plants and ***steam-electric generating units***. The EPA will use this information to assess the potential impacts of compliance with cooling water intake structure guidelines (under the authority of Section 316(b) of the Clean Water Act) on the economic viability of all affected plants and their steam-electric generating units.

Specifically, EPA needs to determine how many plants and ***generating units*** are likely to experience adverse economic impacts as a result of compliance with regulation, how large the economic impacts will be, and if these impacts will be more severe for plants and generating units owned by small firms than those owned by non-small firms. In order to evaluate the full economic impact of the regulation, EPA will consider the costs associated with performing Section 316(b) studies, additions to cooling water intake equipment, operating and maintenance costs associated with the regulation, and any impacts of Section 316(b) compliance requirements on the plant's economic efficiency. EPA will estimate compliance cost impacts on utility and plant cash flows and assess the likelihood of full or partial plant closures as a result of the regulation. EPA needs the information requested in this part of the survey in order to conduct these analyses.

The economic and financial portion of the questionnaire requests information about each plant as well as its steam-electric generating units. Frequently, your accountant or comptroller is the best source of this kind information. You may need to contact your utility headquarters for some of the information requested.

Authority

EPA is given authority to administer the technical questionnaire under Section 308 of the CWA (33 U.S.C. Section 1318). Late filing of the questionnaire, or failure to follow any related EPA instructions, may result in civil penalties, criminal fines, or other sanctions provided by law.

Who Must Complete This Questionnaire?

This questionnaire has been designed for completion by traditional ***steam electric utilities*** that are point sources as defined under Section 502 of the Clean Water Act (33 U.S.C. Section 1362).

Beyond this technical questionnaire, other editions have been produced for (1) steam electric nonutility power producers and (2) other manufacturers that use cooling water. The other manufacturers to receive a detailed questionnaire will include facilities from the following four major manufacturing sectors: Paper and Allied Products (SIC 26), Chemical and Allied Products (SIC 28), Petroleum and Coal Products (SIC 29), and Primary Metals (SIC 33). Each of these groups has been identified by EPA as using large quantities of cooling water and, therefore, potentially subject to Section 316(b) requirements.

Where to Get Help?

☎ **Toll-Free Help Line:** *Available weekdays, 9:00 a.m. to 5:00 p.m., Eastern Time*

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Parts 1 and 2: Scoping and Technical Data

Science Applications International Corporation (SAIC)
Toll-Free Phone No: 1-800-246-3113
Direct Dial Phone No: 1-703-318-4676 (long distance charges will apply)

Part 3: Financial and Economic Data

Abt Associates Inc.
Toll-Free Phone No: 1-888-295-6199
Direct Dial Phone No: 1-617-349-2496 (long distance charges will apply)

Certification Statement

A responsible corporate official or his (or her) duly authorized representative must verify the accuracy of the responses to the entire questionnaire package by reading and signing the enclosed Certification Statement. This statement must be returned to EPA along with completed survey materials.

When and How to Return the Questionnaire?

You must complete and return the Certification Statement to EPA within **90 calendar days** after receiving the materials at your plant or firm. Please return your materials in the enclosed self-addressed envelopes, to:

✉ **Detailed Industry Questionnaire: Phase II Cooling Water Intake Structures**
Traditional Steam Electric Utilities

316(b) Survey
U.S. Environmental Protection Agency
c/o SAIC (R-1-3)
11251 Roger Bacon Drive
Reston, VA 20190-5201

NOTE: *Please **keep a copy** of the completed questionnaire package and Certification Statement for your records.*

If you have extenuating circumstances that prevent you from meeting the 90 day deadline, please contact Deborah Nagle at the following address: **Survey.316b@epamail.epa.gov** to discuss your situation.

Once the surveys have been submitted, they will be entered into an EPA database and quality assurance reviews will be performed. During this time, your facility may be called by one of EPA's contractors to verify your data.

Confidential Business Information

You may assert a **business confidentiality claim** for *some* or *all* of your responses to the technical questionnaire, as described in 40 *CFR* 2.203(b) *(see full text below).* Complete regulations governing confidentiality of business information (CBI) appear in 40 *CFR*, Part 2, Subpart B.

> 40 *CFR* 2.203(b) *Method and time of asserting business confidentiality claim.* A business which is submitting information to EPA may assert a business confidentiality claim covering the information by placing on (or attaching to) the information, at the time it is submitted to EPA, a cover sheet, stamped or typed legend, or other suitable form of notice employing language such as 'trade secret,' 'proprietary,' or 'company confidential.' Allegedly confidential portions of otherwise nonconfidential documents should be clearly identified by the business, and may be submitted separately to facilitate identification and handling by EPA. If the business desires confidential treatment only until a certain date or until the occurrence of a certain event, the notice should so state.

▶ You may claim confidentiality of business information for any of your responses by checking (✓) the circle at the bottom of the page or by a method described above. Alternatively, all eligible questions in this questionnaire may be globally claimed confidential by checking the circle at the end of this paragraph. Note, however, that certain types of information cannot be claimed as confidential under the CWA (e.g., plant location, water body, water flow data, water body type). Questions that cannot be claimed as confidential do not include an individual check-off circle at the bottom of the page. If no check mark appears on this page or on the bottom of other pages **and** no other claim of confidentiality has been made with respect to any of your given responses, EPA may make the data available to the public without further notice. Please note that you may be required to justify any claim of confidentiality at a later time.

All **eligible** data are CBI ○

If EPA must reveal information covered by a claim of confidentiality, the Agency will strictly follow the requirements and procedures set forth in 40 *CFR* Part 2, Subpart B. Overall, EPA may reveal submitted information protected by a CBI claim **only** to other employees, officers, or authorized representatives of the United States who are responsible for implementation of the Clean Water Act. EPA has extensive standard operating procedures in place to handle, store, and transmit CBI data and has a long history of successfully managing this type of information. In addition, personnel expected to handle CBI data are required by the Agency to be trained and certified.

EPA may make information covered by a claim of confidentiality available Agency contractors so that work can be performed under their contracts. All EPA contracts require that contractor employees must use CBI data **only** to do work specified by EPA. The information will **not** be shown to anyone, other than EPA officials, without first having received written approval from the affected business or from EPA's legal office. If you have any comments on this matter, please include them with your completed questionnaire.

Specific Instructions for Completing the Questionnaire

Plant personnel most knowledgeable of the subject areas covered by the questions posed should complete the questionnaire. This may require that a different person be responsible for the completion of the technical portions (Parts 1 and 2) than the person who is responsible for the economic and financial portion (Part 3). Please provide an appropriate point of contact for each of these portions of the questionnaire. These persons may be contacted if there are questions on your responses.

Please answer the questions in sequence unless you are directed to SKIP forward in the questionnaire.

Do not leave response areas blank to any question that you have been directed to answer. For many questions, EPA has included a response box saying "Don't Know" or "No Data Available." If one of these response options is not included under a particular question, you *must* provide an answer.

> **NOTE:** *Matrices that contain separate response columns for individual cooling water intake structures need not be completed if the information being requested is not applicable to that particular cooling water intake structure.*

For quantitative data,

- **Please report to the nearest whole number, unless instructed otherwise.** If your answer is zero, please record a zero in the response column. Please do not leave a response area blank.
- **Provide actual data to the extent that they are available.** Good faith estimates should be provided *only* when actual data are *not* available.

Clearly mark responses to all questions with a black or blue ink pen, *or* type responses in the spaces provided.

For each question, **please read all instructions and definitions carefully.**

Most key terms are defined in the ***Glossary***, which accompanies the questionnaire package. Terms which are defined in the ***Glossary*** appear bold and italicized in the text. **Before responding to a given question, please read the definitions of any key terms used and any question-specific instructions.**

Please use the units specified when responding to questions requesting measurement data (e.g., gallons per day). When dates are requested, provide a 2-digit number that corresponds to the month. When years are requested, provide the complete year (e.g., 01/1999).

Please provide responses based on the time period(s) cited in each question. Note that the time period under which information is requested varies by question.

Please show whether information provided in any of your responses is confidential. Such information will be protected under EPA's confidentiality procedures. To claim a particular response as containing confidential business information, simply check (✓) the circle at the bottom of the page, if one is provided, or follow the other identification procedures described under 40 *CFR* 2.203(b).

> **NOTE:** *Please consult the Confidential Business Information subsection above for further information on asserting a CBI claim and for EPA disclosure requirements.*

Part 1: Scoping Data

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Part 1: Scoping Data

Survey IDN.
Name of Plant
Mailing Address
City, State ZIP

1. (a) Does the above mailing label reflect the plant's full legal name and address?

◯ **Yes** (1) ▶ **SKIP TO Q.2**

◯ **No** (2)

(b) Please provide the complete legal name and mailing address for the plant:

Name of Plant: _____ (1)

Street Address: _____ (2)

P.O. Box (if applicable): _____ (3)

City, State ZIP: _____ (4)

Telephone Number: _____ (5)

Part 1. Scoping Data

2. Please identify the person responsible for providing responses in the technical portion of this questionnaire. Provide the appropriate title and contact information:

NOTE: *The plant contact person provided here should be the person most knowledgeable about the information requested in this part of the survey. This person does not have to be the certifying official. Contact information for persons responsible for completing the economic portion will be requested in Part 3 of this questionnaire.*

Name: _____ (1)

Title: _____ (2)

Employer *(full legal name)*: _____ (3)

Relationship to Plant (e.g., employee, *domestic parent firm*, contractor, etc):
_____ (4)

Telephone No: ( ) _____ **Fax No:** ( ) _____ (5a & 5b)

Best Time to Contact: _____ (6)

3. Is the plant presently in commercial service?

NOTE: *To clarify for plants that are not in a commercial business, interpret this question as, "Is your plant currently operating?"*

◯ **Yes** (1)

◯ **No** (2) ▶ **STOP**

If answer is No, please stop here and return questionnaire with a completed Certification Statement.

4. What are the four-digit ***Standard Industrial Classification (SIC) codes*** associated with the plant's main lines of business?
[Please use SIC codes contained in the Office of Management and Budget's *1987 Standard Industrial Classification Manual*. This listing can also be found at the following Internet site: www.osha.gov/cgi-bin/sic/sicser5.]

NOTE: *Since the 1930s, SIC codes have been used to facilitate the collection, tabulation, presentation, and analysis of data relating to U.S. business establishments by Federal statistical agencies (e.g., Office of Management and Budget or OMB, Bureau of the Census, etc.). The system was last updated by OMB in 1987. It was recently replaced by the North American Industry Classification System (NAICS) in 1997; however, it continues to be used by many Federal agencies. EPA believes it would be unnecessarily confusing to ask facilities to classify themselves using NAICS codes for the purposes of this questionnaire.*

Primary __ __ __ __ (1)

Secondary __ __ __ __ (2)

Other __ __ __ __ (3a) __ __ __ (3b) __ __ __ (3c)

5. (a) Does the plant presently have or is the plant presently in the process of obtaining a ***National Pollutant Discharge Elimination System (NPDES) permit***?

◯ **Yes** (1)

◯ **No** (2) ▶ **STOP**

If answer is No, please stop here and return questionnaire with a completed Certification Statement.

NOTE: *Permits are required to be held under Section 402 of the Clean Water Act (33 U.S.C. 1342 et seq.) by any* ***point source*** *that discharges pollutants to* ***waters of the United States****. Permits may address such topics as effluent discharges, storm water, or sewage sludge management practices and may be issued by an EPA Region or a Federally-approved State NPDES program. Facilities that discharge 100 percent of their effluent (including storm water) to publicly-owned treatment works, privately-owned treatment works, and/or to ground water injection wells should answer "No" to this question.*

(b) Please indicate the NPDES permit number for the plant in the space provided: . . . . . _____

(c) In what year does the plant's current NPDES permit expire? _____

[❑ Please check here (✓) if your permit has expired but has been administratively extended.]

6. Since January 1, 1996, has ***cooling water*** been used for contact or non-contact cooling purposes at the plant? **[Please consider all cooling water used regardless of the type of water source or provider from which it was obtained.]**

◯ **Yes** (1)

◯ **No** (2) ▶ **STOP**

If answer is No, please stop here and return questionnaire with a completed Certification Statement.

DEFINITION

For the purposes of this questionnaire, the term **"cooling water"** refers to both contact and non-contact cooling water, including water used for air conditioning, equipment cooling, evaporative cooling tower makeup, and dilution of effluent heat content. The intended use of the cooling water is to absorb waste heat rejected from the process or processes employed or from auxiliary operations on the plant's premises.

7. Since January 1, 1996, has the plant directly obtained any portion of its cooling water from a ***surface water*** source? **[Note: In order for a plant to directly withdraw cooling water from surface water, it must have an *intake structure*. Please refer to the Glossary for the definition of surface water. If 100 percent of cooling water is withdrawn from a local water supplier, the plant's own groundwater supply, or the water supply of a facility other than your own, plant's should answer "No" to this question.]**

◯ **Yes** (1)

◯ **No** (2) ▶ **STOP**

If answer is No, please stop here and return questionnaire with a completed Certification Statement.

8. Please show in the matrix below all parties and/or sources from which the plant has obtained its cooling water, including the plant itself for a ***typical calendar year*** since 1996. **[Please check (✓) all applicable providers and/or sources.]**

For a typical calendar year, please estimate the proportion of the plant's total cooling water (from zero to 100 percent) obtained from each provider and/or source marked. The total of your proportions should be 100 percent.

▶ PLEASE REFER TO THE GLOSSARY ACCOMPANYING THIS QUESTIONNAIRE FOR DEFINITIONS OF THE DIFFERENT PROVIDERS AND/OR SOURCES.

Percent Contribution to Plant's Total Cooling Water Flow by Provider and/or Source for a Typical Year Since January 1, 1996

Item No.	Providers and/or Sources of Plant's Cooling Water Since January 1, 1996 [Please check (✓) all applicable providers and/or sources.]	Proportion (from zero to 100%) of Plant's Total Cooling Water Flow Obtained from Each Provider and/or Source for a Typical Calendar Year Since 1996
8(a)	***Surface Water***	_____ %(1)
8(b)	***Local Water Supplier*** (e.g., municipalities and river authorities)	_____ %(2)
8(c)	***Plant's Own Groundwater Supply***	_____ %(3)
8(d)	***Plant's Own Surface Water Supply***	_____ %(4)
8(e)	***Water Supply of Plant Other Than Own***	_____ %(5)
8(f)	***Other*** *(please describe below)*:	_____ %(6)
		100%

Part 2: Technical Data

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Section A: Plant Profile Data

Cooling Water Systems

1. Please provide the general profile data and design types requested in the matrix below for each of the plant's ***cooling water systems*** that are presently operating, or ***temporarily offline***. Do ***not*** include cooling water systems planned, under construction or permanently offline.

NOTES: *Please consider your plant as having only **one** cooling water system, **unless** your plant has systems that are physically separated (i.e., have separate water intake and outlet structures) and can be operated independently. If your plant has several intake structures, but only **one** outlet structure, or vice-versa, please consider the plant as having only **one** cooling water system. Intake structures with multiple bays count as one intake structure.*

*Information on structures **planned or under construction** is requested in Section E.*

DEFINITION For the purposes of this questionnaire, a **cooling water system** is a system that provides water to/from a plant to transfer heat from equipment or processes therein. A system includes, but is not limited to, one or more water intake and outlet structures, cooling towers, ponds, pumps, pipes, and canals/channels. For plants that use surface water for cooling, a cooling water system begins at the first barrier(s) to ingress and/or egress by fish and other aquatic wildlife (e.g., at the ***weir wall***, at the trash rack, etc.) and ends at the discharge outlet(s).

Part 2. Technical Data

Profile and Configuration of Plant's Cooling Water Systems (CWSs) Matrix ___ of ___

Response space has been provided for two CWSs. If your plant has more than this number of systems, please copy the matrix. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	CWS A	CWS B
1(a)	Plant-designated Number or Name of CWS		
1(b)	Month and Year CWS Began Operation or is Expected to Begin Operation (e.g., 01/1999)	_____ /_____ Mo. Year	_____ /_____ Mo. Year
1(c)	Operating Status of CWS **[Please check (✓) only one response box per system.]**	Operating . . . . . ○(1) Temporarily Offline . . . . . ○(2) Planned or Under Construction ○(3)	Operating . . . . . ○(1) Temporarily Offline . . . . . ○(2) Planned or Under Construction ○(3)
1(d)	Configuration of CWS **[Please check (✓) only one design type per system.]**	**Once Through CWSs** Once-Through Only . . . . . ○(1) Once-Through With Nonrecirculating ***Cooling Canals/Channels, Lakes, or Ponds*** . . . . . ○(2) Once-Through With Nonrecirculating Cooling Towers . . . . . ○(3) **Recirculating CWSs** Recirculating Only . . . . . ○(4) Recirculating With Canals/ Channels, or Ponds . . . . . ○(5) Recirculating With Towers . . . . . ○(6) **Other** *(please describe below):* . . . . . ○(7)	**Once Through CWSs** Once-Through Only . . . . . ○(1) Once-Through With Nonrecirculating ***Cooling Canals/Channels, Lakes, or Ponds*** . . . . . ○(2) Once-Through With Nonrecirculating Cooling Towers . . . . . ○(3) **Recirculating CWSs** Recirculating Only . . . . . ○(4) Recirculating With Canals/ Channels, or Ponds . . . . . ○(5) Recirculating With Towers . . . . . ○(6) **Other** *(please describe below):* . . . . . ○(7)

Cooling Water Intake Structures

2. How many ***intake structures*** does the plant have that directly withdraw surface water to support, at least in part, contact or noncontact ***cooling operations*** within the plant?

Consider ***only*** those intake structures presently operating and temporarily offline (i.e., expected to operate again in the future). Do ***not*** include intake structures planned or under construction or permanently offline. . . . . _____

DEFINITION For the purposes of this questionnaire, a ***cooling water intake structure*** is the total structure used to withdraw water from a water source up to the first intake pump or series of pumps. The intended use of the cooling water is to absorb waste heat rejected from processes employed or from auxiliary operations on the plant's premises. Single cooling water intake structures may have multiple intake bays and could serve more than one generating unit. If a plant has intake structures that withdraw water for purposes besides cooling, the entire intake structure should be considered a cooling water intake structure under the questionnaire.

▶ **PLEASE ANSWER THE REMAINING INTAKE-RELATED QUESTIONS IN THIS SECTION FOR *ONLY* THOSE INTAKE STRUCTURES RECORDED ABOVE UNDER Q.2.** *A later section in this questionnaire requests some very basic data on intake structures that are planned or under construction. No data are being requested on (a) intake structures that obtain cooling water via groundwater wells or (b) conduits to other providers of cooling water (e.g., local water suppliers or other plants).*

3. Please provide the general design data requested in the matrix below for each of the plant's cooling water intake structures.

Profiles of Plant's Cooling Water Intake Structures (CWISs) Matrix ___ of ___

Response space has been provided for two CWISs. If your plant has more than this number of intake structures, please copy the matrix. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	CWIS A	CWIS B
3(a)	Plant-designated Number or Name of CWIS		
3(b)	Number of ***Intake Bays*** on CWIS		
3(c)	Month and Year CWIS First Used (e.g., 01/1999)	_____ /_____ Mo. Year	_____ /_____ Mo. Year
3(d)	***Latitude*** at Point of Intake Structure Openings **(in degrees, minutes, and seconds)** **NOTE:** *For CWISs with intake bays, please provide latitude for the central point of the intake bay openings.*	_____° _____′ _____″	_____° _____′ _____″
3(e)	***Longitude*** at Point of Intake Structure Openings **(in degrees, minutes, and seconds)** **NOTE:** *For CWISs with intake bays, please provide longitude for the central point of the intake bay openings.*	_____° _____′ _____″	_____° _____′ _____″
3(f)	Associated Cooling Water System(s) **[Please insert CWS code numbers or names from Item 1(a) on page 2. If more than one CWS, please separate codes by a comma.]**	_____(1), _____(2), _____(3)	_____(1), _____(2), _____(3)
3(g)	Design Intake Capacity **(in GPD)** for CWIS **NOTE:** *If structure withdraws water for multiple purposes, please provide design intake flow for all uses.*	_____ GPD	_____ GPD
3(h)	Estimated Percentage of Design Capacity Apportioned to Cooling Water Flow for the past three (3) years (1996, 1997, and 1998) (based on annual average flows).	_____%	_____%

4. Please provide the activities requiring cooling water directly withdrawn from surface water and estimated total flow used in calendar year 1998 for each of the plant's cooling water intake structures.

① CWIS _____ [Please insert no. or name as in Question 3 in Section A] Matrix ___ of ___

Activities for Which Cooling Water Was Required in Calendar Year 1998 and Estimated Percent of Total Cooling Water Flow that Went to These Activities by Cooling Water Intake Structure

A separate matrix has been provided for two cooling water intake structures. If your plant has more than two cooling water intake structures, please copy the matrix and change the cooling water intake structure code names or numbers as appropriate. Please insert any additional matrices into this portion of the questionnaire and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item	Activity for Which Cooling Water is Used [Please Check (✓) All Activities That Apply]	Estimated Percent of Total Cooling Water Flow
4(a)	Electricity Generation Using Steam Turbines (including equipment cooling)	_____% of Flow Used(2)
4(b)	Electricity Generation Using Prime Movers Other Than Steam Turbines (including equipment cooling)	_____% of Flow Used(2)
4(c)	Air Conditioning (cooling and heating of indoor air)	_____% of Flow Used(2)
4(d)	Production Line (or Process) Contact and/or Noncontact Cooling (for use other than electricity generation and excluding air conditioning)	_____% of Flow Used(2)
4(e)	Other (please describe below)	_____% of Flow Used(2)

② CWIS _____ **[Please insert no. or name as in Question 3 in Section A]** Matrix ___ of ___

Activities for Which Cooling Water Was Required in Calendar Year 1998 and Estimated Percent of Total Cooling Water Flow that Went to These Activities by Cooling Water Intake Structure

A separate matrix has been provided for two cooling water intake structures. If your plant has more than two cooling water intake structures, please copy the matrix and change the cooling water intake structure code names or numbers as appropriate. Please insert any additional matrices into this portion of the questionnaire and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item	Activity for Which Cooling Water is Used [Please Check (✓) All Activities That Apply]	Estimated Percent of Total Cooling Water Flow
4(a)	Electricity Generation Using Steam Turbines (including equipment cooling)	_____% of Flow Used(2)
4(b)	Electricity Generation Using Prime Movers Other Than Steam Turbines (including equipment cooling)	_____% of Flow Used(2)
4(c)	Air Conditioning (cooling and heating of indoor air)	_____% of Flow Used(2)
4(d)	Production Line (or Process) Contact and/or Noncontact Cooling (for use other than electricity generation and excluding air conditioning)	_____% of Flow Used(2)
4(e)	Other (please describe below)	_____% of Flow Used(2)

Cooling Tower Technologies

5. (a) Does your plant employ ***cooling towers*** at any of its cooling water systems?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.6, Page 10**

(b) For each of the plant's cooling water systems (CWSs), please provide the cooling tower technology data requested in the matrices beginning on the next page.
[Refer back to the code names or numbers used for the plant's cooling water systems under Item 1(a) in Section A, page 2.]

Plants that currently employ more than one cooling tower technology on a given cooling water system should fill out a separate column for each **different tower**. If a given cooling water system has multiple cooling towers that are designed and/or operated **similarly**, only one column of the matrix needs to be completed. Please, however, report the total number of **similar** towers. If there are differences in the design or operation of cooling towers employed at a given cooling water system (e.g., different manufacturers, different ages, etc.), a separate column for each matrix should be completed.

① CWS _____ **[Please insert same no. or name as in Question 1 of Section A]** Matrix ___ of ___

Cooling Towers by Cooling Water System (CWS)

Response space has been provided for two cooling tower technologies per CWS. If one of your CWSs has more than this number of cooling tower technologies, please copy the matrix and continue noting your towers. However, please change the cooling tower technology numbers in the table heading to reflect the additional technologies (e.g., Cooling Tower Technology #3, Cooling Tower Technology #4, etc.). Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	Cooling Tower Technology #1	Cooling Tower Technology #2
5(b)(1)	Type of Cooling Tower Technology **[Please check (✓) only one response per technology column.]**	Mechanical Draft - Induced Draft . . ○(1) Natural Draft - Atmospheric . . . . . ○(2) Natural Draft - Chimney or Hyperbolic ○(3) Natural Draft - Fan Assist . . . . . ○(4)	Mechanical Draft - Induced Draft . . ○(1) Natural Draft - Atmospheric . . . . . ○(2) Natural Draft - Chimney or Hyperbolic ○(3) Natural Draft - Fan Assist . . . . . ○(4)
5(b)(2)	Manufacturer (Mfr.) Name and Model of System	Mfr: _____(1) Model: _____(2) Site-Specific Design . . . . . ○(3) Don't Know . . . . . ○(8)	Mfr: _____(1) Model: _____(2) Site-Specific Design . . . . . ○(3) Don't Know . . . . . ○(8)
5(b)(3)	Number of Cooling Towers of This Type with Same Design and Operational Description		
5(b)(4)	Calendar Year(s) Cooling Tower(s) Installed (e.g., 1995)		
5(b)(5)	Expected Life Span of Cooling Tower(s) **(in years)**	_____ (1) Don't Know. . . . . ○(8)	_____ (1) Don't Know. . . . . ○(8)

② **CWS** _____ **[Please insert same no. or name as designated in Question 1 of Section A.]** Matrix ___ of ___

Cooling Towers by Cooling Water System (CWS)

Response space has been provided for two cooling tower technologies per CWS. If one of your CWSs has more than this number of cooling tower technologies, please copy the matrix and continue noting your towers. However, please change the cooling tower technology numbers in the table heading to reflect the additional technologies (e.g., Cooling Tower Technology #3, Cooling Tower Technology #4, etc.). Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	Cooling Tower Technology #1	Cooling Tower Technology #2
5(b)(1)	Type of Cooling Tower Technology **[Please check (✓) only one response per technology column.]**	Mechanical Draft - Induced Draft . . ○(1) Natural Draft - Atmospheric . . . . . ○(2) Natural Draft - Chimney or Hyperbolic ○(3) Natural Draft - Fan Assist . . . . . ○(4)	Mechanical Draft - Induced Draft . . ○(1) Natural Draft - Atmospheric . . . . . ○(2) Natural Draft - Chimney or Hyperbolic ○(3) Natural Draft - Fan Assist . . . . . ○(4)
5(b)(2)	Manufacturer (Mfr.) Name and Model of System	Mfr: _____(1) Model: _____(2) Site-Specific Design . . . . . ○(3) Don't Know . . . . . ○(8)	Mfr: _____(1) Model: _____(2) Site-Specific Design . . . . . ○(3) Don't Know . . . . . ○(8)
5(b)(3)	Number of Cooling Towers of This Type with Same Design and Operational Description		
5(b)(4)	Calendar Year(s) Cooling Tower(s) Installed (e.g., 1995)		
5(b)(5)	Expected Life Span of Cooling Tower(s) **(in years)**	_____(1) Don't Know. . . . . ○(8)	_____(1) Don't Know. . . . . ○(8)

Cooling Water Discharge Outfalls

6. Is the plant presently a ***zero-discharge plant***? **[Base your determination of whether you are a zero-discharge plant on your effluent *only*. Do *not* include storm water discharges in this assessment.]**

◯ **Yes** (1) ▶ **SKIP TO Q.9, Page 11**

◯ **No** (2)

DEFINITIONS For the purposes of this questionnaire, a **zero-discharge plant** is a plant that does not return any treated or untreated plant effluent (excluding storm water) to surface water, a POTW, a privately-owned treatment works, or a groundwater injection well. An example of a zero-discharge plant might be an entity that discharges its total effluent to an evaporative pond or that completely recycles its wastewater.

7. How many NPDES-permitted ***cooling water discharge outfalls*** does the plant have? Consider only those discharge outfalls that are presently operating or temporarily offline (i.e., expected to return to service). Do ***not*** consider those discharge outfalls planned or under construction or permanently offline. . . . . _____

8. Please provide the general profile data requested in the matrix below for each of the plant's NPDES-permitted cooling water discharge outfalls.

Profiles of Plant's NPDES-Permitted Cooling Water Discharge Outfalls (CWDOs) Matrix ___ of ___

Response space has been provided for two CWDOs. If your plant has more than this number of outfalls, please copy the matrix and change the CWDO code numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	CWDO #1	CWDO #2
8(a)	NPDES Permit-designated Number or Name of Cooling Water Discharge Outfall		
8(b)	Latitude at Point of CWDO **(in degrees, minutes, and seconds)**	____ ° ____ ′ ____ ″	____ ° ____ ′ ____ ″
8(c)	Longitude at Point of CWDO **(in degrees, minutes, and seconds)**	____ ° ____ ′ ____ ″	____ ° ____ ′ ____ ″
8(d)	Associated Cooling Water System(s) **[Please insert CWS code numbers or names from Item 1(a) on page 2. If more than one CWS, please separate codes by a comma.]**	_____(1), _____(2), _____(3)	_____(1), _____(2), _____(3)

Flow Distribution/Water Balance Diagram

9. Please attach a flow distribution/water balance diagram to this section of the questionnaire. The flow diagram should contain the information itemized below.

NOTE: *If you have an existing diagram, perhaps as part of your NPDES permit application package, you may modify it to include the information requested. If you do not have a flow diagram, please develop one. The diagram can be printed or typed. A sample diagram has been included at the end of this section to clarify the type of information being requested.*

(a) Intake-Related Data (based on 1998 flow data)

(1) By intake structure (both cooling water intake structures as well as others), note contributing sources of ***new water*** to the plant by generic name (e.g., groundwater, surface water, local water supplier, or ***water supply of plant other than your own***) despite how that water is ultimately used.

- Include intake structures presently operating, and temporarily offline but expected to be returned to service.
- Do ***not*** include intake structures that have been permanently taken offline or those planned or under construction.
- Label the intake structures on the diagram with a plant-designated name or number, and note the operational status.
- Provide a brief description of the source water and intake configuration (e.g., the cooling water intake structure has 5 surface intake bays that are flush with the shoreline on a natural cove on the Survey River)

NOTE: *An annual average of flows in gallons per day (GPD) can be calculated by summing actual daily intake flows (in MGD) for 1998 and dividing by 365 days.*

(2) Indicate the average daily ***intake*** flow of new water, including ***makeup water***, in GPD taken into the plant through each of the plant's intake structures.

(b) Distribution of Plant's Intake Flow (based on 1998 flow data)

Indicate the distribution of intake flow (average daily intake flows, in GPD) from each of the intake structures to waters used for process, contact and noncontact cabling, and nonprocess activities within the plant.

- Note the type of activity (e.g., process, contact cooling, noncontact cooling, or nonprocess) and the flow to each (in GPD).
- Include recirculating and recycle loops where appropriate with associated flows.

(c) Discharge-Related Data (based on 1998 flow data)

(1) By discharge structure, indicate the water sources or entities that receive the plant's discharge by generic name (e.g., ***POTW, privately-owned treatment works***, cooling canals/channels, cooling lakes, cooling ponds, cooling towers, ***groundwater***, or ***surface water***).

- Include all discharge structures presently operating, and those temporarily offline but expected to be returned to service.
- Do ***not*** include discharge structures that are planned, under construction, or permanently offline.
- Please label the discharge structures on the diagram with a plant-designated name or number, and please note the operational status of each structure.

(2) Average daily intake flows, (in GPD) being discharged to each of these water sources.

▶ **See Next Page for Example of a Plant Flow Distribution/Water Balance Diagram.**

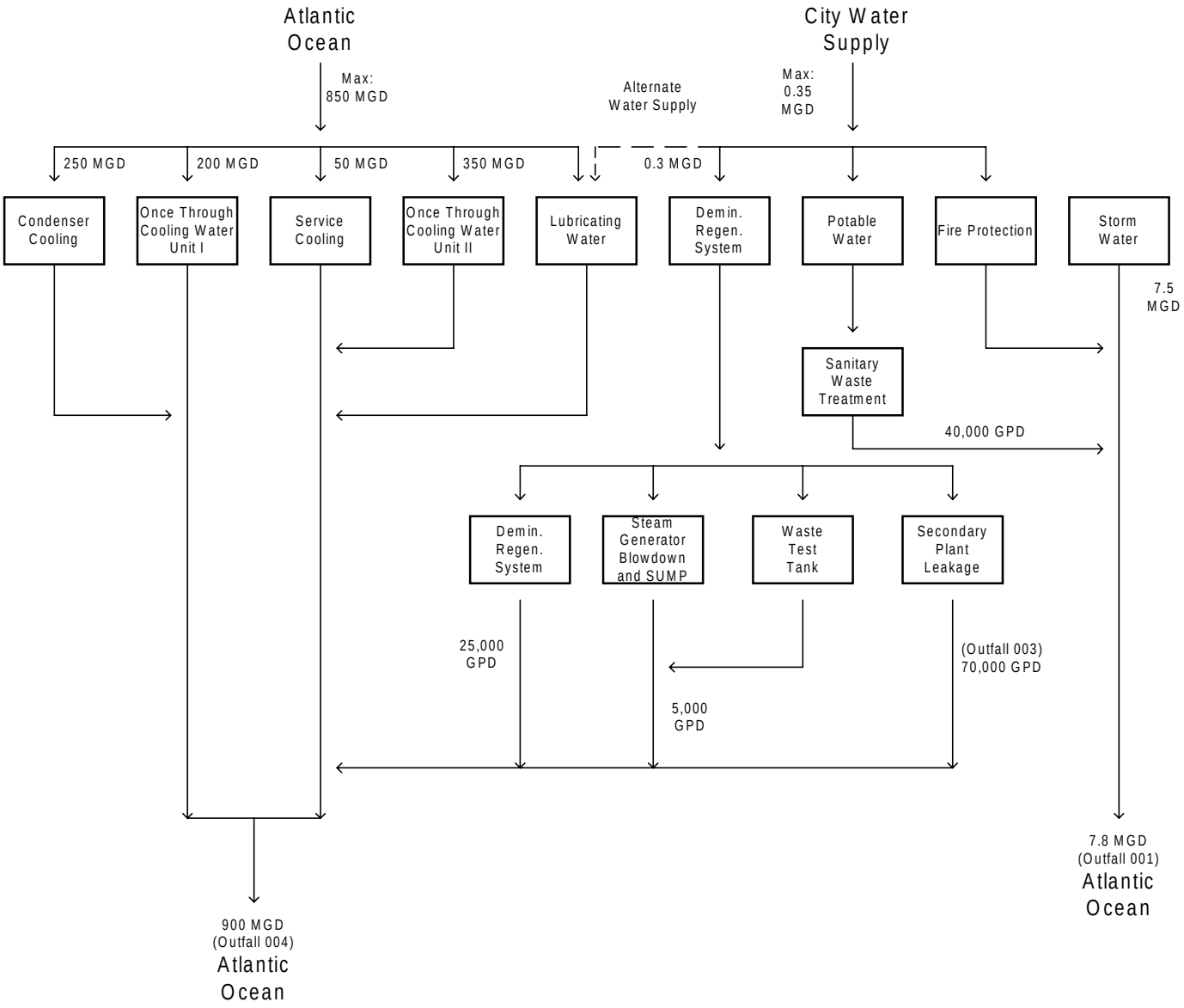
▶ **Please Insert Your Water Balance Diagram at the End of This Section of the Questionnaire and Indicate Below That It Is Attached.**

Diagram Attached?

◯ **Yes** (1)

◯ **No** (2)

Example Flow Distribution/Water Balance Diagram



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Section B: Sources of Cooling Water and Intake Arrangements

▶ Please answer the questions in this section of the questionnaire for ***only*** those cooling water intake structures that directly withdraw surface water to support contact and noncontact cooling operations within the plant. Consider ***only*** those cooling water intake structures presently operating and those temporarily offline but expected to be returned to service. Do ***not*** include intake structures planned or under construction, or permanently offline.

NOTE: *You should report data for the same cooling water intake structures identified under Question 3 of the previous section.*

Water Source Data

10. (a) Do any of the plant's cooling water intake structures withdraw water from a ***nontidal river*** or ***stream*** **or** a ***tidal river***?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.11, Next Page**

(b) Please provide the water source data requested in the matrix below for each of your cooling water intake structures that withdraw water from a nontidal river or stream ***or*** a tidal river.

Nontidal River or Stream *or* Tidal River: Water Source Data Matrix ___ of ___

Response space has been provided for two cooling water intake structures (CWISs). If your plant has more than this number of intake structures, please copy the matrix and change the CWIS code names or numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	CWIS _____ [Please insert same no. or name as in Question 3 in Section A]	CWIS _____ [Please insert same no. or name as in Question 3 in Section A]
10(b)(1)	Name of ***Water Body***		
10(b)(2)	***Mean Annual Flow*** of Water Body Available in Latest NPDES Permit or Fact Sheet **(in cubic feet per second or cfs)**	_____cfs (1) Data Not Available . . . . . ◯(8)	_____cfs (1) Data Not Available . . . . . ◯(8)
10(b)(3)	***7Q10 Value*** for Non-tidal Rivers (or Annual Low Flow for previous hydrologic year if 7Q10 is unavailable) and the *Mean Tidal Volume* for Tidal Rivers if Available in Latest NPDES Fact Sheet or Application **(in cfs)**	_____cfs (1) Data Not Available . . . . . ◯(8)	_____cfs (1) Data Not Available . . . . . ◯(8)

11. (a) Do any of the plant's cooling water intake structures withdraw water from a ***lake***, ***pond*** (other than a cooling pond), or ***reservoir***?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.12, Next Page**

(b) Please provide the water source data requested in the matrix below for each of your cooling water intake structures that withdraw water from a pond, lake, or reservoir.

Lake, Pond (other than a Cooling Pond), or Reservoir: Water Source Data Matrix ___ of ___

Response space has been provided for two cooling water intake structures (CWISs). If your plant has more than this number of intake structures, please copy the matrix and change the CWIS code numbers or names as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	CWIS_____ [Please insert same no. or name as in Question 3 in Section A]	CWIS_____ [Please insert same no. or name as in Question 3 in Section A]
11(b)(1)	Name of Water Body		
11(b)(2)	Water Body Volume at Annual Mean Water Level **(in acre feet)**	_____ acre feet (1) Great Lakes *(Not Applicable)* . . ◯(2) Data Not Available . . . . . ◯(8)	_____ acre feet (1) Great Lakes *(Not Applicable)* . . ◯(2) Data Not Available . . . . . ◯(8)
11(b)(3)	Surface Area at Mean Water Level **(in acres)**	_____acres (1) Great Lakes *(Not Applicable)* . . ◯(2) Data Not Available . . . . . ◯(8)	_____ acres (1) Great Lakes *(Not Applicable)* . . ◯(2) Data Not Available . . . . . ◯(8)
11(b)(4)	Area at Minimum ***Conservation Pool*** Level **(in acres)** **NOTE:** *Please refer to the Glossary for the definition of conservation pool.*	_____ acres (1) Data Not Available . . . . . ◯(8) Great Lakes *(Not Applicable)* . . ◯(2) Not Applicable/Water Source Is Not a Constructed Reservoir . . ◯(3)	_____ acres (1) Data Not Available . . . . . ◯(8) Great Lakes *(Not Applicable)* . . ◯(2) Not Applicable/Water Source Is Not a Constructed Reservoir . . ◯(3)
11(b)(5)	Volume at Minimum Conservation Pool Level **(in acre-feet)**	_____ acre-feet (1) Data Not Available . . . . . ◯(8) Great Lakes *(Not Applicable)* . . ◯(2) Not Applicable/Water Source Is Not a Constructed Reservoir . . ◯(3)	_____acre-feet (1) Data Not Available . . . . . ◯(8) Great Lakes *(Not Applicable)* . . ◯(2) Not Applicable/Water Source Is Not a Constructed Reservoir . . ◯(3)

12. (a) Do any of the plant's intake structures withdraw cooling water from an ***estuary*** or ***ocean***?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.13, Next Page**

(b) Please provide the water source data requested in the matrix below for each of your cooling water intake structures that withdraw water from an estuary or ocean.

Estuary or Ocean: Water Source Data Matrix ___ of ___

Response space has been provided for two cooling water intake structures (CWISs). If your plant has more than this number of intake structures, please copy the matrix and change the CWIS code names or numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	CWIS_____ [Please insert same no. or name as in Question 3 in Section A]	CWIS_____ [Please insert same no. or name as in Question 3 in Section A]
12(b)(1)	Name of Water Body		
12(b)(2)	***Mean Low Tidal Water Level*** (in feet relative to the ***National Geodetic Vertical Datum (NGVD))***	_____ feet (1) Data Not Available . . . . . ◯(8)	_____ feet (1) Data Not Available . . . . . ◯(8)
12(b)(3)	***Mean High Tidal Water Level*** (in feet relative to NGVD)	_____ feet (1) Data Not Available . . . . . ◯(8)	_____ feet (1) Data Not Available . . . . . ◯(8)

Intake Arrangements

▶ Please refer to the **Glossary** accompanying the questionnaire for schematics of the various intake configurations discussed in this subsection of the technical questionnaire.

13. (a) Does your plant have any ***intake canals/channels***?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.14, Next Page**

(b) Please provide the general design data requested in the matrix below for the plant's intake canals/channels.

Intake Canal (or Channel) Configurations Matrix ___ of ___

Response space has been provided for two cooling water intake structures (CWISs). If your plant has more than this number of intake structures, please copy the matrix and change the CWIS code names or numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	CWIS_____ [Please insert same no. or name as in Question 3 in Section A]	CWIS_____ [Please insert same no. or name as in Question 3 in Section A]
13(b)(1)	Length from Canal Mouth to Pumps **(in feet)**	_____ feet	_____ feet
13(b)(2)	Average Cross-Sectional Area of the Intake Structure Opening which is Submerged when the Source Water is at Mean Low Water Level (for Tidal) or 7Q10 (for non-Tidal) **(in square feet)**	_____ ft^2 (1)	_____ ft^2 (1)
	Average Cross-Sectional Area of the Intake Structure Opening which is Submerged when the Source Water is at Mean Annual Water Level **(in square feet)**	_____ ft^2 (2)	_____ ft^2 (2)
13(b)(3)	Distance of ***Skimmer/Curtain/or Baffle Wall from Canal Mouth*** **(in feet) [Please check (✓) "none installed" if a particular CWIS does not have a skimmer, curtain, or baffle wall.]**	_____ feet (1) None Installed . . . . . ◯(2)	_____ feet (1) None Installed . . . . . ◯(2)

NOTE: *The intake structure opening would be that point where water first enters the cooling water intake structure. For example, if the plant has a cooling canal, the opening would be at the mouth of the canal.*

14. (a) Does your plant have any cooling water intake structures that are situated on or that incorporate a ***bay*** or ***cove*** (natural or constructed)?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.15, Next Page**

(b) Please provide the general design data requested in the matrix below for the bays or coves associated with the plant's intake structures.

Bay or Cove (natural or constructed) Intake Structure Configurations Matrix ___ of ___

Response space has been provided for two cooling water intake structures (CWISs). If your plant has more than this number of intake structures, please copy the matrix and change the CWIS code names or numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	CWIS_____ [Please insert same no. or name as in Question 3 in Section A]	CWIS_____ [Please insert same no. or name as in Question 3 in Section A]
14(b)(1)	Average Water Depth of Bay or Cove at Withdrawal Point **(in feet)**	_____ feet	_____ feet

15. (a) Does your plant have any ***shoreline intake structures?***

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.16, Next Page**

(b) Please provide the general design data requested in the matrix below for the plant's shoreline intake structures.

Shoreline Intake Structure Configurations Matrix ___ of ___

Response space has been provided for two cooling water intake structures (CWISs). If your plant has more than this number of intake structures, please copy the matrix and change the CWIS code names or numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	CWIS_____ [Please insert same no. or name as in Question 3 in Section A]	CWIS_____ [Please insert same no. or name as in Question 3 in Section A]
15(b)(1)	Type of Intake **[Please check (✓) only one intake type per CWIS.]**	Surface Shoreline . . . . . ◯(1) Submerged Shoreline . . . . . ◯(2)	Surface Shoreline . . . . . ◯(1) Submerged Shoreline . . . . . ◯(2)
15(b)(2)	Location of Intake Entrance **[Please check (✓) only one intake location per CWIS.]**	Flush with Shoreline . . . . . ◯(1) Recessed . . . . . ◯(2) Protruding Offshore . . . . . ◯(3)	Flush with Shoreline . . . . . ◯(1) Recessed . . . . . ◯(2) Protruding Offshore . . . . . ◯(3)
15(b)(3)	Depth of Water Source at Withdrawal Point **(in feet)**	_____ feet	_____ feet
15(b)(4)	Average Distance between the Top (i.e., crown) of the Intake Structure Opening and Water Surface (if submerged) (**in feet at mean water level**)	_____ feet(1) NA . . . . . ◯(9)	_____ feet(1) NA . . . . . ◯(9)
15(b)(5)	Average Distance between the Bottom (i.e., invert) of the Intake Structure Opening and the Water Surface **(in feet at mean water level)**	_____ feet	_____ feet
15(b)(6)	Skimmer/Curtain/or Baffle Wall Installed?	Yes . . . . . ◯(1) No . . . . . ◯(2)	Yes . . . . . ◯(1) No . . . . . ◯(2)

16. (a) Does your plant have any ***submerged offshore intake structures***?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.17**

(b) Please provide the general design data requested in the matrix below for the plant's submerged offshore intake structures.

Submerged Offshore Intake Structure Configurations Matrix ___ of ___

Response space has been provided for two cooling water intake structures (CWISs). If your plant has more than this number of intake structures, please copy the matrix and change the CWIS code names or numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	CWIS_____ [Please insert same no. or name as in Question 3 in Section A]	CWIS_____ [Please insert same no. or name as in Question 3 in Section A]
16(b)(1)	Distance from Shore **(in feet)**	_____ feet	_____ feet
16(b)(2)	Depth of Water Source at Withdrawal Point **(in feet)**	_____ feet	_____ feet
16(b)(3)	Average Distance of the Top (e.g., crown) of the Intake Structure Opening Below Water Surface **(in feet)**	_____ feet (1)	_____ feet (1)
	Average Distance of the Bottom (e.g., invert) of the Intake Structure Opening Below Water Surface **(in feet)**	_____ feet (2)	_____ feet (2)

17. Provide the following information on proximity of the plant's cooling water intake structure to sensitive aquatic ecological areas. **[Please check (✓) all applicable items for each intake structure.**]

NOTE: *Please provide the requested information assuming typical or average meteorological flow, and operational conditions.*

Proximity of Intake Structures to Sensitive Aquatic Ecological Areas

If your plant has more than two cooling water intake structures, please copy the matrix and change the CWIS code names or numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc. [Please insert same CWIS no. or name as in Question 3 in Section A]

Item No.	Data Requested	CWIS_____	CWIS_____
17(a)	***Wetlands***	Within 100 Meters of the CWIS Opening . . . . . ○(1) None . . . . . ○(2) Data Not Available . . . . . ○(8)	Within 100 Meters of the CWIS Opening . . . . . ○(1) None . . . . . ○(2) Data Not Available . . . . . ○(8)
17(b)	***Confluence of Tributaries*** Where Third Order Streams or Larger Come Together	Within 100 Meters of the CWIS Opening . . . . . ○(1) None . . . . . ○(2) Data Not Available . . . . . ○(8)	Within 100 Meters of the CWIS Opening . . . . . ○(1) None . . . . . ○(2) Data Not Available . . . . . ○(8)
17(c)	Sensitive and/or Primary Aquatic Life Habitat Areas (e.g., ***Fish/Shellfish Spawning and Nursery Areas, Submerged Vegetation, Reefs,*** etc.)	Within 100 Meters of the CWIS Opening . . . . . ○(1) None . . . . . ○(2) Data Not Available . . . . . ○(8)	Within 100 Meters of the CWIS Opening . . . . . ○(1) None . . . . . ○(2) Data Not Available . . . . . ○(8)
17(d)	***Protected Aquatic Sanctuaries*** on the Source Water Shed	Within 100 Meters of the CWIS Opening . . . . . ○(1) None . . . . . ○(2) Data Not Available . . . . . ○(8)	Within 100 Meters of the CWIS Opening . . . . . ○(1) None . . . . . ○(2) Data Not Available . . . . . ○(8)
17(e)	Designated ***Critical Aquatic Habitat*** of Any Threatened, or Endangered Aquatic Species (U.S. Fish and Wildlife Service and National Marine Fisheries Service)	Within 100 Meters of the CWIS Opening . . . . . ○(1) None . . . . . ○(2) Data Not Available . . . . . ○(8)	Within 100 Meters of the CWIS Opening . . . . . ○(1) None . . . . . ○(2) Data Not Available . . . . . ○(8)
17(f)	Aquatic ***Migratory Routes***	Within 100 Meters of the CWIS Opening . . . . . ○(1) None . . . . . ○(2) Data Not Available . . . . . ○(8)	Within 100 Meters of the CWIS Opening . . . . . ○(1) None . . . . . ○(2) Data Not Available . . . . . ○(8)
17(g)	Commercial and/or Recreational Fishing Areas (e.g., State parks, wildlife refuge areas, designated hunting and fishing areas)	Within 100 Meters of the CWIS Opening . . . . . ○(1) None . . . . . ○(2) Data Not Available . . . . . ○(8)	Within 100 Meters of the CWIS Opening . . . . . ○(1) None . . . . . ○(2) Data Not Available . . . . . ○(8)

Section C: Cooling Water Intake Structure Technology Information

Please answer the questions in this section of the questionnaire for ***only*** those intake structures that directly withdraw surface water to support contact and non-contact cooling operations within the plant. Consider ***only*** those intake structures that are presently operating and those temporarily offline but expected to be returned to service. Do ***not*** include intake structures planned or under construction or permanently offline.

NOTE: *You should report data for the same intake structures considered under the previous two sections of the questionnaire.*

Bar Racks and Screening Technologies

18. (a) Do you employ ***bar racks/trash racks*** at any of the plant's cooling water intake structures?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.19, Next Page**

(b) Please provide the names or numbers for those cooling water intake structures (CWISs) where bar racks/trash racks are employed. **[Please insert same code names or numbers as listed under Question 3 in Section A.]**

CWIS _____(1) CWIS _____(2) CWIS _____(3)

CWIS _____(4) CWIS _____(5)

19. (a) Do you employ ***traveling*** or ***other intake screen systems*** at any of the plant's cooling water intake structures?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.20, Page 28**

(b) In the matrix below, please identify the cooling water intake structures that employ traveling or other intake screen systems. **[Please check (✓) all traveling or other intake screen system technologies that apply per cooling water intake structure.]**

Matrix 19(b) Matrix ___ of ___

Traveling or Other Screen System Technologies

Response space has been provided for two cooling water intake systems (CWISs). If your plant has more than this number of CWISs, please copy the matrix and change the CWIS code names or numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Technology Codes	Traveling or Other Intake Screen System Technologies [Please check (✓) all technologies that apply per CWIS.]	CWIS _____ [Please insert same no. or name as under Question 3 in Section A]	CWIS _____ [Please insert same no. or name as under Question 4 in Section A]
A	Horizontal Drum	◯(1)	◯(1)
B	Vertical Drum	◯(2)	◯(2)
C	Rotating Disk	◯(3)	◯(3)
D	Fixed	◯(4)	◯(4)
E1	Vertical Single Entry/Exit Traveling	◯(5)	◯(5)
E2	Modified Vertical Single Entry/Exit Traveling (Ristroph)	◯(6)	◯(6)
E3	Incline Single Entry/Exit Traveling	◯(7)	◯(7)
E4	Single Entry/Double Exit Traveling (Center Flow)	◯(10)	◯(10)
E5	Double Entry/Single Exit Traveling (Dual Flow)	◯(11)	◯(11)
E6	Horizontal Traveling	◯(12)	◯(12)
F	Other (*please describe below*):	◯(13)	◯(13)

(c) For those cooling water intake structures where traveling or other intake screen systems are employed, please provide the technology data requested in the matrices beginning on the next page.

NOTE: *A separate matrix has been provided for two cooling water intake structures. If you have more than this number of intake structures, please copy the matrix and change the cooling water intake structure code names or numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.*

Plants that employ more than one traveling or other intake screen system technology at a given intake structure should fill out a separate column in the matrix for **each different technology**. If a given intake structure has multiple traveling or other intake screen system technologies that are **substantially similar** in design and operation, only one column of the matrix needs to be completed. However, please report the number of technology units that are similar. If there are differences in the design or operation of the same technology employed at a given intake structure (i.e., different manufacturers, different ages, etc.), separate columns of the matrix should be completed.

① **CWIS**_____ **[Please insert same code no. or name as in Question 3 in Section A]** Matrix ___ of ___

Traveling or Other Intake Screen System Technology Data by Cooling Water Intake Structure (CWIS)

Response space has been provided for three different traveling or other intake screen system technologies. If you employ more than this number of technologies for a given CWIS, please copy the matrix and continue noting your technologies. Please, however, change the technology code numbers. Attach any additional matrix sheets to this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	Traveling or Other Intake Screen System Technology #1	Traveling or Other Intake Screen System Technology #2	Traveling or Other Intake Screen System Technology #3
19(c)(1)	Type of Technology **[Provide Technology Code from Matrix 19(b), page 24. Use codes A through F.]**			
19(c)(2)	Manufacturer (Mfr.) Name and Model of System	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . . . ○(3) Don't Know . . . . . ○(8)	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . . ○(3) Don't Know . . . . . ○(8)	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . . . ○(3) Don't Know . . . . . ○(8)
19(c)(3)	Mesh Size of System **[Please check (✓) only one response per technology.]**	Standard (⅜ to ¾ in) . . ○(1) Fine (5 mm or less) . . . . ○(2) Other (*please describe below*) ○(3)	Standard (⅜ to ¾ in) . ○(1) Fine (5 mm or less) . . . ○(2) Other (*please describe below*) ○(3)	Standard (⅜ to ¾ in) . . ○(1) Fine (5 mm or less) . . . . ○(2) Other (*please describe below*) ○(3)
19(c)(4)	Number of Systems of this Type with Same Design and Operational Description			
19(c)(5)	Calendar Year(s) System Installed (e.g., 1991)	Year(s): _____ Don't Know . . . . . ○(8)	Year(s): _____ Don't Know . . . . . ○(8)	Year(s): _____ Don't Know . . . . . ○(8)

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② **CWIS**_____ **[Please insert same code no. or name as in Question 3 in Section A]** Matrix ___ of ___

Traveling or Other Intake Screen System Technology Data by Cooling Water Intake Structure (CWIS)

Response space has been provided for three different traveling or other intake screen system technologies. If you employ more than this number of technologies for a given CWIS, please copy the matrix and continue noting your technologies. Please, however, change the technology code numbers. Attach any additional matrix sheets to this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	Traveling or Other Intake Screen System Technology #1	Traveling or Other Intake Screen System Technology #2	Traveling or Other Intake Screen System Technology #3
19(c)(1)	Type of Technology **[Provide Technology Code from Matrix 19(b), page 24. Use codes A through F.]**			
19(c)(2)	Manufacturer (Mfr.) Name and Model of System	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . . . ○(3) Don't Know . . . . . ○(8)	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . . ○(3) Don't Know . . . . . ○(8)	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . . ○(3) Don't Know . . . . . ○(8)
19(c)(3)	Mesh Size of System **[Please check (✓) only one response per technology.]**	Standard (⅜ to ¾ in) . . ○(1) Fine (5 mm or less) . . . . ○(2) Other (*please describe* below): ○(3)	Standard (⅜ to ¾ in) . ○(1) Fine (5 mm or less) . . . ○(2) Other (*please describe below*):○(3)	Standard (⅜ to ¾ in) . ○(1) Fine (5 mm or less) . . . ○(2) Other (*please describe* below): ○(3)
19(c)(4)	Number of Systems of this Type with Same Design and Operational Description			
19(c)(5)	Calendar Year(s) System Installed (e.g., 1991)	Year(s): _____ Don't Know . . . . . ○(8)	Year(s): _____ Don't Know . . . . . ○(8)	Year(s): _____ Don't Know . . . . . ○(8)

20. (a) Do you employ traveling or other intake screen systems at the plant to reduce ***impingement*** and/or ***entrainment*** effects on aquatic organisms?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.21, Next Page**

(b) For the applicable cooling water intake structures, please show in the matrix below the types of intake screen systems used.

DEFINITIONS

For the purposes of this questionnaire, **impingement** refers to the trapping and holding of aquatic organisms to the outer part of an intake structure or against screening devices during periods of cooling water withdrawal.

For the purposes of this questionnaire, **entrainment** refers to the merging of small aquatic organisms with the flow of cooling water entering and passing through a cooling water intake structure, and thus, into a water system.

Traveling or Other Intake Screen Systems to Reduce Impingement and/or Entrainment Matrix ___ of ___

Response space has been provided for two cooling water intake structures (CWISs). If your plant has more than this number of CWISs, please copy the matrix. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Data Requested	CWIS _____ [Please insert same no. or name as in Question 3 in Section A]	CWIS _____ [Please insert same no. or name as in Question 3 in Section A]
Traveling or Other Intake Screen Systems Used. **[Please check (✓) all modifications that apply per CWIS.]**	Low-Pressure Spray Wash or Fish Spray ◯(1)	Low-Pressure Spray Wash or Fish Spray ◯(1)
	Change in Angle of Spray Wash Relative to Screen Surface . . . . . ◯(2)	Change in Angle of Spray Wash Relative to Screen Surface . . . . . ◯(2)
	Separate Fish and Debris Troughs . . . . ◯(3)	Separate Fish and Debris Troughs . . . . ◯(3)
	Both Front and Back Spray Washes . . . ◯(4)	Both Front and Back Spray Washes . . . ◯(4)
	Fish Buckets, Baskets, or Trays . . . . . ◯(5)	Fish Buckets, Baskets, or Trays . . . . . ◯(5)
	Other (*please describe below*): . . . . . ◯(6)	Other (*please describe below*): . . . . . ◯(6)

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Passive Intake System Technologies

21. (a) Do you employ ***passive intake systems*** at any of the plant's cooling water intake structures?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.22, Page 32**

(b) In the matrix below, please identify the cooling water intake structures that employ passive intake systems. **[Please check (✓) all passive intake system technologies that apply per cooling water intake structure.]**

Matrix 21(b) Matrix ___ of ___

Passive Intake System Technologies

Response space has been provided for two cooling water intake structures (CWISs). If your plant has more than this number of CWISs, please copy the matrix and change the CWIS code names or numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Technology Codes	Passive Intake System Technologies [Please check (✓) all technologies that apply per CWIS.]	CWIS _____ [Please insert same no. or name as in Question 3 in Section A]	CWIS _____ [Please insert same no. or name as Question 3 in Section A]
G	Wedge-Wire Screen	◯(1)	◯(1)
H	Perforated Pipe	◯(2)	◯(2)
I	Porous Dike	◯(3)	◯(3)
J	Leaky Dam	◯(4)	◯(4)
K	Artificial Filter Bed	◯(5)	◯(5)
L	Other (please describe below):	◯(6)	◯(6)

(c) For those cooling water intake structures where passive intake systems are employed, please provide the technology data requested in the following matrices.

Plants that employ more than one passive intake system technology at a given cooling water intake structure should fill out a separate column in the matrix for **each different technology**. If a given intake structure has multiple passive intake system technologies that are **substantially similar** in design and operation, only one column of the matrix needs to be completed. However, please report the number of technology units that are similar. If there are differences in the design or operation of the same technology employed at a given intake structure (i.e., different manufacturers, different ages, etc.), separate columns of the matrix should be completed.

① CWIS_____ **[Please insert same code no. or name as in Question 3 in Section A]** Matrix ___ of ___

Passive Intake System Technology Data by Cooling Water Intake Structure (CWIS)

Response space has been provided for three different passive intake screen system technologies. If you employ more than this number of technologies for a given CWIS, please copy the matrix and continue noting your technologies. Please, however, change the technology code numbers. Attach any additional matrix sheets to this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	Passive Intake System Technology #1	Passive Intake System Technology #2	Passive Intake System Technology #3
21(c)(1)	Type of Technology **[Provide Technology Code from Matrix 21(b), page 29. Use codes G through L.]**			
21(c)(2)	Manufacturer (Mfr.) Name and Model of System	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . ○(3) Don't Know . . . . . ○(8)	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . ○(3) Don't Know . . . . . ○(8)	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . ○(3) Don't Know . . . . . ○(8)
21(c)(3)	Number of Systems of This Type with Same Design and Operational Description			
21(c)(4)	Calendar Year(s) System Installed (e.g., 1991)	Year(s): _____ Don't Know . . . . . ○(8)	Year(s): _____ Don't Know . . . . . ○(8)	Year(s): _____ Don't Know . . . . . ○(8)

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② **CWIS**_____ **[Please insert same code no. or name as in Question 3 in Section A]** Matrix ___ of ___

Passive Intake System Technology Data by Cooling Water Intake Structure (CWIS)

Response space has been provided for three different passive intake screen system technologies. If you employ more than this number of technologies for a given CWIS, please copy the matrix and continue noting your technologies. Please, however, change the technology code numbers. Attach any additional matrix sheets to this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	Passive Intake System Technology #1	Passive Intake System Technology #2	Passive Intake System Technology #3
21(c)(1)	Type of Technology **[Provide Technology Code from Matrix 21(b), page 29. Use codes G through L.]**			
21(c)(2)	Manufacturer (Mfr.) Name and Model of System	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . ○(3) Don't Know . . . . . ○(8)	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . ○(3) Don't Know . . . . . ○(8)	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . ○(3) Don't Know . . . . . ○(8)
21(c)(3)	Number of Systems of This Type with Same Design and Operational Description			
21(c)(4)	Calendar Year(s) System Installed (e.g., 1991)	Year(s): _____ Don't Know . . . . . ○(8)	Year(s): _____ Don't Know . . . . . ○(8)	Year(s): _____ Don't Know . . . . . ○(8)

Fish Diversion or Avoidance System Technologies

22. (a) Do you employ ***fish diversion or avoidance system*** technologies at any of the plant's cooling water intake structures?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.23, Page 35**

(b) Please identify the cooling water intake structures that employ fish diversion or avoidance systems in the matrix below. **[Please check (✓) all fish diversion or avoidance system technologies that apply per cooling water intake structure.]**

Matrix 22(b) Matrix ___ of ___

Fish Diversion or Avoidance System Technologies

Response space has been provided for two cooling water intake structures (CWISs). If your plant has more than this number of CWISs, please copy the matrix and change the CWIS code names or numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Technology Codes	Fish Diversion or Avoidance System Technologies [Please check (✓) all technologies that apply per CWIS.]	CWIS _____ [Please insert same no. or name as in Question 3 in Section A]	CWIS _____ [Please insert same no. or name as in Question 3 in Section A]
M	Velocity Cap	◯(1)	◯(1)
N	Louver Barrier	◯(2)	◯(2)
O	Water Jet Barrier	◯(3)	◯(3)
P	Fish Net Barrier	◯(4)	◯(4)
Q	Air Bubble Barrier	◯(5)	◯(5)
R	Electrical Barrier	◯(6)	◯(6)
S	Light Barrier	◯(7)	◯(7)
T	Sound Barrier	◯(10)	◯(10)
U	Cable or Chain Barrier	◯(11)	◯(11)
V	Other (please describe below):	◯(12)	◯(12)

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(c) For those cooling water intake structures where fish diversion and/or avoidance systems are employed, please provide the technology data requested in the matrices beginning on the next page.

Plants that employ more than one fish diversion and/or avoidance system technology at a given cooling water intake structure should fill out a separate column in the matrix for **each different technology**. If a given intake structure has multiple fish diversion and/or avoidance system technologies that are **substantially similar** in design and operation, only one column of the matrix needs to be completed. However, please report the number of technology units that are similar. If there are differences in the design or operation of the same technology employed at a given intake structure (i.e., different manufacturers, different ages, etc.), separate columns should be completed.

① **CWIS** _____ **[Please insert same no. or name as in Question 3 in Section A]** Matrix ___ of ___

Fish Diversion or Avoidance System Technology Data by Cooling Water Intake Structure (CWIS)

Response space has been provided for three different fish diversion or avoidance system technologies. If you employ more than this number of technologies for a given CWIS, please copy the matrix and continue noting your technologies. Please, however, change the technology code numbers. Attach any additional matrix sheets to this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	Fish Diversion and/or Avoidance System Technology #1	Fish Diversion and/or Avoidance System Technology #2	Fish Diversion and/or Avoidance System Technology #3
22(c)(1)	Type of Technology **[Provide Technology Code from Matrix 22(b), page 32. Use codes M through V.]**			
22(c)(2)	Manufacturer (Mfr.) Name and Model of System	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . . ○(3) Don't Know . . . . . ○(8)	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . ○(3) Don't Know . . . . . ○(8)	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . . ○(3) Don't Know . . . . . ○(8)
22(c)(3)	Number of Systems of This Type with Same Design and Operational Description			
22(c)(4)	Calendar Year(s) System Installed (e.g., 1991)	Year(s): _____ Don't Know . . . . . ○(8)	Year(s): _____ Don't Know . . . . . ○(8)	Year(s): _____ Don't Know . . . . . ○(8)

② **CWIS** _____ **[Please insert same no. or name as in Question 3 in Section A]** Matrix ___ of ___

Fish Diversion or Avoidance System Technology Data by Cooling Water Intake Structure (CWIS)

Response space has been provided for three different fish diversion or avoidance system technologies. If you employ more than this number of technologies for a given CWIS, please copy the matrix and continue noting your technologies. Please, however, change the technology code numbers. Attach any additional matrix sheets to this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	Fish Diversion and/or Avoidance System Technology #1	Fish Diversion and/or Avoidance System Technology #2	Fish Diversion and/or Avoidance System Technology #3
22(c)(1)	Type of Technology **[Provide Technology Code from Matrix 22(b), page 32. Use codes M through V.]**			
22(c)(2)	Manufacturer (Mfr.) Name and Model of System	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . . ○(3) Don't Know . . . . . ○(8)	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . ○(3) Don't Know . . . . . ○(8)	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . . ○(3) Don't Know . . . . . ○(8)
22(c)(3)	Number of Systems of This Type with Same Design and Operational Description			
22(c)(4)	Calendar Year(s) System Installed (e.g., 1991)	Year(s): _____ Don't Know . . . . . ○(8)	Year(s): _____ Don't Know . . . . . ○(8)	Year(s): _____ Don't Know . . . . . ○(8)

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Fish Handling and/or Return Technologies

23. (a) Do you employ ***fish handling and/or return systems*** at any of the plant's cooling water intake structures?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.24, Page 39**

(b) In the matrix below, please identify the cooling water intake structures that employ fish handling and/or return systems. **[Please check (✓) all fish handling and/or return systems that apply per cooling water intake structure.]**

Matrix 23(b) Matrix ___ of ___

Fish Handling and/or Return System Technologies

Response space has been provided for two cooling water intake structures (CWISs). If your plant has more than this number of CWISs, please copy the matrix and change the CWIS code names or numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Technology Codes	Fish Diversion or Avoidance System Technologies [Please check (✓) all technologies that apply per CWIS.]	CWIS _____ [Please insert same no. or name as in Question 3 in Section A]	CWIS _____ [Please insert same no. or name as in Question 3 in Section A]
W	Fish Pump	◯(1)	◯(1)
X	Fish Conveyance System (Troughs or Pipes)	◯(2)	◯(2)
Y	Fish Elevator/Lift Baskets	◯(3)	◯(3)
Z	Fish Bypass System	◯(4)	◯(4)
AA	Fish Holding Tank	◯(5)	◯(5)
BB	Other (please describe below):	◯(6)	◯(6)

(c) For those cooling water intake structures where fish handling and/or return systems are employed, please provide the technology data requested in the matrices beginning on the next page.

NOTE: *Response space has been provided for three different fish handling and/or return system technologies. If you employ more than this number of technologies for a given CWIS, please copy the matrix and continue noting your technologies. Please, however, change the technology code numbers. Attach any additional matrix sheets to this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.*

Plants that employ more than one fish handling and/or return system technology at a given intake structure should fill out a separate column in the matrix for **each different technology**. If a given intake structure has multiple fish handling and/or return system technologies that are **substantially similar** in design and operation, only one column of the matrix needs to be completed. However, please report the number of technology units that are similar. If there are differences in the design or operation of the same technology employed at one intake structure (i.e., different manufacturers, different ages, etc.), separate columns of the matrix should be completed.

① **CWIS** _____ **[Please insert same no. or name as in Question 3 in Section A]** Matrix ___ of ___

Fish Handling and/or Return System Technology Data by Cooling Water Intake Structure (CWIS)

Item No.	Data Requested	Fish Handling and/or Return System Technology #1	Fish Handling and/or Return System Technology #2	Fish Handling and/or Return System Technology #3
23(c)(1)	Type of Technology **[Provide Technology Code from Matrix 23(b), page 35. Use codes W through BB.]**			
23(c)(2)	Manufacturer (Mfr.) and Model of System	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . ○(3) Don't Know . . . . . ○(8)	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . ○(3) Don't Know . . . . . ○(8)	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . ○(3) Don't Know . . . . . ○(8)
23(c)(3)	Number of Systems of this Type with Same Design and Operational Description			
23(c)(4)	Calendar Year(s) Systems Installed (e.g., 1991)	Year(s): _____ Don't Know . . . . . ○(8)	Year(s): _____ Don't Know . . . . . ○(8)	Year(s): _____ Don't Know . . . . . ○(8)
23(c)(5)	Association of Fish Handling and/or Return System with Other Technologies **[Provide Technology Codes from Matrices 19(b), 21(b), and 22(b), pages 24, 29, and 32. Use codes A through BB. Please separate multiple codes per response column with a comma.]**			
23(c)(6)	Final destination of diverted or impinged organisms **[Check all that apply]**	Returned to water body outside the influence of the plant's intake and discharge system . . . ○(1) Returned via the discharge canal . . . . . ○(2) Landfilled or otherwise disposed of . . . . . ○(3) Other (please describe below): ○(4)	Returned to water body outside the influence of the plant's intake and discharge system . . . ○(1) Returned via the discharge canal . . . . . ○(2) Landfilled or otherwise disposed of . . . . . ○(3) Other (please describe below): ○(4)	Returned to water body outside the influence of the plant's intake and discharge system . . . ○(1) Returned via the discharge canal . . . . . ○(2) Landfilled or otherwise disposed of . . . . . ○(3) Other (please describe below): ○(4)

② **CWIS** _____ **[Please insert same no. or name as in Question 3 in Section A]** Matrix ___ of ___

Fish Handling and/or Return System Technology Data by Cooling Water Intake Structure (CWIS)

Item No.	Data Requested	Fish Handling and/or Return System Technology #1	Fish Handling and/or Return System Technology #2	Fish Handling and/or Return System Technology #3
23(c)(1)	Type of Technology **[Provide Technology Code from Matrix 23(b), page 35. Use codes W through BB.]**			
23(c)(2)	Manufacturer (Mfr.) and Model of System	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . . ○(3) Don't Know . . . . . ○(8)	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . . ○(3) Don't Know . . . . . ○(8)	Mfr: _____ (1) Model: _____ (2) Site-Specific Design . . ○(3) Don't Know . . . . . ○(8)
23(c)(3)	Number of Systems of this Type with Same Design and Operational Description			
23(c)(4)	Calendar Year(s) Systems Installed (e.g., 1991)	Year(s): _____ Don't Know . . . . . ○(8)	Year(s): _____ Don't Know . . . . . ○(8)	Year(s): _____ Don't Know . . . . . ○(8)
23(c)(5)	Association of Fish Handling and/or Return System with Other Technologies **[Provide Technology Codes from Matrices 19(b), 21(b), and 22(b), pages 24, 29, and 32. Use codes A through BB. Please separate multiple codes per response column with a comma.]**			
23(c)(6)	Final destination of diverted or impinged organisms **[Check all that apply]**	Returned to water body outside the influence of the plant's intake and discharge system . . . . ○(1) Returned via the discharge canal . . . . . ○(2) Landfilled or otherwise disposed of . . . . . ○(3) Other (please describe below): ○(4)	Returned to water body outside the influence of the plant's intake and discharge system . . . . ○(1) Returned via the discharge canal . . . . . ○(2) Landfilled or otherwise disposed of . . . . . ○(3) Other (please describe below): ○(4)	Returned to water body outside the influence of the plant's intake and discharge system . . . . ○(1) Returned via the discharge canal . . . . . ○(2) Landfilled or otherwise disposed of . . . . . ○(3) Other (please describe below): ○(4)

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ○

Other Design and Operational Data

24. In the matrix below, please provide the design through-screen velocity for each of the plant's cooling water intake structures **(in fps)** and flow basis.

NOTE: *For CWISs that do not employ a screen technology only, please provide a design through-technology velocity at the technology where organisms are most likely to be impinged or entrained. For example, at a submerged intake structure that employs a velocity cap, provide the velocity going through the velocity cap.*

Design Through-Screen Velocity Data by Cooling Water Intake Structure (CWIS) Matrix ___ of ___

Response space has been provided for two CWISs. If your plant has more than this number of CWISs, please copy the matrix and change the CWIS code names or numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	CWIS _____ [Please insert same no. or name as in Question 3 in Section A]	CWIS _____ [Please insert same no. or name as in Question 3 in Section A]
24(a)	Design Through-Screen Velocity **(in fps)**	_____ fps (1) Don't Know . . . . . ○(8)	_____ fps (1) Don't Know . . . . . ○(8)
24(b)	Source Water Flow Basis for Design Through Screen Velocity	Critical Low Flow . . . . . ○(1) Mean Flow . . . . . ○(2) Don't Know . . . . . ○(8)	Critical Low Flow . . . . . ○(1) Mean Flow . . . . . ○(2) Don't Know . . . . . ○(8)

25. For each cooling water intake structure, please note in the following matrices, the ***daily maximum*** and ***daily minimum*** cooling water intake flows **(in GPD)** by month for calendar years 1996 to 1998. **[Daily average flows are calculated by summing all of the actual or calculated daily flows during a particular month and dividing that sum by the total number of calendar days in the month.]** Also, for each month during these calendar years, please note the ***average daily flow*** **(in GPD)**. Finally, please indicate the number of ***operating hours*** by month by calendar year.

If flow data are unavailable for a given reporting month, please check **(✓)** the response titled "No Data." For each calendar year, please indicate whether the data provided are "Actual" or "Calculated."

NOTE: *A separate matrix has been provided for two cooling water intake structures. If you have more than two cooling water intake structures, please copy the matrix and change the cooling water intake structure code names or numbers as appropriate. Please insert any additional matrices into this portion of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.*

① CWIS _____ [Please insert same no. or name as in Question 3 in Section A] Matrix ___ of ___

Actual Intake Flow Rates by Cooling Water Intake Structure (CWIS) by Month for Calendar Years 1996 to 1998

Item No.	(A) Month	(B) Flow Data Requested	(C) Flows in 1996 Actual ○(1) Calculated ○(2)	(D) Flows in 1997 Actual ○(1) Calculated ○(2)	(E) Flows in 1998 Actual ○(1) Calculated ○(2)
25(a)	January	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(b)	February	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(c)	March	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(d)	April	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(e)	May	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(f)	June	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)

① CWIS _____ [Please insert same no. or name as in Question 3 in Section A] Matrix ___ of ___

Actual Intake Flow Rates by Cooling Water Intake Structure (CWIS) by Month for Calendar Years 1996 to 1998

Item No.	(A) Month	(B) Flow Data Requested	(C) Flows in 1996 Actual ○(1) Calculated ○(2)	(D) Flows in 1997 Actual ○(1) Calculated ○(2)	(E) Flows in 1998 Actual ○(1) Calculated ○(2)
25(g)	July	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(h)	August	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(i)	September	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(j)	October	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(k)	November	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(l)	December	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(m)	Annual Totals	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)

② CWIS _____ [Please insert same no. or name as in Question 3 in Section A] Matrix ___ of ___

Actual Intake Flow Rates by Cooling Water Intake Structure (CWIS) by Month for Calendar Years 1996 to 1998

Item No.	(A) Month	(B) Flow Data Requested	(C) Flows in 1996 Actual ○(1) Calculated ○(2)	(D) Flows in 1997 Actual ○(1) Calculated ○(2)	(E) Flows in 1998 Actual ○(1) Calculated ○(2)
25(a)	January	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(b)	February	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(c)	March	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(d)	April	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(e)	May	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(f)	June	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)

② CWIS _____ [Please insert same no. or name as in Question 3 in Section A] Matrix ___ of ___

Actual Intake Flow Rates by Cooling Water Intake Structure (CWIS) by Month for Calendar Years 1996 to 1998

Item No.	(A) Month	(B) Flow Data Requested	(C) Flows in 1996 Actual ○(1) Calculated ○(2)	(D) Flows in 1997 Actual ○(1) Calculated ○(2)	(E) Flows in 1998 Actual ○(1) Calculated ○(2)
25(g)	July	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(h)	August	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(i)	September	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(j)	October	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(k)	November	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(l)	December	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)
25(m)	Annual Totals	Daily Maximum	GPD (1)	GPD (1)	GPD (1)
		Daily Minimum	GPD (2)	GPD (2)	GPD (2)
		Daily Average	GPD (3)	GPD (3)	GPD (3)
		No. Operating Hours	Hours (4)	Hours (4)	Hours (4)
		No Data	No Data ○(8)	No Data ○(8)	No Data ○(8)

26. (a) Has the plant ever implemented cooling water intake flow reduction measures to reduce entrainment?

- ◯ **Yes** (1)
- ◯ **No** (2) ▶ **SKIP TO Q.27, Next Page**
- ◯ **Don't Know** (8) ▶ **SKIP TO Q.27, Next Page**

(b) In the matrix below, please provide more specific information on how the plant has reduced cooling water intake flows to reduce entrainment.

Flow Reduction Data to Reduce Entrainment (by Plant) Matrix ___ of ___

Item No.	Requested Information	Plant Information
26(b)(1)	How has flow been reduced? **[Please check (✓) all flow reduction alternatives that have been used.]**	Cooling Water System(s) Was/(were) Modified From Once-through to Recirculating . . . . . ◯(1) Altered Operations Periodically to Minimize the Use of Cooling Water . . . . . ◯(2) Other *(please describe below):* . . . . . ◯(3)
26(b)(2)	Flow Changes **(in GPD) [For plants that have instituted flow reduction measures on more than one occasion, provide information for an instance most representative of all your flow reduction measures.]**	From _____ GPD to _____ GPD
26(b)(3)	Flow Reduction Period **[Please check (✓) only one response.]**	NA . . . . . ◯(9) Seasonal *(please indicate seasons flow reduced below):* . . ◯(1) Periodic *(please indicate periods flow reduced below):* . . . ◯(2) Other *(please describe below)*: . . . . . ◯(3)

27. (a) Does the plant reduce the temperature of its heated discharge by pumped dilution with surface water?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.28**

(b) Which cooling water intake structures are used to collect the dilution water? **[Please insert same no. or name as in Question 3 in Section A.]**

CWIS _____
CWIS _____
CWIS _____

28. (a) Does the plant employ ice control systems at any of its cooling water intake structures?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.29**

(b) What type of ice control systems are employed at the plant's cooling water intake structures? **[Please check (✓) all ice control systems that apply.]**

Hot Water Recirculation . . . . . ◯ (1)

Air Bubbles . . . . . ◯ (2)

Propeller Agitation . . . . . ◯ (3)

Other (*Please describe below*): . . . . . ◯ (4)

Ineffective Technologies

29. (a) Has your plant ever **used** any technology(ies) to minimize impingement and/or entrainment that was/ (were) later determined to be ineffective? **[Note that pilot studies will be addressed in Section D.]**

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Section D, Page 49**

◯ **Don't Know** (8) ▶ **SKIP TO Section D, Page 49**

(b) For each of the cooling water intake structure, please provide information on some of the plant's experiences of using technologies later found ineffective at minimizing impingement and/or entrainment. Include examples of any experiences that you can recall and that you believe are the most telling regarding a technology's effectiveness at minimizing impingement and/or entrainment.

▶ **INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION** ◯

① **CWIS** __________ **[Please insert same no. or name as in Question 3 in Section A]** Matrix ___ of ___

Ineffective Technology Data

Response space has been provided for three separate experiences. If your plant has had more than this number of experiences, please copy the matrix and continue noting your technologies. Please, however, change the technology numbers in the table heading to reflect the additional technologies (e.g., Ineffective Technology "#4," "#5," etc.). Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	Ineffective Technology #1	Ineffective Technology #2	Ineffective Technology #3
29(b)(1)	Code for Ineffective Technology **[Provide Technology Code from Matrices 19(b), 21(b), 22(b), and 23(b) on pages 24, 29, 32, and 35. Use Technology Codes A through BB.]**			
29(b)(2)	Reasons Technology Ineffective **[Please check (✓) all reasons that apply.]**	Negatively Affected Heat Rate Efficiency . ○(1) Negatively Affected Operations Other Than Heat Rate Efficiency . ○(2) Ineffective with Species Present at CWIS . . . . ○(3) Capital Costs Too High . . . . ○(4) O&M Costs Too High . . . . ○(5) Not Suitable Based on Site and/or Structural Characteristics . . . . . ○(6) Other (please describe below): ○(7)	Negatively Affected Heat Rate Efficiency . ○(1) Negatively Affected Operations Other Than Heat Rate Efficiency . ○(2) Ineffective with Species Present at CWIS . . . . ○(3) Capital Costs Too High . . . . ○(4) O&M Costs Too High . . . . ○(5) Not Suitable Based on Site and/or Structural Characteristics . . . . . ○(6) Other (please describe below): ○(7)	Negatively Affected Heat Rate Efficiency . ○(1) Negatively Affected Operations Other Than Heat Rate Efficiency . ○(2) Ineffective with Species Present at CWIS . . . . ○(3) Capital Costs Too High . . . . ○(4) O&M Costs Too High . . . . ○(5) Not Suitable Based on Site and/or Structural Characteristics . . . . . ○(6) Other (please describe below): ○(7)
29(b)(3)	Code for Technology That Replaced Ineffective Technology **[Provide Technology Code from Matrices 19(b), 21(b), 22(b), or 23(b) on pages 24, 29, 32, and 35. Use Technology Codes A through BB.]**	____________________ (1) No Changes Made . . ○(2)	____________________ (1) No Changes Made . . ○(2)	____________________ (1) No Changes Made . . ○(2)

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ○

② **CWIS** __________ **[Please insert same no. or name as in Question 3 in Section A]** Matrix ___ of ___

Ineffective Technology Data

Response space has been provided for three separate experiences. If your plant has had more than this number of experiences for which you are willing to provide information, please copy the matrix and continue noting your technologies. Please, however, change the technology numbers in the table heading to reflect the additional technologies (e.g., Ineffective Technology "#4," "#5," etc.). Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	Ineffective Technology #1	Ineffective Technology #2	Ineffective Technology #3
29(b)(1)	Code for Ineffective Technology **[Provide Technology Code from Matrices 19(b), 21(b), 22(b), and 23(b) on pages 24, 29, 32, and 35. Use Technology Codes A through BB.]**			
29(b)(2)	Reasons Technology Ineffective **[Please check (✓) all reasons that apply.]**	Negatively Affected Heat Rate Efficiency . ○(1) Negatively Affected Operations Other Than Heat Rate Efficiency . ○(2) Ineffective with Species Present at CWIS . . . . ○(3) Capital Costs Too High . . . . ○(4) O&M Costs Too High . . . . ○(5) Not Suitable Based on Site and/or Structural Characteristics . . . . . ○(6) Other *(please describe below):* ○(7)	Negatively Affected Heat Rate Efficiency . ○(1) Negatively Affected Operations Other Than Heat Rate Efficiency . ○(2) Ineffective with Species Present at CWIS . . . . ○(3) Capital Costs Too High . . . . ○(4) O&M Costs Too High . . . . ○(5) Not Suitable Based on Site and/or Structural Characteristics . . . . . ○(6) Other *(please describe below):* ○(7)	Negatively Affected Heat Rate Efficiency . ○(1) Negatively Affected Operations Other Than Heat Rate Efficiency . ○(2) Ineffective with Species Present at CWIS . . . . ○(3) Capital Costs Too High . . . . ○(4) O&M Costs Too High . . . . ○(5) Not Suitable Based on Site and/or Structural Characteristics . . . . . ○(6) Other *(please describe below):* ○(7)
29(b)(3)	Code for Technology That Replaced Ineffective Technology **[Provide Technology Code from Matrices 19(b), 21(b), 22(b), or 23(b) on pages 24, 29, 32, and 35. Use Technology Codes A through BB.]**	____________________ (1) No Changes Made . . ○(2)	____________________ (1) No Changes Made . . ○(2)	____________________ (1) No Changes Made . . ○(2)

▶ **INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION** ○

Section D: Environmental and Technology Studies and Mitigation Activities

▶ Please answer the questions in this section of the questionnaire for **only** those intake structures that directly withdraw surface water to support contact and noncontact cooling operations within the plant. Consider **only** those intake structures presently operating and those temporarily offline and expected to return to service. Do **not** consider intake structures planned or under construction or permanently offline.

In addition, consider only those cooling water intake structures where the facility has previously undertaken studies that would provide the information requested.

30. Name the aquatic species that are most susceptible to impingement and/or entrainment by one or more of the plant's cooling water intake structures (CWISs).

NOTE: *Please list up to 12 species that are most susceptible to impingement and/or entrainment.*

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

9 _____

10 _____

11 _____

12 _____

Don't Know. . . . . ○(8)

31. Has your plant ever conducted **one or more** of the following types of studies at **any** of its cooling water intake structures:

- study to provide data and information to regulators so they can determine if an adverse environmental impact is occurring and/or if the location, design, construction, and capacity of an intake structure reflects the best technology available for minimizing adverse ***environmental impacts*** [i.e., Section 316(b) Demonstration Study]
- ***discrete biological study of impingement*** and/or ***entrainment***
- discrete study to evaluate the effectiveness of a technology to minimize impingement and/or entrainment?
- ongoing monitoring study of impingement and/or entrainment

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Section E, Page 61**

DEFINITION

For the purposes of this questionnaire, the phrase "**an environmental impact**" means human induced change or pressure on the natural environment.

DEFINITIONS

For the purposes of this questionnaire, **impingement** refers to the trapping and holding of aquatic organisms to the outer part of an intake structure or against screening devices during periods of cooling water withdrawal.

For the purposes of this questionnaire, **entrainment** refers to the merging of small aquatic organisms with the flow of cooling water entering and passing through a cooling water intake structure, and thus, into a water system.

Section 316(b) Demonstration Studies and/or Other Discrete Biological Study of Impingement and/or Entrainment

32. (a) Please indicate the number of discrete biological studies of impingement and/or entrainment, other than those that may have been associated with any Section 316(b) Demonstrations, that your plant has conducted since January 1, 1976.

Number of Studies: _____

(b) Please answer the questions in the matrix beginning on the following page regarding the Section 316(b) Demonstration Study and/or other type of discrete biological study of impingement and/or entrainment conducted by your plant. **NOTE:** *The following matrix requests information on **each Section 316(b) demonstration study** conducted by your plant. In addition, provide information on the most representative other type of discrete biological study of impingement and/or entrainment. You may have to copy the following matrix to be able to accommodate all information.*

Information about Each Section 316(b) Demonstration Study and Most Representative Other Biological Study Matrix ___ of ___

Response space has been provided for one study. If your plant has conducted more than this number of Section 316(b) studies and other discrete biological impingement and/or entrainment studies, please copy the matrix. Complete a separate matrix for each study. Please insert any additional matrix sheets into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	Impingement	Entrainment
32(b)(1)	Please provide the name of the study **[Please check (✓) if the study was a Section 316(b) demonstration study.]**	Name: _____(1) Section 316(b) Demonstration Study . . . . . ○(2)	Name: _____(1) Section 316(b) Demonstration Study . . . . . ○(2)
32(b)(2)	What were the starting and ending dates **(in months and years)** for the study (e.g., 12/1995)?	Starting Date: Month____/Year____ Ending Date: Month____/Year____ Don't Know . . . . . ○(8)	Starting Date: Month____/Year____ Ending Date: Month____/Year____ Don't Know . . . . . ○(8)
32(b)(3)	What was the period of impingement and/or entrainment monitoring (if different from period of study) (e.g., 12/1995)?	Starting Date: Month____/Year____ Ending Date: Month____/Year____ Don't Know . . . . . (8)	Starting Date: Month____/Year____ Ending Date: Month____/Year____ Don't Know . . . . . ○(8)
32(b)(4)	How many cooling water intake structures (CWISs) were covered by the study? Of this number, how many are currently operating or temporarily offline? **[Please note CWISs by using same nos. or names as in Question 3 in Section A. Separate CWISs by a comma if more than one was evaluated.]**	Total No. of CWISs Evaluated: _____(1) Don't Know . . . . . ○(8) Numbers of CWISs Studied That Are Currently Operating or Temporarily Offline: _____, _____, _____, _____ Don't Know . . . . . ○(8)	Total No. of CWISs Evaluated:_____(1) Don't Know . . . . . ○(8) Numbers of CWISs Studied That Are Currently Operating or Temporarily Offline: _____, _____, _____, _____ Don't Know . . . . . ○(8)

Information about Each Section 316(b) Demonstration Study and Most Representative Other Biological Study **Matrix ___ of ___**

Item No.	Data Requested	Impingement	Entrainment
32(b)(5)	Was the number of organisms impinged or entrained, counted?	Yes . . . . . ○(1) No . . . . . ○(2) Don't Know . . . . . ○(8) If you marked **"no"** or **"don't know"** please **SKIP to Item 32(b)(8)**.	Yes . . . . . ○(1) No . . . . . ○(2) Don't Know . . . . . ○(8) If you marked **"no"** or **"don't know"** please **SKIP to Item 32(b)(8)**.
32(b)(6)	Were counts of organisms impinged or entrained identified by species?	Yes . . . . . ○(1) No . . . . . ○(2) Don't Know . . . . . ○(8)	Yes . . . . . ○(1) No . . . . . ○(2) Don't Know . . . . . ○(8)
32(b)(7)	Were counts of organisms impinged or entrained identified by life stage? **[Please check (✓) all that apply.]**	Yes . . . . . ○(1) No . . . . . ○(2) Don't Know . . . . . ○(8) If you marked **"no"** or **"don't know"** please **SKIP to Item 32(b)(8)**.	Yes . . . . . ○(1) No . . . . . ○(2) Don't Know . . . . . ○(8) If you marked **"no"** or **"don't know"** please **SKIP to Item 32(b)(8)**.
32(b)(8)	Indicate the life stages that were identified and counted.	Eggs/Larval Stages: . . . . . ○(1) Juveniles: . . . . . ○(2) Adults: . . . . . ○(3) Total Number: . . . . . ○(4) Other (please describe below): . . . . . ○(5)	Eggs/Larval Stages: . . . . . ○(1) Juveniles: . . . . . ○(2) Adults: . . . . . ○(3) Total Number: . . . . . ○(4) Other (please describe below): . . . . . ○(5)
32(b)(9)	Was the mortality rate of impinged or entrained organisms estimated?	Yes . . . . . ○(1) No . . . . . ○(2) Don't Know . . . . . ○(8)	Yes . . . . . ○(1) No . . . . . ○(2) Don't Know . . . . . ○(8)
32(b)(10)	For any aquatic species, was an analysis undertaken which considered population level impacts related to impingement and/or entrainment.	Yes . . . . . ○(1) No . . . . . ○(2) Don't Know . . . . . ○(8)	Yes . . . . . ○(1) No . . . . . ○(2) Don't Know . . . . . ○(8)

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ○

Information about Each Section 316(b) Demonstration Study and Most Representative Other Biological Study

Matrix ___ of ___

Item No.	Data Requested	Impingement	Entrainment
32(b)(11)	What was the cost of the study? **[Please check (✓) whether the cost figure provided is an estimate or based on actual data.]**	Cost $_____ Actual ○(1) Estimate ○(2) Year Cost Incurred _____ (3) No Data Available to Provide Estimate ..... ○(8)	Cost $_____ Actual ○(1) Estimate ○(2) Year Cost Incurred _____ (3) No Data Available to Provide Estimate ..... ○(8)
32(b)(12)	Are study methodology and findings readily available for review by EPA? **[Please provide explanation of a "no" response.]**	Yes ..... ○(1) No *(please explain):* ..... ○(2)	Yes ..... ○(1) No *(please explain):* ..... ○(2)
32(b)(13)	Did study findings lead to changes being made in the ***types of CWIS technologies*** being used?	Yes ..... ○(1) No ..... ○(2) Don't Know ..... ○(3) On-going Study, Findings Not Yet Available ..... ○(4) If you marked **"no," "don't know,"** or "**on-going study**" please **SKIP to Item 32(b)(15) in the matrix.**	Yes ..... ○(1) No ..... ○(2) Don't Know ..... ○(3) On-going Study, Findings Not Yet Available ..... ○(4) If you marked **"no," "don't know,"** or "**on-going study**" please **SKIP to Item 32(b)(15) in the matrix.**
32(b)(14)	Please briefly describe the **type of technology changes** that were made, why they were made, and whether the changes were related to an existing CWIS. **[Please identify the CWIS using the code established in Question 3, Section A, of the questionnaire. Separate identification codes by a comma if more than one CWIS was affected.]** ***Example:*** The study led the plant to switch from Technology "X" on CWIS #1 to Technology "Y" because Technology "Y" was found to be more effective at minimizing the impingement of Organism "X."	**Type of Changes:**(1) **Why Changes Made:**(2) **Relationship to Existing CWISs:**(3)	**Type of Changes:**(1) **Why Changes Made:**(2) **Relationship to Existing CWISs:**(3)

Information about Each Section 316(b) Demonstration Study and Most Representative Other Biological Study

Matrix ___ of ___

Item No.	Data Requested	Impingement	Entrainment
32(b)(15)	Did study findings lead to changes being made in the **operation of the plant** (e.g., changes in flow volumes, periods of operation, etc.)?	Yes . . . . . ○(1) No . . . . . ○(2) Don't Know . . . . . ○(8) On-going Study, Findings Not Yet Available . . . . . ○(4) If you marked **"no," "don't know,"** or "**on-going study**" please **SKIP TO Q.33.**	Yes . . . . . ○(1) No . . . . . ○(2) Don't Know . . . . . ○(8) On-going Study, Findings Not Yet Available . . . . . ○(4) If you marked **"no," "don't know,"** or "**on-going study**" please **SKIP TO Q.33.**
32(b)(16)	Please briefly describe the type of **operational changes** that were made, why they were made, and whether the changes were related to an existing CWIS. **[Please identify the CWIS using the code established under Question 3, Section A, of the questionnaire. Separate identification codes by a comma if more than one CWIS was affected.]** ***Example:*** The study led the plant to reduce its flow on CWISs #1 and #2 from "xx MGD" to "yy MGD" each during the months of "XX, XY, and YY." The flow reduction was pursued to minimize the impingement of juveniles of Organism "X."	**Type of Changes:**(1) **Why Changes Made:**(2) **Relationship to Existing CWISs:**(3)	**Type of Changes:**(1) **Why Changes Made:**(2) **Relationship to Existing CWISs:**(3)

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Discrete Study to Evaluate the Effectiveness of a Technological or Operational Change

33. (a) Has the plant performed any biological studies (**not** including studies addressed in Q.32) to evaluate the effectiveness of a technology or operational change (e.g., adjustment of flow volumes, periods of withdrawal, etc.) to minimize impingement and/or entrainment of aquatic organisms at one or more of the plant's cooling water intake structures?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.34, Page 58**

(b) Please answer the questions in the matrix below for the **most recent** or **most representative** impingement and/or entrainment study of technological or operational changes at one or more of the plant's cooling water intake structures. [This study should **not** have been part of any study addressed in the previous question.]

Most Recent (or Most Representative) Impingement and/or Entrainment Study of Technology and/or Operational Changes at Plant's Cooling Water Intake Structures

Item No.	Data Requested	Impingement	Entrainment
33(b)(1)	Please provide the name of the study.	_____	_____
33(b)(2)	What were the starting and ending dates of the study **(by month and year)** (e.g., 12/1995)?	Starting Date: Month____/Year____ Ending Date: Month____/Year____ Don't Know . . . . . ○(8)	Starting Date: Month____/Year____ Ending Date: Month____/Year____ Don't Know . . . . . ○(8)
33(b)(3)	What was the period of impingement and/or entrainment monitoring (if different from period of study) (e.g., 12/1995)?	Starting Date: Month____/Year____ Ending Date: Month____/Year____ Don't Know . . . . . ○(8)	Starting Date: Month____/Year____ Ending Date: Month____/Year____ Don't Know . . . . . ○(8)
33(b)(4)	Please briefly describe the type of technology and/or operational changes that were made, why they were made, and whether the changes were related to an existing CWIS. **[Please identify CWISs by using the codes established in Question 3, Section A, of the questionnaire. Separate identification codes by a comma if more than one CWIS was affected.]** ***Example:*** The study led the plant to switch from Technology "X" on CWIS #1 to Technology "Y" because Technology "Y" was found to be more effective at minimizing the impingement of Organism "X."	**Type of Changes:**(1) **Why Changes Made:**(2) **Relationship to Existing CWISs:**(3)	**Type of Changes:**(1) **Why Changes Made:**(2) **Relationship to Existing CWISs:**(3)

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ○

Most Recent (or Most Representative) Impingement and/or Entrainment Study of Technology and/or Operational Changes at Plant's Cooling Water Intake Structures

Item No.	Data Requested	Impingement	Entrainment
33(b)(5)	How many cooling water intake structures (CWISs) were covered by the study? Of this number, how many are currently operating or temporarily offline? **[Please note CWISs by using same nos. or names as in Question 3 in Section A. Separate CWISs by a comma if more than one was evaluated.]**	Total Number of CWISs Evaluated: ____(1) Don't Know . . . . . ○(8) Numbers of CWISs Studied That Are Currently Operating or Temporarily Offline: _____, _____, _____, _____ Don't Know . . . . . ○(8)	Total Number of CWISs Evaluated:____(1) Don't Know . . . . . ○(8) Numbers of CWISs Studied That Are Currently Operating or Temporarily Offline: _____, _____, _____, _____ Don't Know . . . . . ○(8)
33(b)(6)	What was the cost of the study? **[Please check (✓) whether the cost figure provided is an estimate or based on actual data.]**	Cost $_____ Actual ○(1) Estimate ○(2) No Data Available to Provide Estimate . . . . . ○(8)	Cost $_____ Actual ○(1) Estimate ○(2) No Data Available to Provide Estimate . . . . . ○(8)
33(b)(7)	Are study methodology and findings readily available for review by EPA? **[Please provide explanation of a "no" response.]**	Yes . . . . . ○(1) No *(please explain):* . . . . . ○(2)	Yes . . . . . ○(1) No *(please explain):* . . . . . ○(2)

Ongoing Monitoring Study of Impingement and/or Entrainment

34. (a) Does the plant have an ongoing monitoring program to evaluate the occurrence or rate of impingement and/or entrainment at any of its cooling water intake structures?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.35, Next Page**

(b) Complete the following matrix concerning your ongoing monitoring program.

Ongoing Monitoring Program to Evaluate the Occurrence or Rate of Impingement and/or Entrainment for the Plant's Cooling Water Intake Structures

Item No.	Data Requested	Impingement	Entrainment
34(b)(1)	How often do you monitor? **[Please check (✓) only one response per category.]**	Daily ◯(1) Monthly ◯(2) Seasonally ◯(3) Annually ◯(4) Other ***(please describe below)*** ◯(5)	Daily ◯(1) Monthly ◯(2) Seasonally ◯(3) Annually ◯(4) Other ***(please describe below)*** ◯(5)
34(b)(2)	What is the average cost of the monitoring programs? **[Please check (✓) whether your cost figure is an estimate or is actual.]**	Cost $ _____ Estimate ◯(1) Actual ◯(2) Don't Know ◯(8)	Cost $ _____ Estimate ◯(1) Actual ◯(2) Don't Know ◯(8)
34(b)(3)	Are monitoring data readily available for review? **[Please explain a "no" response in the space provided.]**	Yes ◯(1) No (***please explain below***) ◯(2)	Yes ◯(1) No (***please explain*** **below**) ◯(2)

▶ **INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION** ◯

Mitigation Activities

35. (a) Since 1980 has the plant carried out any measures to compensate for or to mitigate potential environmental impacts?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Section E, Page 61**

(b) Were any of these measures required by a Federal or state permit and/or other regulatory requirement?

◯ **Yes** (1)

◯ **No** (2)

(c) What specific measures have been carried out to compensate for or to mitigate potential environmental impacts. **[Please check (✓) all measures that apply.]**

Restocking of Fisheries . . . . . ◯ (1)

Design, Construction, and/or O&M of Hatcheries . . . . . ◯ (2)

Habitat Restoration . . . . . ◯ (3)

Designation of Conservation Areas . . . . . ◯ (4)

Other *(please describe below)*: . . . . . ◯ (5)

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Section E: Planned Cooling Water Intake Structures and Changes to Capacity

PLEASE ANSWER THE QUESTIONS IN THIS SECTION FOR *ONLY* THE PLANT'S COOLING WATER INTAKE STRUCTURES THAT ARE PLANNED OR UNDER CONSTRUCTION *and that will directly withdraw cooling water from surface water. No data are being requested on (a) cooling water intake structures that are planned, or under construction and that obtain cooling water via groundwater wells or (b) planned conduits to other providers of cooling water (e.g., local water suppliers or other plants).*

NOTES: *You should **not** report data in this section of the questionnaire for intake structures which are presently operational, temporarily offline, or permanently offline.*

*In this section of the questionnaire the term **planned** includes structures under construction but not yet operational.*

36. (a) Do you have planned modifications to your cooling water intake systems that will change the capacity of intake water collected for the plant?

- ◯ **Yes** (1)
- ◯ **No** (2) ▶ **SKIP TO Q.37**

(b) How will the planned modifications affect the cooling water intake capacity?

- ◯ **Increase** (1)
- ◯ **Decrease** (2)
- ◯ **Same** (3)

37. Does the plant presently have any ***planned*** cooling water intake structures that will directly withdraw cooling water from surface water?

- ◯ **Yes** (1)
- ◯ **No** (2) ▶ **STOP**

If answer is No, please stop here. You are finished with Part 2 of the questionnaire. Please continue to Part 3, Financial and Economic Data.

38. How many planned CWISs does the plant have that will directly withdraw surface water to support, at least in part, contact or non-contact cooling operations within the plant? _____

39. Please provide the general design data requested in the matrix below for each of the plant's planned CWISs.

Profiles of Plant's Planned Cooling Water Intake Structures (CWISs) Matrix ___ of ___

Response space has been provided for two planned CWISs. If your plant has more than this number of planned cooling water intake structures, please copy the matrix and change the CWIS code numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	Planned CWIS A	Planned CWIS B
39(a)	Plant-designated Number or Name of CWIS		
39(b)	Associated Number of Intake Bays on CWIS		
39(c)	Month and Year Planned CWIS Expected to Begin Operation (e.g., 12/1995)	_____/_____ Month / Year	_____/_____ Month / Year
39(d)	Associated Cooling Water System(s) or CWS(s) **[Please insert CWS name or number from Question 1 in Section A of the questionnaire, or indicate that the CWS is planned or under construction.]**	Associated with Existing CWS (CWS Name _____) . . . . . ○(1) Associated with Planned CWS . ○(2)	Associated with Existing CWS (CWS Name _____) . . . . . ○(1) Associated with Planned CWS . ○(2)
39(e)	Is the Planned CWIS Associated with a Recirculating CWS?	**No** . . . . . ○(1) **Yes** . . . . . ○(2) If yes, **Cooling Tower** . . . . . ○(3) **Cooling Pond** . . . . . ○(4)	**No** . . . . . ○(1) **Yes** . . . . . ○(2) If yes, **Cooling Tower** . . . . . ○(3) **Cooling Pond** . . . . . ○(4)
39(f)	Design Intake Capacity **(in GPD)** for Planned CWIS	_____ GPD(1) Don't Know . . . . . ○(8)	_____ GPD(1) Don't Know . . . . . ○(8)

Water Source Data

40. Please indicate the type of water source that will be used for each of the plant's planned cooling water intake structures, and please note the actual name of the water body.

Water Source Data for Plant's Planned Cooling Water Intake Structures (CWISs) Matrix ___ of ___

Response space has been provided for two CWISs. If your plant has more than this number of planned intake structures, please copy the matrix and change the CWIS code numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Item No.	Data Requested	Planned CWIS_____ [Please insert same no. or name as Question 39 in Section E]	Planned CWIS_____ [Please insert same no. or name as Question 39 in Section E.]
40(a)	Type of Water Source **[Please check (✓) all applicable sources per CWIS.]** **NOTE:** *If cooling water will be withdrawn from a channel, canal, reservoir, constructed bay or cove, or other manmade impoundment, please indicate the **originating** source of the water.*	Lake or Pond *(natural)* . . . . . ○(1) Non-tidal River or Stream . . . . . ○(2) Tidal River . . . . . ○(3) Estuary . . . . . ○(4) Ocean . . . . . ○(5) Bay or Cove *(natural, saline water)* . ○(6) Bay or Cove *(natural, fresh water)* . ○(7)	Lake or Pond *(natural)* . . . . . ○(1) Non-tidal River or Stream . . . . . ○(2) Tidal River . . . . . ○(3) Estuary . . . . . ○(4) Ocean . . . . . ○(5) Bay or Cove *(natural, saline water)* ○(6) Bay or Cove *(natural, fresh water)* ○(7)
40(b)	Name of Water Body		

Cooling Water Intake Structure Technologies

41. (a) Will you employ traveling or other intake screens, passive intake systems, fish diversion or avoidance systems, or fish handling and/or return systems at any of the plant's planned CWISs?

◯ **Yes** (1)

◯ **No** (2) ▶ **SKIP TO Q.42, Page 65**

(b) For each planned CWIS, please indicate in the matrix below all the systems that will be employed.

Planned CWIS_____ [Please insert same no. or name as under Item 39, page 62.] Matrix ___ of ___

Planned System Technologies **[Please check (✓) all technologies that apply per CWIS.]**

Response space has been provided for one planned cooling water intake structure (CWIS). If your plant has more than this number of planned CWISs, please copy the matrix and change the CWIS code names or numbers as appropriate. Insert any additional matrices into this section of the questionnaire, and identify individual matrix sheets as Matrix "1 of 3," "2 of 3," etc.

Traveling or Other Intake Screen System Technologies		Fish Diversion or Avoidance System Technologies	
Horizontal Drum	◯(1)	Velocity Cap	◯(19)
Vertical Drum	◯(2)	Louver Barrier	◯(20)
Rotating Disk	◯(3)	Water Jet Barrier	◯(21)
Fixed	◯(4)	Fish Net Barrier	◯(22)
Vertical Single Entry/Exit Traveling	◯(5)	Air Bubble Barrier	◯(23)
Modified Vertical Single Entry/Exit Traveling (Ristroph)	◯(6)	Electrical Barrier	◯(24)
Incline Single Entry/Exit Traveling	◯(7)	Light Barrier	◯(25)
Single Entry/Double Exit Traveling (Center Flow)	◯(10)	Sound Barrier	◯(26)
Double Entry/Single Exit Traveling (Dual Flow)	◯(11)	Cable or Chain Barrier	◯(27)
Horizontal Traveling	◯(12)	Other (please describe):	◯(28)
Other (please describe):	◯(13)	**Passive Intake System Technologies**	
Fish Handling and/or Return System Technologies		Wedge-Wire Screen	◯(29)
Fish Pump	◯(14)	Perforated Pipe	◯(30)
Fish Conveyance System (Troughs or Pipes)	◯(15)	Porous Dike	◯(31)
Fish Elevator/Lift Baskets	◯(16)	Leaky Dam	◯(32)
Fish Bypass System	◯(17)	Artificial Filter Bed	◯(33)
Fish Holding Tank	◯(18)	Other (please describe):	◯(34)

Section 316(b)-Related Studies

42. Has your plant performed (or does your plant expect to perform) any studies to demonstrate that the location, design, construction, and capacity of one or more of its planned cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts?

◯ **Yes** (1)

◯ **No** (2)

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Part 3: Economic and Financial Data

Detailed Industry Questionnaire:
Phase II Cooling Water Intake Structures

Traditional Steam Electric Utilities

January 2000

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Section A: General Information About the Plant

▶ *Several questions in this part of the questionnaire request information about your "reporting years" 1996, 1997, and 1998. These time periods should be the same as the periods for which your utility reports information on **FERC Form 1**, **Form EIA-412**, or **RUS Form-12**. Document I, Question 3 of this questionnaire requests identification of these time periods. If you are unsure about your utility's reporting year, you should contact your utility headquarters for assistance.*

NOTE: *Section A requests general information about your plant. Some of the data asked about your plant may not be kept on your plant's premises. You may need to contact your utility's headquarters for help in completing this and the following section.*

1. (a) Please indicate the identification code of this plant as used when submitting reports to the ***Energy Information Administration (EIA)***.

EIA Plant Identification Code:_____
[○ Check (✓) here if none.]

(b) Please indicate the identification code of this plant as used when reporting to the ***Rural Utilities Service (RUS)***.

RUS Plant Identification Code:_____
[○ Check (✓) here if none.]

(c) Please indicate the ***DUNS number*** for this plant.

DUNS Number:_____
[○ Check (✓) here if none.]

2. Please provide the following information about the person who will serve as a contact for questions about your plant's responses to *Part 3: Economic and Financial Data*. [**NOTE:** *The plant contact person should be the person most knowledgeable about the information requested in this part of the survey. This person is not required to be the certifying official.]*

Name of Plant Contact Person:_____ (1)

Title of Plant Contact Person:_____ (2)

Employer *(full legal name)***:** _____ (3)

Phone: ( )_____ (4a) **Fax:** ( )_____ (4b)

Mailing Address/PO Box: _____ (5)

City, State, ZIP Code: _____ (6)

Best Time to Contact: _____ (7)

Part 3: Economic and Financial Data

3. (a) During reporting year 1998, did the plant engage in economic activities *other than the generation of electricity*?

○ **Yes** (1)

○ **No** (2) ▶ **SKIP TO Q.4**

NOTE: *Activities may include, but are not limited to, production activities, the sale of steam, coal or ash, waste combustion, or the leasing of land. Please include only those economic activities that are carried out by the plant's owner; do not include activities carried out on the plant's property by third parties.*

(b) In the table below, please provide:

(1) a brief description of each of the plant's economic activities *other than the generation of electricity* **[If your plant engages in more than four such activities, please only list the four activities that you consider most important economically]**;

(2) the EIA identification numbers of the units that were associated with each activity (if an activity was not associated with any of the ***generating units***, please list "none;" alternatively, if an activity was associated with all of the generating units, you may list "all");

(3) whether the activity used cooling water during reporting year 1998;

(4) the names or numbers of the cooling water intake structures that were associated with each activity (if an activity was not associated with a cooling water intake structures, please list "none").

NOTE: *When completing column (4) of this question, please use the same name or number to identify each cooling water intake structure as was used in* ***Question 3 of Part 2: Technical Data*** *of this questionnaire. For example, the cooling water intake structure designated as "CWIS A" in Question 3 of Part 2 should also be identified as "CWIS A" in this question.*

Other Economic Activities

Item No.	(1) Economic Activity	(2) Associated with Unit #(s)	(3) Was Cooling Water Used?		(4) Associated with CWIS #(s)
3(b)(1)	(1)	(2)	○ Yes (3a)	○ No (3b)	(4)
3(b)(2)	(1)	(2)	○ Yes (3a)	○ No (3b)	(4)
3(b)(3)	(1)	(2)	○ Yes (3a)	○ No (3b)	(4)
3(b)(4)	(1)	(2)	○ Yes (3a)	○ No (3b)	(4)

(c) What were the ***revenues***, if any, and costs in reporting year 1998 associated with each of the economic activities listed in Q.3.b?

NOTE: *You may estimate the amounts requested in this question if actual data are not available. Column (2): Please list only those costs that are incurred in addition to the costs of generating electricity.*

Revenues and Costs Associated with Other Economic Activities

Item No.	(1) 1998 Revenues	(2) 1998 Costs
3(c)(1)	$ (1)	$ (2)
3(c)(2)	$ (1)	$ (2)
3(c)(3)	$ (1)	$ (2)
3(c)(4)	$ (1)	$ (2)

4. Is this plant operated by a utility that is classified as a ***rural electric cooperative***?

○ **Yes** (1)

○ **No** (2) ▶ **SKIP TO Q.6**

DEFINITION

For the purposes of this questionnaire, **rural electric cooperatives** are electric utilities that are owned by their members and are established to provide electricity to those members. Cooperatives are incorporated under State law and are generally exempt from Federal income tax laws. Most electric cooperatives have been initially financed by the Rural Utilities Service, U.S. Department of Agriculture.

5. Please complete the following table for reporting years 1996, 1997, and 1998. Please report the **book value** for the line items requested. *If this plant is partly owned by other entities besides your utility, provide data for the entire plant, not only the share owned by your utility.*

Plant-Level Balance Sheet Information (Report monetary values in whole dollars.)

		Reporting Year:		
		1996	**1997**	**1998**
5(a)	**Land and Land Rights**	$ (1)	$ (2)	$ (3)
5(b)	**Structures, Improvements and Equipment Costs** (original costs)	$ (1)	$ (2)	$ (3)
5(c)	**TOTAL COST OF PLANT:** Add **5. a and b**	$ (1)	$ (2)	$ (3)
5(d)	**COST PER KW OF INSTALLED CAPACITY**	$ (1)	$ (2)	$ (3)

Section B: Information for Steam Electric Generating Units

*Please provide information only for those steam electric units that are operating, available to operate, on scheduled or forced outage, on cold **standby**, or that were sold to a nonutility but are still operated by the plant. (Do not provide information for retired units.)*

*If your plant has more than one such **steam electric generating unit,** you will need to copy this section (pages 5 and 6) to accommodate data for all of the plant's units. If you submit more than one copy of this section, please indicate in the space at the top right corner of each copy the copy number and the total number of copies you will submit (e.g., Copy 1 of 4, Copy 2 of 4, etc.).*

NOTE:** This section asks for information about steam electric generating units located at the plant **as of December 31, 1998**. Please also include information on steam electric generators that are part of a **combined-cycle unit.

6. (a) Indicate the identification code(s) of the generator(s) associated with this generating unit as used when reporting to the EIA on Forms EIA-767 and EIA-860. ***(See Form EIA-860, Schedule III, Section A, Item 1.b)***

EIA Generator Identification Code(s):_____

(b) Since January 1, 1996, has this generating unit used cooling water directly withdrawn from surface water by your plant?

○ **Yes** (1)
○ **No** (2)

You do not have to provide any further information for this generating unit. Please refer to the instructions on page iv after you have completed Section B for each steam electric unit operated by this plant.

7. Indicate the planned retirement date for this steam electric generating unit. **[Indicate the month, if known, and the year (e.g., 01/1995).]**

_____/_____
month year

[○ Check (✓) here if no retirement date has been determined.]

8. Please list all cooling water intake structures that are associated with this steam electric generating unit.

NOTE: *When completing this question, please use the same name or number to identify each cooling water intake structure as was used in* ***Question 3 of Part 2: Technical Data*** *of this questionnaire. For example, the cooling water intake structure designated as "CWIS A" in Question 3, Part 2 should also be identified as "CWIS A" in this question.*

Cooling Water Intake Structures Associated with This Unit:		
○ **CWIS** _____ (1)	○ **CWIS** _____(2)	○ **CWIS** _____(3)

9. Please complete the following table for reporting years 1996, 1997, and 1998 for this steam electric generating unit. **[If this generating unit is owned by other entities besides this utility, please provide data for the entire generating unit, not only the share owned by this utility.]**

		Reporting Year		
		1996	**1997**	**1998**
9(a)	***Net Electricity Generation***, Exclusive of Plant Use **(in megawatt hours)**	MWh (1)	MWh (2)	MWh (3)
9(b)	Number of Hours in Operation in each Year	hours (1)	hours (2)	hours (3)
9(c)	***Net Peak Demand*** on Unit — MW (60 minutes)	MW (1)	MW (2)	MW (3)
9(d)	Quantity (Units) of Fuel Burned **(Coal-tons of 2,000 lbs; Oil-barrels of 42 gals.; Gas-Mcf; Nuclear or Other-indicate)**	Coal: (1a)	Coal: (2a)	Coal: (3a)
		Oil: (1b)	Oil: (2b)	Oil: (3b)
		Gas: (1c)	Gas: (2c)	Gas: (3c)
		Nuclear: (1d)	Nuclear: (2d)	Nuclear: (3d)
		Other: (1e)	Other: (2e)	Other: (3e)
9(e)	Average Cost of Fuel **per Unit of Fuel Burned**	Coal: $ (1a)	Coal: $ (2a)	Coal: $ (3a)
		Oil: $ (1b)	Oil: $ (2b)	Oil: $ (3b)
		Gas: $ (1c)	Gas: $ (2c)	Gas: $ (3c)
		Nuclear: $ (1d)	Nuclear: $ (2d)	Nuclear: $ (3d)
		Other: $ (1e)	Other: $ (2e)	Other: $ (3e)

PLEASE STOP HERE. YOU ARE FINISHED WITH THE DETAILED INDUSTRY QUESTIONNAIRE: PHASE II COOLING WATER INTAKE STRUCTURES. PLEASE REMEMBER TO RETURN YOUR QUESTIONNAIRE PACKAGE WITH A COMPLETED CERTIFICATION STATEMENT. THANK YOU.

Glossary to Questionnaire

NOTE: *The following terms are defined for purposes of this questionnaire only. The definitions at present do not have any legal meaning with respect to Section 316(b) of the Clean Water Act.*

7Q10 Value: The lowest average 7 consecutive day low flow with an average recurrence frequency of once in 10 years determined hydrologically.

Air Conditioning: The process and equipment used to control the temperature and humidity of indoor air. Cooling water is used in some types of air conditioning systems.

Annual Average Flow (in Million Gallons per Day): The total flow calculated by summing actual daily flows (in million gallons) and dividing by 365 days.

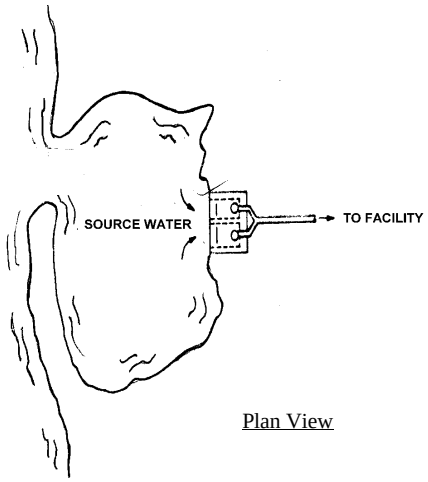
Annual Cooling Water Intake Flow Rate: The total volume of cooling water withdrawn by a specific intake structure per calender year.

Average Daily Intake Flow: The total volume of cooling water withdrawn by a specific intake structure over a 24-hour day.

Bar Rack/Trash Rack: A device consisting of parallel spaced bars placed at or near the opening of an intake structure to mechanically stop debris and /or large organisms from entering a facility's water system.

Bay or Cove *(natural or constructed)*: An inlet created when the shoreline of a water body is indented. Bays are generally larger than coves but are smaller than gulfs. Coves are generally sheltered. Bays and coves are considered part of the cooling water intake structure. [**NOTE**: *The Chesapeake Bay and the San Francisco Bay are examples of estuaries even though the term* ***bay*** *appears in their name.*] ***See Figure 1 for a graphical view of an intake structure incorporating a bay or cove.***

Figure 1. Example of an Intake Structure Incorporating a Bay or Cove



Plan View

Combined-Cycle Unit: An electric generating unit that consists of one or more gas turbines or internal combustion engines and one or more steam boilers. Part of the required input to the boiler(s) is provided by the exhaust gas (waste heat) of the combustion turbine(s).

Confluence of Tributaries: The point of juncture of two or more tributaries.

Contact Cooling Water: Cooling water that directly meets any raw material, intermediate product, finished product, by-product, or water product as part of a plant's operation.

Conservation Pool: Measures of the minimum depth of water needed in a reservoir to ensure proper performance of the system relying upon the reservoir. Conservation pools are measurements of the elevation of the water in relation to the elevation of the dam.

Cooling Canal/Channel: An artificial, channelized waterway used to transfer heat added to water from operations within a plant to the atmosphere.

Cooling Lake: A body of water that is formed by the construction of a dam, berm, or levee in a natural watershed and which relies on the banks of the natural watershed to provide the majority of the containment of the impounded water. A cooling lake is a means for transferring to the atmosphere heat added to water by facility operations.

Cooling Operations: Activities that transfer heat from one medium or activity to cooling water (with the exception of nonprocess air conditioning).

Cooling Pond: A body of water that is formed by the construction of a dam, berm, or levee on land, has no significant watershed, and which requires the manmade containment surround most or all of the impounded water. A cooling pond is a means for transferring to the atmosphere heat added to water by facility operations.

Cooling Tower: A structure which functions as a heat exchanger and is designed to provide cooling by the forced evaporation of water into an air stream using either mechanical energy (forced draft) or ambient buoyancy (natural draft) to provide the movement of the air stream through the tower.

Cooling Water: Refers to both contact and non-contact cooling water, including water used for air conditioning, equipment cooling, evaporative cooling tower makeup, and dilution of effluent heat content. The intended use of the cooling water is to absorb waste heat rejected from the process or processes employed or from auxiliary operations on the plant's premises.

Cooling Water Discharge Outfall: The total structure used to direct water that has been used for contact and non-contact cooling purposes within a facility into Waters of the United States.

Cooling Water Intake Flow Rate: The total volume of cooling water withdrawn by a specific intake structure over a specific time-period.

Cooling Water Intake Structure: The total structure used to withdraw water from a water source up to the point of the first intake pump or series of pumps. The intended use of the cooling water is to adsorb waste heat rejected from processes employed or from auxiliary operations on the plant's premises. Single cooling water intake structures may have multiple intake bays and could serve more than one generating unit. If a plant has intake structures may withdraw water for purposes besides cooling, the entire intake structure should be considered a cooling water intake structure under the questionnaire.

Cooling Water System: A system that provides water to/from a plant to transfer heat from equipment or processes therein. The system includes, but is not limited to, water intake and outlet structures, cooling towers, ponds, pumps, pipes, and canals/channels. For plants that use surface water for cooling, a system begins at the first barrier(s) to ingress and/or egress by fish and other aquatic wildlife (e.g., at the weir wall, at the trash rack, etc.) and ends at the discharge outlet(s). ***See also Cooling Water Intake Structure.***

Cove: *See* **Bay**.

Critical Aquatic Habitat: Biological or physical features of an area that are essential for the conservation and preservation of aquatic threatened or endangered species and may require special management considerations or protection.

Daily Maximum Flow: The maximum flow recorded for any one day during a given month.

Daily Minimum Flow: The minimum flow recorded for any one day during a given month.

Design Through-Screen Velocity: The value assigned during the design phase of a CWIS to the speed at which intake water passes through the intake screen (or other technology) against which organisms may be impinged or where they may be entrained.

Discharge: When used without qualification, means the discharge of a pollutant. Discharge of a pollutant means: (i) any discharge of any pollutant or combination of pollutants to waters of the United States from any point source, or (ii) any addition of any pollutant or combination of pollutants to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. ***See also 40 CFR 122.2.***

Discrete Biological Study of Entrainment: A study that has been distinctly undertaken to evaluate the biological effects of entrainment over a specified time period. The study has discrete starting and ending points. The purpose of the study is to evaluate the rate and/or number of organisms withdrawn from the intake water body and into the cooling water flow and thus, into a cooling water system. The study may involve evaluations of one or more intake structures.

Discrete Biological Study of Impingement: A study that has been distinctly undertaken to evaluate the biological effects of impingement over a specified time period. The study has discrete starting and ending points. The purpose of the study is to evaluate the rate and/or number of organisms are trapped against the outer part of one or more intake structures during periods of cooling water withdrawal.

Domestic Parent Firm: The highest level domestic business entity in a facility's organizational structure. A firm owned by another U.S. firm is *not* a domestic parent firm. On the contrary, a U.S. firm owned by a foreign firm *is* a domestic parent firm.

DUNS Number: A number assigned to a business using the Data Universal Numbering System (DUNS) developed by the Dun and Bradstreet Corporation.

Effluent: Outflow of wastewater from a plant to waters of the United States.

Electric Utility: Any corporation, person, agency, authority, or other legal entity or instrumentality that owns and/or operates facilities within the United States, its territories, or Puerto Rico for the generation, transmission, distribution, or sale of electric energy primarily for use by the public and files forms listed in the *Code of Federal Regulations*, Title 18, Part 141. Facilities that qualify as cogenerators or small power producers under the Public Utility Regulatory Policies Act (PURPA) are not considered electric utilities.

Energy Information Administration (EIA): The independent statistical and analytical agency within the U.S. Department of Energy (DOE). In support of its analytic activities, the EIA administers a series of data collection efforts including Forms EIA-412, EIA-767, EIA-860, and EIA-861.

Entrainment: The merging of small aquatic organisms with the flow of cooling water entering and passing through a cooling water intake structure, and, thus, into a cooling water system.

Environmental Impact: Human induced change or pressure on the natural environment.

Estuary: A semi-enclosed coastal body of water that has a free connection with the open sea and is strongly affected by tidal action. In an estuary, sea water is mixed (and usually measurably diluted) with fresh water from land drainage. [**NOTE**: *The Chesapeake Bay and the San Francisco Bay are examples of estuaries even though the term* ***bay*** *appears in their name. For the purposes of this questionnaire, the term "tidal river" means the seaward most reach of a river/stream where the salinity is ≤ 0.5 ppt at a time of annual low flow its surface elevation responds to the effects of coastal lunar tides. Where the river salinity exceeds 0.5 ppt, the respective river reach will be viewed as estuarine.*]

Existing Generating Unit: Units in operation, on standby, on cold standby, on test, in maintenance and repair, out of service (all year), or on indefinite shutdown. Existing generation units do not include retired or planned units.

Far-field: The area of a water body, from which cooling water is obtained, where the water velocity and/or salinity/density is primarily influenced by ambient water conditions and where the cooling water intake is shown to have minimal effect.

Federal Energy Regulatory Commission (FERC): A quasi-independent regulatory agency within the Department of Energy having jurisdiction over interstate electricity sales, wholesale electric rates, hydro-licensing, natural gas pricing, oil pipeline rates, and gas pipeline certification.

FERC Form 1: The annual report of major electric utilities, licensees and others administered by the Federal Energy Regulatory Commission (FERC). Utilities having, in each of three previous years, sales

or transmission services that exceed one of the following must submit the FERC Form 1: (1) One million megawatt hours of total annual sales; (2) 100 megawatt hours of annual sales for resale; (3) 500 megawatt hours of annual power exchanges delivered; or (4) 500 megawatt hours of annual wheeling for others (deliveries plus losses).

Firm Power: Power or power-producing capacity intended to be available at all times during the period covered by a guaranteed commitment to deliver, even under adverse conditions.

First Mortgage Bond: A secured debt security that has as collateral an asset or assets that have not previously been mortgaged.

Fish and Shellfish Spawning and Nursery Area: A region selected by invertebrate and vertebrate aquatic organisms for depositing eggs and for development of larval, post larval, and juvenile life stages. Aquatic organisms may spawn their eggs directly into the water column (broadcast and pelagic spawners) or attach eggs to hard- or soft-bottom substrate, including prepared nests (demersal or benthic spawners).

Fish Diversion or Avoidance System: Mechanisms designed to divert or induce fish to swim away from cooling water intake structures.

Fish Handling and/or Return System: Any system that collects, and/or transports live organisms from an intake structure back to the source water body at a point away from the influence of the intake.

Form EIA-412: The annual report of public electric utilities administered by the Energy Information Administration.

Full-Time Equivalent Employee (FTE): The normalized unit for counting employees at a facility. One FTE equals 2,000 hours of work (8 hours per day for 250 days) during a calendar year. As such, two part-time employees, each working 1,000 hours per year, would be counted together as one FTE.

Generating Unit: A combination of physically connected generator(s), reactor(s), boiler(s), combustion turbine(s), or other prime mover(s) operated together to produce electric power.

Gross Electricity Generation: The total amount of electric energy produced by the generating units of a given plant or nonutility.

Groundwater: Water found beneath the earth's surface. It is usually held in aquifers and is often the source of water for wells and streams.

Highest Level of Domestic Business Entity: An organizational concept used to define the ownership structure of an electric utility. A firm owned by another U.S. firm is *not* the highest level of domestic business entity. On the contrary, a U.S. firm owned by a foreign firm *is* the highest level of domestic business entity.

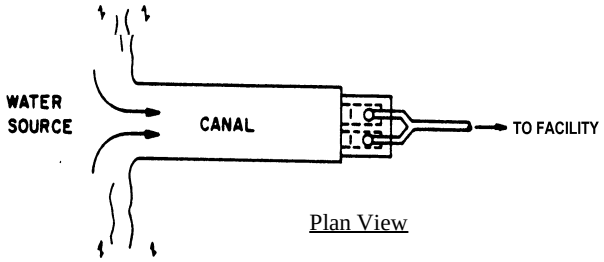
Horizontal Merger: The combination or consolidation of two or more electric utilities or other firms into one business entity. The merged entity may carry the name of one of the original entities or may receive a new name.

Impingement: The trapping and holding of larger aquatic organisms to the outer part of an intake structure or against screening devices during periods of cooling water withdrawal.

Intake Bays: Temporary holding areas designed to direct water toward the pump well of a specific intake structure.

Intake Canal/Channel *(natural or constructed)*: A channelized conduit that diverts water before its passage through screens or other filtering devices and before its entrance into an intake structure. ***See Figure 2 for a graphical view of an intake structure employing an intake canal.***

Figure 2. Example of an Intake Structure Employing an Intake Canal



Plan View

Intake Structure: ***See Cooling Water Intake Structure.***

Kilowatt-hour: One thousand watt hours. A watt hour is a unit of work or energy equivalent to the power of one watt operating for one hour.

Lake: A natural water body or an impounded stream, usually fresh, surrounded by land or by land and a man-made retainer (e.g., a dam). Lakes may be fed by rivers, streams, springs, and/or local precipitation.

Latitude: The angular distance north or south of the equator measured in degrees or in hours, minutes, and seconds along a meridian.

Local Water Supplier: An entity whose primary business objective is to provide potable water from surface water and/or groundwater to year-round residents. In some instances, such suppliers may sell nonpotable water (or water not meeting public health standards) to industrial and other facilities. Local water suppliers can be privately and/or publicly-owned and operated.

Long-Term Firm Purchases of Power: Electricity purchase agreements that cannot unilaterally be discontinued between now and January 1, 2003 and that do not terminate before January 1, 2003. ***See also Firm Power.***

Long-Term Firm Sales for Resale: Electricity sales for resale agreements that cannot unilaterally be discontinued between now and January 1, 2003 and that do not terminate before January 1, 2003. ***See also Firm Power.***

Longitude: The angular distance on the earth east or west of the prime meridian, expressed in degrees or in hours, minutes, and seconds.

Major Electric Utility: Utilities having, in each of three previous years, sales or transmission services that exceed one of the following must submit the FERC Form 1: (1) One million megawatt hours of total annual sales; (2) 100 megawatt hours of annual sales for resale; (3) 500 megawatt hours of annual power exchanges delivered; or (4) 500 megawatt hours of annual wheeling for others (deliveries plus losses).

Makeup Water: "New water" intended to replace water lost to evaporation, blowdown, and drift in a recirculating cooling water system. ***See New Water.***

Mean Annual Flow: The average of daily flows over a calendar year.

Mean High Water Level: The average height of the high water over at least 19 years.

Mean Low Water Level: The average height of the low water over at least 19 years.

Mean Tidal Volume: An average of the volume of water entering and leaving an estuary or tidal river as the water level fluctuates because of the tides.

Mean Water Level: A plane midway between mean high water and mean low water.

Migratory Routes: Route taken by aquatic populations during seasonal movement from one region to another.

Monthly Average Flows: An average flow calculated by summing all of the actual or calculate daily flows during a particular month and dividing that sum by the total number of calendar days in the month.

Natural Draft Cooling Tower: A cooling water tower that has no mechanical device to create airflow through the tower. Usually applied in very small or very large applications.

National Geodetic Vertical Datum (NGVD): Commonly referred to as mean sea level. Established by the National Geodetic Survey, NGVD are the permanent landmarks of known position and elevation throughout the United States from which elevations can be surveyed. The location of the nearest benchmark can be obtained by contacting either the local or national U.S.G.S. office.

Near-Field: Area of the intake water body where velocity and/or salinity/density become affected by the removal of water.

Net Electricity Generation: Gross electricity generation minus plant use from all electric utility owned plants. The energy required for pumping at a pumped-storage plant is regarded as plant use and must be deducted from the gross generation.

Net Peak Demand: The maximum load during a specified period of time, net of plant use.

New Water: Water that the plant directly withdraws from a water source through an intake structure or water received from another entity. New water does not include water that is recirculated or recycled within the plant.

Non-contact Cooling Water: Cooling water that does **not** come into contact with any raw materials, intermediate products, finished products, by-products, or waste products.

Non-recirculating Canals/Channels, Lakes, or Ponds: Cooling structures used in conjunction with a once through cooling water system that treats, all or a portion of the cooling water discharge from a plant.

Non-recirculating Cooling Towers: Cooling towers used in conjunction with a once through cooling water system that treats, all or a portion of the cooling water discharge from a plant.

Non-tidal Rivers/Streams: Rivers or streams which do not receive significant inflows of water from oceans or bays due to tidal action.

Nonutility Power Producer: A corporation, person, agency, authority, or other legal entity or instrumentality that owns electric generating capacity and is not an electric utility. Nonutility power producers include FERC Qualifying Cogenerators, FERC Qualifying Small Power Producers, and Other Nonutility Generators (including Independent Power Producers) without a designated franchised service area and which do not file forms listed in the *Code of Federal Regulations*, Title 18, Part 141.

North American Industrial Classification System: A new system initiated in January 1997 to classify industries. This new system replaces the existing Standard Industrial Code (SIC) system and identifies industries according to the type of production activities performed. NAICS industries are identified using a 6-digit code.

NPDES (National Pollutant Discharge Elimination System) Permit: A permit required to be held under Section 402 of the Clean Water Act (33 U.S.C. 1342 *et seq*.) by any point source discharging pollutants to waters of the United States. Permits may address effluent discharges, storm water, or sewage sludge management practices and may be issued by an EPA Region or a Federally-approved State NPDES program.

Ocean: Marine open coastal waters other than those water bodies classified as estuaries, embayments or fjords, each of which are semi-enclosed and have readily identifiable geographic boundaries.

Once-through Cooling Water System: A system designed to withdraw water from a natural or other water source, run it through a plant for contact and/or non-contact cooling purposes, and then discharge

it to a water body without recirculation. Once-through cooling water systems may use canals/channels, ponds, or non-recirculating towers to dissipate waste heat from the water before it is discharged.

Open Area: The wetted area (in square feet) of the opening to the cooling water intake structure minus the area (in square feet) of any structural members associated with technologies located at the intake opening.

Operating Hours: The total number of hours the cooling water intake structure was operating (taking in water) excluding any hours when the cooling water intake structure was down for routine maintenance or not operational for other reasons.

Outage: The period during which a generating unit, transmission line, or other facility is out of service.

Passive Intake System: Devices placed at or near the opening of an intake structure that, with little or no mechanical activity, stops debris and/or organisms from entering a plant's water system. Most passive intake systems achieve very low withdrawal velocities at the screening medium.

Planned or Under Construction: Cooling water intake structures for which funds have been authorized and are expected to go into commercial service within the next 7 years. It does *not* include structures that are presently operational, temporarily offline, permanently offline, or operating under test conditions.

Plant: A facility at which are located prime movers, electric generators, and auxiliary equipment for converting mechanical, chemical, and/or nuclear energy into electric energy. A plant may contain more than one type of prime mover. Electric utility plants exclude facilities that satisfy the definition of a qualifying facility under the Public Utility Regulatory Policies Act of 1978.

Plant's Own Groundwater Supply: A plant is considered as having its own groundwater supply when it owns and operates its own onsite well or directly withdraws water from other groundwater sources. The plant may treat the water, depending on its intended uses. Moreover, the plant may sell the water to other parties and/or use it onsite. The plant, however, would not provide potable water to residential populations like a local water supplier.

Plant's Own Surface Water Supply: Water from ponds and reservoirs contained within the plant's boundary.

Point Source: Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. The term does not include return flows from irrigated agriculture or agricultural storm water run off. ***See also 40 CFR 122.2.***

Pond, Natural: A still body of water that is generally smaller than a lake.

Power: The rate at which energy is transferred. Electrical energy is usually measured in watts.

Power Exchanges: Transactions involving a balancing of debits and credits for energy, capacity, etc.

Power Purchases: Electric energy bought from a utility or non-utility power provider.

Prime Mover: The engine, turbine, water wheel, or similar machine that drives an electric generator. It can also be a device that directly converts energy to electricity such as a photovoltaic solar cell or a fuel cell.

Privately-Owned Treatment Works: A treatment works that is not publicly owned and whose owner is not the operator of the works. The term includes any device and system used to handle and/or treat liquid wastes.

Process Operations: Industrial activities that directly result in the production of a plant's primary output.

Protected Aquatic Sanctuaries: Aquatic areas formally established by federal or state governments to protect and conserve aquatic natural resources and habitat.

Public Electric Utility: Nonprofit, governmental-chartered entity established to generate, transmit, and/or distribute electricity to wholesale or retail customers.

Publicly-Owned Treatment Works: A treatment works owned by the State or municipality. The term refers to any devices and systems used to store, treat, recycle, and reclaim municipal sewage or industrial wastes of a liquid nature. It also refers to sewers, pipes, and other conveyances only if they convey wastewater to a POTW treatment plant.

Rate of Return on Capital: The profits realized by a utility as a percentage of capital outlays made by that utility. Under utility regulation, the rate of return is subject to approval by the regulatory jurisdiction(s) under which the utility operates.

Recirculating Cooling Water System: A system designed to withdraw water from a natural or other water source to support contact and non-contact cooling uses within a plant. The water is generally sent to a cooling canal/channel, lake, pond, or tower in order for waste heat to be dissipated. (Some facilities may divert the "waste heat" to other process operations.) Once accomplished, the water is returned to the system. New source water (called make-up water) is added to the system to replenish losses due to blowdown, drift, and evaporation. For the purposes of the questionnaire, the term does not include non-recirculating cooling canals/channels, ponds, or towers.

Reefs: An aggregation of rocks or corals at or near the surface of water.

Reservoir: A natural or constructed basin where water is collected and stored and from where it is piped for various uses.

Revenues: The total amount of money received by a firm from sales of its products and/or services, gains from the sales or exchange of assets, interest and dividends earned on investments, and other increases in the owner's equity except those arising from capital adjustments.

Rural Electric Cooperative: An electric utility legally established to be owned by and operated for the benefit of those using its service. The utility company will generate, transmit, and/or distribute supplies of electric energy to a specified area not being serviced by another utility. Such ventures are generally exempt from Federal income tax laws. Most electric cooperatives have been initially financed by the Rural Utilities Service, U.S. Department of Agriculture.

Rural Utilities Service (RUS): Formerly the Rural Electrification Administration, the Rural Utilities Service in the Department of Agriculture was established in 1936 with the purpose of extending credit to cooperatives to provide electric service to small rural communities and farms.

RUS Form 12: The annual report of rural electric cooperatives administered by the Rural Utilities Service (RUS). Rural electric cooperatives that generate electricity and that have borrowed money from the RUS are required to file the RUS Form 12.

Sales for Resale: Energy supplied to other electric utilities, cooperatives, municipalities, and Federal and State electric agencies for resale to ultimate consumers.

Securities Rating Agency: An agency rating securities such as bonds, stocks, commercial papers and other obligations. Examples of securities rating agencies include, but are not limited to, Moody's, Standard & Poor, and Duff & Phelps.

Shoreline Intake Structure: An intake structure where the opening is closely aligned with the shoreline.

Skimmer/Curtain/or Baffle Wall: A vertical wall at the entrance to a screen or intake structure extending from above to some point below the water surface. Skimmer/curtain/or baffle walls function to direct colder waters from below the surface into the cooling water intake structure. *See Figure 3 for example of skimmer wall.*

Standard Industrial Classification (SIC) Code: A national classification system that organizes business entities into production-based and market-based categories identified by a 4-digit code. There are three levels of SIC codes: primary, secondary, and tertiary. Primary SIC codes are assigned based on the principal product or group of products produced or distributed by an establishment or for services rendered by the plant. Additional SIC codes are assigned for any secondary and tertiary products produced or for services rendered by an establishment.

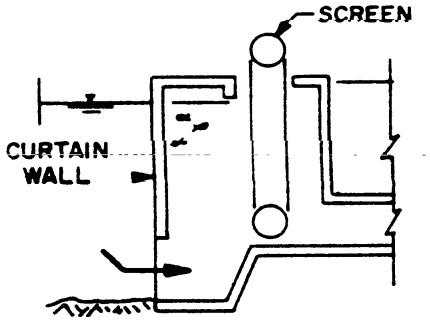
Standby: Operating status of a plant or generating unit that is generally running under no-load but that is available to replace or supplement a plant or unit normally in service.

Steam-Electric Generating Unit: A generating unit in which the prime mover is a steam turbine. The turbines convert thermal energy (steam or hot water) produced by generators or boilers to mechanical

energy or shaft torque. This mechanical energy is used to power electric generators, which convert the mechanical energy to electricity, including combined cycle electric generating units.

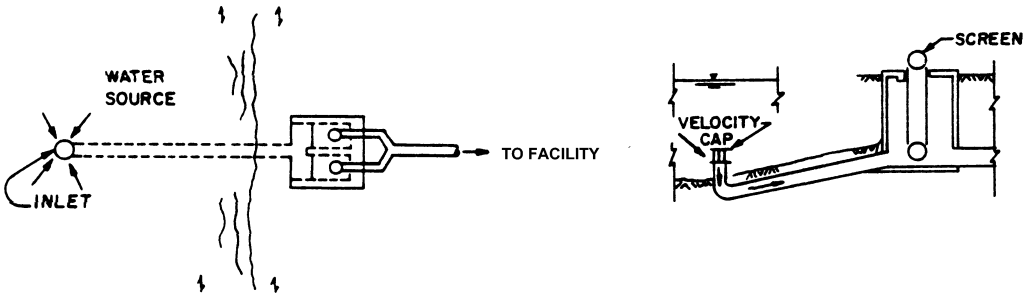
Submerged Intake Structure Flush with the Shoreline: An intake structure where the opening is evenly aligned with the shoreline and that always draws water from substantially below the surface of the water body. ***See Figure 3 for a graphical view of a submerged intake structure flush with the shoreline.***

Figure 3. Cross Section Example of a Submerged Intake Structure Flush With Shoreline



Submerged Offshore Intake Structure: An intake structure which extends from a plant outward into a water body. The intake opening is submerged and the water is always withdrawn from below the surface of the water body. ***See Figure 4 for a graphical view of a submerged offshore intake structure.***

Figure 4. Example of a Submerged Offshore Intake Structure

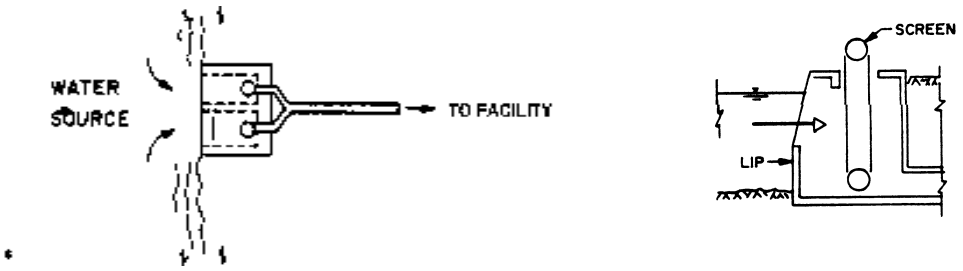


Plan View Cross Section

Submerged Vegetation: Vascular plants that are of significant ecological value because they provide prime habitat for aquatic species, and that live and grow completely under the surface, except that some species have flowers that may appear temporarily above the water.

Surface Intake Structure Flush with the Shoreline: An intake structure flush with the shoreline which withdraws water from or near the surface of the water body. ***See Figure 5 for a graphical view of a surface intake structure flush with the shoreline.***

Figure 5. Example of a Surface Intake Structure Flush with Shoreline



Plan View Cross Section

Surface Water: Bodies of water including lakes, ponds, or reservoirs; non-tidal rivers or streams; tidal rivers; estuaries; fjords; oceans; and bays/coves.

Temporarily Offline: Cooling water systems that are presently out of commercial service but are expected to return. The category includes systems on inactive reserve and systems deactivated (i.e., systems not normally used but available for service).

Tidal Rivers: Rivers which receive regular, significant inflows of water from oceans or bays due to tidal action.[**NOTE**: *For the purposes of this questionnaire, the term "tidal river" means the seaward most reach of a river/stream where the salinity is* $\leq$ *0.5 ppt at a time of annual low flow its surface elevation responds to the effects of coastal lunar tides. Where the river salinity exceeds 0.5 ppt, the respective river reach will be viewed as estuarine.*]

Total Capital Costs: The total sum of all construction costs; design, engineering, and architectural costs; equipment costs; construction material costs; instrumentation costs; installation labor costs; and allowances for funds used during construction (AFUDC).

Trash Rack: ***See Bar Rack.***

Traveling or Other Intake Screen System: Devices placed at or near the opening of an intake structure to mechanically stop smaller debris and/or organisms from entering a plant's water system.

Typical Calendar Year: A year in which the facility and its cooling water intake structures are operated in a normal, routine, regular, or otherwise standard fashion.

Water Body: Any number of potential sources of intake water for cooling water intake structures. Includes municipal water sources, ground well water, oceans, lakes, reservoirs, rivers, and estuaries.

Water Supply of Plant Other Than Own: Water obtained or purchased from a plant other than itself. This other plant would own and operate its own onsite well or directly withdraw water from surface water or other sources of groundwater. Depending upon the intended uses of the withdrawn water, the other plant might provide treatment. Moreover, the other plant might sell the water to other entities or use it onsite. The other plant, however, would not provide potable water to residential populations like a local water supplier.

Waters of the United States (U.S.): All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters subject to the ebb and flow of the tide. Waters of the United States include, but are not limited to, all interstate waters and intrastate lakes, rivers, streams (including intermittent streams), mudflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds. The definition includes waters which are or could be used by interstate or foreign travelers for recreation or other purposes and those waters from which fish or shellfish are or could be taken and sold in interstate or foreign commerce or which are used or could be used for industrial purposes by industries in interstate commerce. Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA are **not** waters of the U.S. ***See 40 CFR 122.2 for a more complete definition.***

Water Used for Process Activities: Water that will come in contact with or result from the production or use of any raw material, intermediate product, finished product, waste product, or wastewater. This includes water used in processes whose discharge is regulated by effluent limitations and new source performance standards and stormwater runoff which comes in contact with industrial materials or processes.

For facilities covered under the Steam Electric Point Source Category (40 CFR Part 423), this would include water used for boiler makeup or freshwater, ash handling systems, metal cleaning systems, screen backwash, laboratory activities, wastewater treatment (filter backwash, demineralizer waters, etc.), and service water not otherwise designated.

Weir (or Skimmer or Curtain) Wall: A device placed before an intake structure to prevent warmer surface water and floating debris from entering the intake structure.

Wetlands: Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Zero Discharge Plant: A plant that does not return any treated or untreated plant effluent (excluding stormwater) to surface water, a POTW, a privately-owned treatment works, or a groundwater injection well. An example of a zero-discharge plant might be an entity that discharges its total effluent to an evaporative pond or that completely recycles its wastewater.