

Improving Regulatory Effectiveness
in Federal/State Siting Actions
**Water Supplies and the Nuclear
Licensing Process**

July 1977

U.S. Water Resources Council for
Office of State Programs
U.S. Nuclear Regulatory
Commission

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Water Supplies and the Nuclear Licensing Process

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**Improving Regulatory Effectiveness in
Federal/State Siting Actions**

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THE INTERSTATE CONFERENCE ON WATER PROBLEMS

The Interstate Conference on Water Problems is a national association of State, intrastate and interstate officials and Legislators concerned with water resources administration and related matters. The Conference was established in 1959 as an outgrowth of regional conferences on water problems as recognized in the same year by action of the General Assembly of the States.

ICWP, as an independent association of water officials, works cooperatively with the National Governor's Conference, the National Conference of State Legislatures and the Council of State Governments and serves as an advisory body to other associations of government officials in the area of water resources management, conservation and development.

The purpose of ICWP is to facilitate cooperation, consultation and exchange of information among State, intrastate and interstate officials and agencies as to the conservation, use, development and administration of water and related land resources, the law governing these matters and Federal-State relationships in the field of water and related resources; and, to the extent feasible and desirable, to promote a consensus or harmonizing of State and intrastate views on any subject within the purview of the Conference, and to present and disseminate such views.

ICWP is managed by a 12-member Executive Committee elected annually and reflecting geographic distribution. Currently, Board members are from Western States (Idaho, Montana, Nebraska and Utah), Central States

(Minnesota and Ohio), Northeast (Massachusetts, New Jersey and Maryland), and South (South Carolina and Mississippi).

The ICWP Executive Committee serves as the Standing State Advisory Committee to the U.S. Water Resources Council (WRC). Executive Committee members and selected Committee and Task Force Chairmen meet with the members and staff of WRC periodically to discuss and advise on pending water resources issues and policy. In addition, ICWP Committees and Task Forces have prepared several position papers and in-depth reviews to assist WRC in developing policy and review documents for submission to Congress and the Federal Executive agencies.

Conference members also serve on several special task forces in cooperation with other organizations, including Federal agencies, to review pending legislation and administrative regulations relating to water resource programs.

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DISCLAIMER

This report, prepared under contract with the U.S. Water Resources Council for transmittal to the U.S. Nuclear Regulatory Commission, was produced by the Interstate Conference on Water Problems in an effort to provide a compilation and summary of the views of selected States regarding relationships of water supplies to the nuclear licensing process.

This publication does not represent the official position of the U.S. Water Resources Council, or the U.S. Nuclear Regulatory Commission, nor does it represent the position of any single state or the ICWF.

Though 24 States and two Interstate agencies participated in the development of this report through attendance at formal meetings and review of drafts, no endorsement by any agency is claimed, and no endorsement was requested. All States may be assumed to reserve judgement on the contents of this report until further review is completed and until WRC and NRC determine their use of the report findings. The letter received from the State of Georgia (attached as Appendix A) fully reserving endorsement clearly describes the general position of most States relative to the use of reports of State information by Federal Agencies.

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INTRODUCTION

The general responsibility of the Interstate Conference on Water Problems (ICWP) under its Contract (Memorandum of Agreement) with the U.S. Water Resources Council (WRC) in the activities summarized in this report are related to the nuclear licensing process. Specifically, ICWP was to identify State "procedures to obtain State/regional involvement in early site review or permit activities in the licensing of nuclear facilities." The Contract between WRC and ICWP also covers States' input to WRC on implementation of Section 13, P.L. 93-577, The Federal Non-Nuclear Energy Research and Development Act. A report on the States' views on this subject will be delivered to WRC at a later date.

The information included in this report was originally identified in a request from the Nuclear Regulatory Commission (NRC) to the U.S. Water Resources Council (WRC). WRC, in order to obtain input from the States, contracted with the Interstate Conference on Water Problems to compile the States' views and recommendations for transmittal to the Nuclear Regulatory Commission.

The specific forms of assistance requested of WRC from NRC and subsequently referred to ICWP were:

"1. Identification of State permit procedures with respect to water quantity as they relate to Federal/State coordination in the licensing of utilization or production facilities.

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"2. Examination of State/regional involvement in early site reviews or permit activities which may be needed as part of procedures suggested in Section 102 ss(f) and Section 102 or the proposed legislation." (S.3286, 94th Congress.)

The information provided in this report is to contribute to a larger study by NRC titled, "Efficiency in Federal/State Siting Actions." The detailed study plan (September 15, 1976) for this study was designed by NRC "in keeping with the spirit of Section 102 of the proposed legislation." Section ss(p) states:

The Nuclear Regulatory Commission, in cooperation with other Federal and State agencies, shall conduct a study of methods to improve further the procedures for Federal and State participation in the review and approval, in areas other than protection against radiation hazards and protection of the common defense and security, of sites for utilization or production facilities. The study should give particular attention to methods for coordinating and reaching environmental decisions as efficiently as possible. The Chairman of the Nuclear Regulatory Commission shall submit the results of this study together with any recommended legislation to the Congress within twelve months of the date of the enactment of this Act.

The detailed NRC study plan further outlined the task requested of WRC and subsequently delegated to ICWP in Part 2.8, State Determination of Water Rights as follows:

This task will examine Federal/State coordination in review of water rights or quantity permits required for facilities' cooling systems. The extent to which State determination and adjudication of water rights may be involved in the efficiency of the environmental decision making may be a critical factor in many States. This task could summarize current work by the National Water Resources Council and the Water Basin Commission as it relates to quantity problems.

The section of this report relating to radiological concerns was not mandated in the contract. However, discussions with representatives of the States participating in the workshops and involved in review of the

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project highlighted this concern. States emphasized that any report of their views that did not include this issue would be incomplete and not reflective of the true problems encountered in processing applications for nuclear facilities.

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METHODOLOGY

ICWP's Chairman delegated general management of this contract to a special project management committee representing broad geographic distribution. Members of the Project Management Committee resided in the States of Ohio, Pennsylvania, Georgia, Wyoming and Utah. In addition, representatives of WRC and NRC served as exofficio members of the Project Management Committee. The Project Management Committee met four times to review project activities, coordinate planning of future activities and review and approve reports. There was continuous communication between the Project Management Committee members and between the members and project staff.

The States participating in the project were selected by mutual agreement between the WRC, NRC and ICWP, based on the following criteria:

1. Different geologic and hydrologic characteristics be represented.
2. Different systems of water law be represented.
3. Potential for new energy development (either nuclear or non-nuclear) be present.
4. Differing stages of nuclear energy development be represented.

To accomplish the responsibilities relating to the NRC request under the Memorandum of Agreement systematically and consistent with the time limits set by NRC, it was agreed to by the parties to the agreement that 15 States plus the member States of the Western States Water Council be included in the NRC study. These states are:

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Alabama	Idaho	New Mexico	South Carolina
Arizona	Illinois	North Carolina	South Dakota
California	Indiana	North Dakota	Utah
Colorado	Kentucky	Ohio	Washington
Florida	Montana	Oregon	West Virginia
Georgia	Nevada	Pennsylvania	Wyoming

To obtain input for this report, ICWP has held formal meetings with State officials from Montana, Wyoming, Illinois, North Carolina, South Carolina, Georgia and Florida. These meetings were conducted at:

<u>Location</u>	<u>Date</u>	<u>States Participating</u>
Billings, Montana	23 November	Montana, Wyoming
Columbia, South Carolina	23 November	South Carolina
Atlanta, Georgia	30 November	Georgia
Tallahassee, Florida	1 December	Florida
Springfield, Illinois	6 December	Illinois
Raleigh, North Carolina	7 December	North Carolina

Project Staff conducted the meetings with assistance from Project Management Committee members and participating State officials. State officials in attendance at the meetings included representatives from the following State organizations:

- Water Resources Management
- Water Research Institute
- Water Quality
- Fish and Wildlife Management
- Power Plant Siting
- Department of Agriculture
- Water Surveys
- Geological Survey
- Natural History Survey
- Planning
- Energy

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In States where no formal meetings were held, agencies were requested to review preliminary documents and submit their comments in writing. Response to preliminary documents and the draft of this report was very helpful in formulating final recommendations.

In the area served by the Western States Water Council (WSWC) a special project workshop was held January 27 in Portland, Oregon. Ten States were present at the meeting and the 11th WSWC member State had submitted earlier comments by phone.

To obtain input from prior studies ICWP reviewed portions of the following studies and documents:

1. "Nuclear Energy Site Survey--1975", prepared by NRC to assess the implications of large energy parks involving groups of nuclear electrical energy generating plants.
2. "Federal Power Commission Order, FPC 383-3," relating to the duties and functions of the Regional Reliability Councils.
3. "Federal Energy Regulation: An Organizational Study," prepared in 1973-74 by the Federal Energy Regulation Study Team to identify alternatives and recommend improved approaches to Federal involvement in licensing energy facilities.
4. "Nuclear Issues: A briefing Document for the Southern Governors," prepared in November 1976 by the Southern Interstate Nuclear Board as a key issue reference in response to the Staff Advisory Committee of the Southern Governors' Conference.
5. Reports of the NRC-sponsored Annual State-Federal Power Plant Siting Conference, which identified suggestions for improving Federal/State coordination of the nuclear licensing process.

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A representative of ICWP also participated in the NRC-supported Workshop, "State Perspectives on Energy Facility Siting," held in Atlanta, Georgia December 15-16, 1976. A report of this workshop will become a part of the overall input of NRC's study, "Efficiency in Federal/State Siting Actions."

Each of these activities--workshops, review of studies, special correspondence, participation in other organization meetings and the continuing communication between project management committee members and staff--contributed to this report. Without this comprehensive approach, and the voluntary commitment of time by State officials, the completion of this project would not have been possible.

The major issues identified by the States and compiled for this report are divided in two categories: general siting considerations and radiological concerns, including waste management and transportation of nuclear materials.

Information on procedure for water allocation and permitting and power plant siting was collected from selected State and Interstate agencies. Reports from nine (9) State and Interstate agencies are included as Appendices to this report, providing examples of the variety of approaches States utilized to meet the needs of their citizens.

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GENERAL SITING CONSIDERATIONS

The identification of water quantity permits as an element of the NRC's study "Efficiency in Federal/State Siting Actions" indicates that this issue has high visibility with the Federal licensing agencies.

Consideration of State permit procedures which relate to efficiency in Federal-State coordination invariably has its initial focus on State laws regulating the utilization of surface waters. ICWP's study effort, however, has attempted to expand the consideration to a broader scope.

ICWP member States, while recognizing the primary function of water allocation law in making many major industrial facility site decisions, also recognize that many additional factors govern final facility decisions to a far greater degree than the availability of unallocated or transferable quantities of water.

Surface Water

ICWP has found that there are--in the States participating in this study--as many permitting/licensing systems as there are States. The study concentrated on relationship between the water permitting and water resources management systems as they relate to water availability for any large water-consuming industry.

The two generally accepted categories or systems of law applied to water allocation are the doctrine of riparian use and the doctrine of prior appropriation. The riparian doctrine generally applies in eastern

States and the doctrine of prior appropriation generally applies in the western, arid States. States have adapted these systems of water law to meet the needs of their citizens efficiently. Because of these adaptations, the laws of the States do not always have the consistency which appeals to national program managers. For example, in the area served by the Delaware River Basin Commission, the doctrine of equitable apportionment has been accepted by the participating States and the Federal Government.

The rights of riparian owners are neither clearly quantifiable nor are they necessarily stable, leaving the private and public utility companies in a relatively more risk-oriented situation. Many riparian States do not have mechanisms for allocating water in advance of actual withdrawal, conflict and court litigation. Thus, they have no vehicle to take into consideration all existing and potential claims on the water and determine if the utilities' requests would diminish the right of any other riparian. The balancing of interest only occurs in the context of a court suit brought by parties claiming existing or prospective injury.

Where "riparian" States have adopted permit allocation programs, the considerations for issuing an allocation and the limits imposed are usually established by State statute. The permit system may provide a right to specified quantities of water over a certain period, thus providing greater security for the water user. Generally, however, permit allocations in the eastern States are time-limited and may be revised by the issuing agency as circumstances (including new uses) warrant. The

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North Carolina procedures outline attached as Appendix B indentifies those priorities and limitations which apply under their riparian system .

The Western states appropriation doctrine has been described by Wells Hutchins in Water Rights Laws of the Nineteen Western States as follows:

The appropriation doctrine contemplates the acquisition of rights to the use of water by diverting water and applying it to reasonable beneficial use for a beneficial purpose, in accordance with procedures and under limitations specified by constitutional and statutory law or acknowledged by the courts. The water may be used on or in connection with lands away from streams, as well as lands contiguous to streams. A distinctive feature of the doctrine as it was developed in the West is the principle of "first in time, first in right" the prior exclusive right of the earliest appropriator of water from a particular watercourse to the use of the water to the extent of his appropriation, without material diminution in quantity or deterioration in quality, whenever the water is available; each later appropriator has a like priority with respect to all those who are later in time than himself. In the absence of constitutional or statutory modifications, the principle of "first in time, first in right" is still valid. However, certain States have authorized preference and imposed restrictions upon appropriations made under prescribed statutory procedures, the effects of which under some circumstances is at variance from the right of the first applicant to be accorded the first priority. The appropriative right relates to a specific quantity of water, and is good as long as the right continues to be properly exercised. The right may be acquired for any use of water that is beneficial and reasonable.

The distinctions between prior appropriation and riparian doctrines for water allocation/administration were anticipated in this study. The administration of these doctrines is of long standing, is well recorded,

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and should be well understood by all public and private utility companies that may be applying for NRC construction and operation licenses. These systems and their distinctions are not necessarily well understood by the public, but information on their requirements is readily accessible in the respective States. Sample information received from the State of Wyoming (Appendix C) and the State of Montana (Appendix D) displays the requirements and the process for obtaining water.

The application of these doctrines varies from State to State, based on the development of local legal customs and the hydrologic characteristics of the area. The systems also overlap in some States and in some cases are operating in a parallel fashion. The NRC and its license applicants need to inform themselves fully on the requirements for water appropriation in the State of issue in order to assume full compliance and timely determination of the availability of water for the facility to be licensed.

Interstate Compacts

Interstate compacts also govern the availability of water supplies for nuclear energy facilities in many areas of the nation. In areas where compacts have been developed, there are specific requirements for flow maintenance and the delivery of a specified quantity of water to the receiving (downstream) States. The Colorado River Compact, allocating waters both between upper and lower basin states and between States of each sub-basin area is an excellent example of Compact requirements.

In the areas where Interstate Compacts do not yet exist, careful consideration must still be given to the needs of downstream water consumers.

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The impacts on downstream riparian owners in other States may be as critical in the noncompact streams as it is in those where compacts exist.

Ground Water

In many areas of the nation, use of ground water as a viable alternative to surface water for cooling purposes within nuclear energy facilities is being considered. State procedures for issuance of permits for utilization of ground water are not necessarily identical to the procedures for surface water. The complexities of ground water withdrawals often require a much more rigorous analysis to determine potential impacts of a proposed use on other users. Ground water resources are often interconnected hydrologically and hydraulically, with surface water resources.

The need for additional information on the interactive effects of ground water withdrawals is intense. While much has been and is being done to describe ground water supplies, the need for additional baseline data exists in many areas. In some regions, the conjunctive effects between ground water and surface water are receiving increasing attention by State water management agencies.

Instream Flow

The review of an application for water supply by the States requires a concurrent evaluation of the potential water quality impacts due to water withdrawal and waste discharges by the applicant facility.

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The simple fact that an adequate quantity of water exists--at low flow and after other users are supplied--is not sufficient consideration for application review. The States have water quality certification programs which require that structures placed in water (for instance water intake structures) be certified regarding their compliance with water quality standards of the State.

A number of states have classified streams for best of highest use or to insure the protection of environmental values. Application of these systems of classification has generally been preceded by planning activities with extensive public participation. Regulations associated with these classification systems may involve water quantity, water quality and land uses adjacent to the principal water course. Some states have programs enabled by recent legislation for declaration of wild and scenic rivers and protection of similar environmental values. Wherever resources have been classified, water supply permit procedures generally require their consideration.

These systems, coupled with State water quality laws regulating discharges, are applied to all industrial facilities.

States are adopting minimum stream flow policies and regulations for the benefit of fish, aquatic life and wildlife maintenance. Procedures for determining optimum and minimum flows for these purposes have been refined substantively by State environmental and fish and wildlife agencies.

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For example, Oregon has reported that the quantity of water covered by the adopted minimum stream flows exceeds all other uses in the State of Oregon.

The integration of water quality with water quantity in state planning and regulatory procedures represents a major advancement in water management. Such procedures further require considerations of loss of assimilative and dilution capacity due to depletion of stream flow. Depletion of inflows into estuarine resources with resulting changes in the regimen of the interface between fresh and saline waters also are increasingly forming a part of these concerns.

In some areas these low flow conditions may require development of new storage facilities by water users, with their potential environmental hazards, to provide make-up waters to maintain flows during drought periods.

Thermal Discharges and Evaporative Losses

The U.S. Environmental Protection Agency and the States have adopted standards for thermal effluents from all facilities. However, no firm agreement exists on the effects of these thermal effluents on the receiving waters. The major areas of concern regarding thermal effluent are: effects on fisheries and wildlife; effects on the food chain; effects of intermittent thermal discharges; and synergistic effect of thermal and other waste discharges. Some studies report that there is little damage from thermal discharges and possibly some limited enhancement in certain areas. Other

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studies report distinct changes in the environment following addition of thermal effluents. These studies, as orally reported at the ICWP Energy Project meetings, are related to specific sites and are based on limited information. Because no clear scientific agreement exists on the impacts of thermal discharges, additional research will be required before this issue will be eliminated as an area of potential delay in siting of major facilities.

To minimize the effects of thermal discharges on receiving waters and to meet the temperature standards of the States, electric generating facilities are utilizing different types of cooling systems, such as cooling ponds and evaporative cooling tower--open cycle and closed cycle systems. There is a general concern among State officials regarding evaporative loss of water associated with cooling systems used by electrical generating facilities. A corollary concern is disposal of cooling tower blow-down from closed cycle systems. Disposal of this concentrated effluent can have adverse water quality impacts, whether it is placed on land (with potential seepage into groundwater) or returned to the surface water.

Because no firm answers to this problem of evaporative loss, workshop participants indicated the need for comparative scientific studies of the evaporative losses. All cooling methods should be studied, including reservoirs and cooling ponds, flowing rivers and streams (once through cooling), and the various cooling tower methodologies. The results of the many studies now underway and recently completed should be compiled and summarized to assist State and Federal decision makers as they seek the most appropriate methodology for each new plant site proposed.

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Water and Energy Conservation

As the utilities seek to meet the thermal discharge requirements and the water supply problems associated with cooling towers, new potential sources of water supply are being tested. It was reported that a new electrical generating facility in the Tucson, Arizona area will be meeting a portion of its water requirements with municipal wastewater treatment plant discharges. Innovative reuse of water in these ways is being encouraged by the States to better conserve and manage their scarce water resources. However, new cooling water sources can also present health, environmental and water rights problems which need thorough scientific analysis.

Study participants noted that innovative reuses of water represent the collection of or the taking of water from a different point in the hydrologic cycle rather than a new source. These "sources" are not necessarily water conserving, but they may lead to an indirect energy saving. Whether water or energy conservation is being considered, the full system of the water or fuel cycle must be reviewed to effectively test the innovative techniques.

States are taking the initiative to develop alternative energy conservation concepts and programs. Assistance for these initiatives is being provided by many Federal agencies, with leadership by the Federal Energy Administration State grant programs. One concept being considered in several States is secondary use of waste heat from electrical generating facilities. Because water is the major transfer element for the waste heat, it can be anticipated that electrical utility companies planning new facilities

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in these States, will be required to present alternatives to the traditional heat dispersion systems. Conservation of this heat energy may provide benefits in the conservation of water resources. These alternative systems should also provide an opportunity to extend the concept of multiple use of water, necessary for comprehensive planning and management of this scarce resource.

Comprehensive Water Resources Planning

The foregoing issues of thermal discharges, maintenance of streamflows, evaporative losses and alternative waste heat disposal systems are not traditional water supply (quantity) issues. Enumeration of these problems, however, does highlight the current situation in which no agency--the States, the Federal Government, the private and public utilities--can separate water supply issues from water quality considerations. This fact highlights the need for enhanced comprehensive planning at the State level. The continuing relationship between water quality and water quantity requires ongoing monitoring to facilitate the early and efficient processing of permits.

In most states, water resources planning programs have been in progress for many years. State water resources planning processes take different forms among the states. In some states, a comprehensive water resources planning process exists; in others, water may be only one of several natural resources of concern within a broader resource planning activity; and in others, the planning effort may be limited in focus to specific water resource concerns such as agricultural water supply or water quality management. State

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planning may also be integrated with the planning efforts of Federal agencies and other states through River Basin Commissions created within the framework of the Federal Water Resources Planning Act of 1965 and Federal/State compacts such as have been formed for the Delaware and Susquehanna River Basins. These integrated efforts compliment intrastate planning. Integration of water planning with land use planning has been stimulated by recent Federal legislation such as the Federal Water Pollution Control Act Amendments of 1972 and the Federal Coastal Zone Management Act of 1974.

Increasingly, States are viewing planning as a continuing and dynamic process. Hence, the comprehensive planning reports are not being used as a rigorous framework for a permanent regulatory response to short- and long-range interests. Instead, the periodic reports are increasingly being used to guide decisions for the immediate future and are being regularly updated to incorporate differences between projection and performance, new knowledge and changing priorities at the national and State levels.

Water requirements and water quality control for energy development are one of the considerations in State water resources planning processes. In many States, the level of involvement of energy producers and suppliers has been mixed, largely because of lack of initiative by the industry. Due to industry's reluctance to participate, some existing planning reports are therefore not responsive to the total spectrum of water resources needs which accompany energy development. Similarly, industry planning for energy development may be proceeding independently of the concepts, policies, programs and plans for management and use of specific water resources which are recognized and accepted within the state water resources planning process.

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The States have a continuing concern to plan for the most effective, multipurpose use of water resources. Water has traditionally been considered a public commodity and has been available at no cost or at a very low cost. This has been true in the East under the riparian system where the water is "free." It has also been true in the West where the cost of developing water supplies remains a very small part of the total cost of constructing and operating energy facilities, and where large increases in the cost of water lead to only minimal increments in the cost of energy. Water quality requirements and instream flow requirements will require additional analysis of proposed withdrawals. This analysis can be expected to require a utility to present alternative water use systems and could possibly mandate utilization of alternative construction plans in order to meet the State requirements.

Hydrologic information of a general nature on water resources is readily available in all States, assuming most sites will be in proximity to major sources of surface water. This information has been developed to support the continuing comprehensive planning process. Long-term stream flow records exist in most States for major streams or can be generated through mathematical modeling techniques, given sufficient lead time. Ground water data needed for site specific analyses are not abundant. Additional data can be expected to be required for the majority of major electric generation facility sites impacting on ground water. For areas of concern where data/information has not previously been collected, extended time periods for data collection should be anticipated.

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Although the comprehensive water planning process is dynamic, the utilities have full access to information on water availabilities, water allocation procedures and State priorities for use of the water. While these plans (or plan revisions) are in varying stages of completion, sufficient information is available to permit rational discussion of alternatives for facility siting between the States and a reasonable and responsive utility. The utilities will also have information which may assist the States in completing the data base required for their comprehensive plans. It has been suggested that there could be a significant advantage in having a shared (State-industry) data base.

Electrical Utility Planning

The States' major problem in facilitating utility planning and permitting requirements is obtaining alternative site information in advance of the actual permit request or allocation process to enable their staff to perform the necessary site specific analysis. It is, therefore, vital that the States receive alternative site information at the earliest possible time from the utility companies and the Federal agencies involved in developing, licensing and/or supporting the proposed facility.

A number of States have begun identifying potential sites for new energy facilities (both electrical generating and new technology) either independently or with the cooperation of industry representatives. States have developed environmental policies which are publicly accepted and which can aid in proper energy facility siting when used by the electric utility in its decision making processes. While final approval depends on the specific processes utilized at the site, this early identification effort provides an

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opportunity for utility companies to enter into early and rational discussions with State agencies and public interest groups regarding site selection.

The State of Washington has developed a form of one stop siting review to facilitate the issuance of all permits required for facilities. Appendix E outlines the Washington rules. Minnesota has developed its own system of environmental impact analysis which brings all State agencies into the review process early in the utility's planning program (see Appendix F for requirements). The Delaware River Basin Commission has mandated the early review of all electrical generating facilities (Appendix H). Montana has also developed a program for reviewing major facilities and has a special permit procedure to assure a comprehensive response to applications (Appendix D).

Working through the early review process, both the State and Interstate agencies and the utility may anticipate early identification of potential problems.

Agency personnel in some States indicated that public utilities are becoming more willing to provide detailed early site information for review and study. In the past, this early information was considered proprietary and was not released until the final stages of planning in order to preclude land speculation. In some States, utilities have found that early public announcement of potential sites facilitates all licensing processes, with savings in time more than offsetting any increased land costs. Because land costs represent a small percentage of the costs for an energy facility--even smaller in a nuclear facility--land cost increases are not believed

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by the States to be a detriment to early announcement of the sites. States also recognized that land costs are included in future rate structures. In one State, it was reported that early announcement of sites has caused some land speculation, but that such speculation had been dampened when a potential site was rejected by the utility following detailed geologic evaluation, leaving the speculator with a very expensive, but relatively useless, piece of land.

FPC Reliability Councils

The Federal Power Commission under FPC Order 383-3 has established a national network of Regional Reliability Councils for the purpose of assuring a continuing and reliable supply of electric power. Regional Reliability Councils include in their membership all bulk electric power suppliers and represents only the electric utilities. The Councils prepare reports, updated annually, which project the major generation and transmission facilities required to meet the industry's electrical demand forecasts.

The general nature of the Regional Reliability Council Reports is such that they are not plans or reports of plans, but only limited projections. The methodology used by the utilities in preparing projections for these reports is not uniform. ICWP workshop participants have reported that these reports do not reach their agencies, or if they do, the reports do not necessarily reflect the actual plans, in terms of planned facility locations for new electric generating facilities.

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States, through public utility commissions which deal with utility rates or certificates of public need and convenience, also consider with facility siting. The public utility commissions could have the opportunity, through review of an improved annual report of the Regional Reliability Councils, to identify all future utility sites in their geographic areas. These reports could provide the basis in all States for early site review and revision of utility company plans to provide additional benefits to an area, to minimize damages, and to facilitate licensing and permitting processes.

In some areas of the nation, interstate agencies with regulatory powers now require utilities to provide 15-20 year (annually updated) projections, of projected and planned facilities. (See Appendix H, Delaware River Basin Commission.) Some States also require utilities serving their citizens to prepare similar detailed reports. These State and Interstate reports appear to somewhat duplicate the FPC required reports.

If improved Regional Reliability Council reports are distributed to the State agencies involved in final permit of electrical generating facilities, the reports could facilitate and expedite the decision making process. State agencies would be able to improve coordination of their reviews and provide early input in the Federal licensing process.

To increase public awareness of the utility plans and an improved public understanding of the nature of potential facilities, the Regional Reliability Council reports could also be presented at public hearings in each of the affected States each year. This would provide the opportunity

for full public scrutiny of both the utility's projected demand and its suggested methods and facilities for meeting the demand. Such early public meetings should assure that all interested parties have the opportunity to surface concerns prior to the final permitting and licensing processes. States have further suggested that, to insure that State agencies become more cognizant of the Regional Reliability Council reports, the Federal Power Commission should submit the reports to the States through the A-95 Comprehensive Review systems.

Public scrutiny of and objections to nuclear facilities have generally not surfaced until large sums of money have been invested in planning, developing and reviewing the facilities. It is at this time in facility development that delays are generally most costly, in terms of monetary and credibility losses, by the utility and the regulatory agencies. Early hearings, involving both the Federal and State regulatory agencies and the utilities, could provide the vehicle for avoiding expensive delays at the end of the process.

Linkages Between Water Planning and Regulatory Functions

In the past, the linkages in most states between water resources planning and regulatory activities have not been formal or absolute. In many cases, State plans and reports have served solely as reference documents for review of applications for water use permits. This situation is changing rapidly in most States. Consolidation of State water agencies under one agency, and legislative requirements for specific determinations in

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relationship to the current State water plan are examples of the means through which States are tying planning and water management more closely together.

Communication between NRC and the utilities and the State water permitting agencies have been limited. A continuing and open communication process which mandates early notification to the States by NRC of any potential facilities could greatly facilitate early permit and licensing processes. Early review would provide an opportunity for early public hearings when needed. This would establish a forum for both interested citizens and special interest groups to surface concerns and objections at a point in the planning process when these concerns can be considered without overall delay in facility development, and without imposing a financial burden on the utility company and the regulatory agencies.

There is a continuing need for early communication between the utility companies, NRC, and the State water management agencies to facilitate the development of information required for water allocation and permitting processes. There is a further need to enhance the States' comprehensive water planning process so that general information is available which can assist the State in advising utilities and Federal regulatory agencies on the acceptability of potential sites for the location of major electrical generating sites.

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LEGISLATION

Reports of several Federal agencies and reports of several conferences and meetings have been reviewed as a part of this project. Proposed and draft legislation have also been reviewed to gain a perspective on potential changes in Federal and State procedures. The NRC study, from which the request for this report emanated, is based on proposed legislation (S. 3286, 94th Congress) dealing with nuclear energy facility licensing and site permitting. Because this legislation and the other report recommendations reviewed could impact significantly on State processes and prerogatives, State comments relating to selected subjects identified in the proposals have been compiled.

The NRC-supported conference, "State Perspectives on Energy Facilities Siting" (Atlanta, Georgia, December 15-16, 1976), in preliminary draft reports, recommended consideration of Federal legislation which would:

Delegate site approval authority to the states provided their site approval process contain provisions for:

- a. The review to be complete within a specified time period,
- b. Meaningful public participation in a manner consistent with State administrative procedures including the filing of notice and providing an opportunity for interested parties to be heard,
- c. Requiring that the decision, when reached, will be binding on all state agencies,
- d. An appeal mechanism with a specified statute of limitation except upon the discovery of new material evidence or changed circumstances.

(This draft recommendation is not necessarily interpreted as a proposal for one-stop siting. The need for finality is recognized and the proposal (subsection c above) is interpreted as requiring that all permits be approved on or before the date that the State site approval and authority to proceed is given. This interpretation, therefore, provides that the process would have the color of finality.)

The preliminary report further states that:

It is highly desirable to have Federal legislation... to better define Federal and State authority and to clarify the responsibilities of all government entities.

The States can and do provide efficient and effective permitting procedures now. States have also joined together in interstate compact commissions, such as the Delaware and Susquehanna River Basin Commissions, to undertake the planning and review processes required to issue permits and allocate water for major facilities such as nuclear electrical generating plants.

It is recognized that the procedures developed by the States and interstate institutions vary in accordance with State and regional historical precedents, but these variances are not seen as barriers to efficient and effective processing.

Delegation of an authority by the Federal government (as stated in the above quotation) implies that the Federal government has the authority to delegate. Conversely, where the Federal government delegates an authority to the States, the implication is present that the States do not have the authority originally. Delegation, as specified in the preliminary draft report and outlined above, would be wholly inconsistent with the findings by the Federal Energy Regulation Study team in the report of April 1974, "Federal Energy Regulation: An Organization Study," which states:

Historically, State and local governments have been responsible for regulating land use within their jurisdictions. This includes siting as well as other aspects of energy facilities.

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The body of expertise and familiarity with siting matters unique to individual localities would be difficult, if not impossible, to recreate at the Federal level.

Federal preemption of energy facility siting and licensing at this time would raise difficult administrative questions. A number of regulatory activities now being carried out by State and local officials are not unique to energy facilities but are part of total programs that include regulatory requirements with respect to such items as local ecology, aesthetic standards and compatibility with surrounding land uses. If State and local jurisdictions were divested of regulatory powers over energy facilities, their ability to carry out comprehensive planning would be diminished and their efforts to impose and enforce related standards eroded.

The Southern Interstate Nuclear Board, in its November 1976 document, "Nuclear Issues: A Briefing Document for the Southern Governors," reported in the analysis of State's authority vs. Federal Preemption that:

The States' jurisdiction over land use is not preempted by Federal law nor is any other regulation of aspects of nuclear power other than radiological health and safety matters. Also, a State can withhold or delay issuance of a certificate of public convenience and necessity...a company which proposes to operate a nuclear power plant is exposed to many areas of State regulation unrelated to radiation protection.

Before any such legislation is considered for presentation by NRC, the existing and emerging State programs and procedures should be reviewed to determine if substantive congruence exists today, or will exist in the near future. It is the experience of ICWP that new Federal legislation many times requires significant and unnecessary revision of State programs

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without any substantive change in the result. These changes are simply to meet bureaucratic requirements of Federal rules.

Federal legislation to better coordinate Federal authorities, however, could have significant positive impact. Legislation "to define" and "to clarify" State authority cannot be recommended. This latter type of legislation generally limits existing State authority and could not be supported unless without full consultation with the States. It is felt that even carefully drafted legislation is generally interpreted by the Federal administrative agencies and the Federal courts to the detriment of State authority.

The enactment of Federal enabling legislation of this type generally has the objective of creating a uniformity of requirements. It should also be noted that most electrical utility companies operate in a few contiguous States and would, therefore, be continually familiar with the differences in State procedures. It also generally has the effect of limiting the States' freedom to develop requirements and regulations to meet the States' independent and legitimate needs and without significant help to the utility. Because States believe that regulations should reflect State and local needs, citizen and legislative opposition to such a program of Federal requirements could develop, creating (avoidable) delays in the licensing of nuclear facilities. Thus, such legislation could have an effect opposite of that intended.

The preceeding analysis that delegation legislation is not needed and that State authority for siting decisions exists is verified in the "Nuclear Energy Center Site Survey--1975, Executive Summary" (NUREG-0001-ES) (page 13):

Jurisdictional Patterns--A practical framework for discharging State and local responsibilities and authorities exists, e.g., with respect to rate setting, taxation, and siting. Licensing and permitting activities, government services, and impact aid should remain largely within the established jurisdictional patterns. No completely novel institutional arrangements should be required. However, an important State initiative would be to review its pertinent laws and regulations to determine any changes that may be needed to facilitate handling and implementation of siting requirements for nuclear energy centers.

S. 3286, 94th Congress (Senators Pastore and Baker), provides the basis for NRC's study effort, "Efficiency in Federal/State Siting Action," to which this report will contribute. Section 103, S. 3286 identifies various options for NRC to provide partial licenses for nuclear or utilization facilities. These options are generally for advance permitting, enabling the applicant to proceed with site preparation, and minor safety-related construction activities for new and revised facilities. Advance authorizations for site activities are for limited periods of time, but do allow large investments and commitments for future investments to be made by the applicant. Advance authorizations are to be based on the assumption (to be validated through review of the applicable data submitted with the final application) that the site and facility would normally be fully approvable. Any partial permit, however, would be subject to the final determination of NRC on the construction and operating license, and the applicant would be proceeding at "his own risk."

Section 103, as proposed, provides a vehicle for incremental permitting. As such, it may offer remedies for some of the concerns regarding nuclear

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and fossil-fueled power plants in Pennsylvania. In a recent article, "Legal Control of Consumptive Water Use by Pennsylvania Power Plants," by R. Weston and J. Gray (80 Dickinson Law Review 383, 1976), it is reported:

One such issue is a procedural weakness of the NRC licensing process for construction permit applications. The NRC review comes relatively late in the process, and by that time considerable time, effort, manpower and funds will have been expended. As a consequence, several courts have recognized that because prior expenditures of funds and irretrievable commitments of resources must be considered by the agency as elements in the NEPA cost-benefit analysis, each additional increment of money invested in a project could tilt the balance away from environmental concerns. Although an agency's decision on the stage of a project at which a NEPA statement must be prepared is subject to judicial scrutiny, the NRC's requirement of a critical impact statement only at the construct permit stage remains effectively unchallenged. By that time sufficient resources may have been expended to limit or prejudice the environmental review process. The concern here is the probable impact of heavy consumptive uses on a supply stream during a drought period. An analysis of sites covering these aspects should be made conditional to preconstruction permits. Even in the "humid" East, conflicts in water uses are becoming more numerous and promises to increase with an increase in consumptive uses of water. (See Appendix G for full article).

State agencies recognize that early permit decisions and industry commitments must be made in order to reasonably facilitate final construction and installation of the nuclear generating facilities. Nevertheless, States have expressed a growing concern over incremental permitting. Based on prior experience with both nuclear and non-nuclear facilities, States have indicated that incremental permitting can, and often does, lead to approval of projects which, if considered as a final and complete proposal, might

be rejected. An incremental licensing process may have the effect of forcing the State or NRC into approving the final project because of the significant early investments by the applicant corporation where major financial commitments have been made in an incremental permitting process, the financial commitments themselves may become the major justification for a final permit.

Thus, it is further noted that incremental permitting prevents a comprehensive review of the total facility. Permission to proceed with a section or a preliminary site preparation, before the final operational characteristics of the facility are known, places the regulating agencies in a position of potentially accepting a facility which, if considered totally at the initial stage of development, would not fully meet the regulatory agency's criteria.

The need to protect the utility's investment, as well as the need to effectively utilize the regulatory agency's (State and Federal) manpower and funds, should mandate that complete plans be available prior to the initiation of any significant construction activities. This would allow a comprehensive analysis of impacts, benefits and costs, and would assure that the proposed facility will meet the most general criteria, that of wise use of the resources. If any incremental permit processes are to be allowed, committed expenditures by the applicant corporation should be eliminated from the evidence presented for any final permit approval.

Legislation which diminishes the States' authority, whether directly or indirectly, may anticipate strong opposition. The burden of proof for

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further Federal statutory regulatory authority should require a conclusive demonstration that improvement can be achieved beyond the present institutional arrangements and regulatory procedures of the States. The two proposals discussed in this report do not appear to meet the basic criteria. Additionally, other sections of the report cite other causes and problems of potential delay belonging in part to both the electrical utilities and the Federal agencies, which are not related to State or local performance on nuclear electrical generation facility regulatory activity.

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RADIOLOGICAL CONCERNS

The primary concern of individuals and therefore, of State governments, appears to be radiological, not water. Each State has indicated informally during the ICWP workshops that if the problem of the safety of the nuclear process can be solved, then water, if available within the State priorities, will not be a major stumbling block to future construction. Participants at several workshops indicated specifically that water permit processes had been used by the public to obtain a forum to discuss radiological concerns. Because they did not perceive other forums, the public chose the issue of water permits as a means to express concerns, obtain a hearing, and gain understanding of the nuclear process. The radiological issue, with the current public acceptance of the nuclear industry, appears to be inseparable from other environmental issues.

The State officials involved in ICWP's activities in this project have indicated a general personal acceptance of the safety of nuclear electrical generating facilities. But, they have indicated the need for greater public understanding of nuclear facility operation and safety. Without convincing assurances from NRC, ERDA, other Federal agencies and the nuclear industry, as required by Congress, that the safety issue is receiving adequate attention, the water officials see major limits to the future development of nuclear facilities.

Nuclear waste management is a second area of concern to the States. Because of the extended life of the spent fuel, State officials feel the

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waste management issue is of the highest priority. Simple burial does not seem to be an adequate answer to the management issue. Before there can be a major expansion of nuclear facilities, these officials believe the waste management issue must be effectively addressed. Waste management questions also relate directly to impacts on ground water of disposal or holding areas. Thorough analysis of potential interchanges between aquifers in and near storage sites is a necessity before the waste management issues are resolved. In particular, a detailed study of the projected effect of faults and seismic activities on storage sites must be made.

States in all regions of the nation have expressed concern due to Federal studies of areas as potential repositories for nuclear waste products. States do not universally have legislation which deals explicitly with the disposal of solid radioactive wastes (including mining wastes and spent fuels). Major objection to waste material storage and disposal in all States can be anticipated until containment of buried nuclear wastes is perfected to the satisfaction of the public. Additionally, because of the national character of the waste management problems and the relative urgency of finding a solution, the States have expressed concern that the Federal government may attempt to provide facilities for waste management under the cloak of "the national interest," without respecting procedures established under State law.

Transportation of nuclear products, both new and spent, is another area of continuing concern to some State officials. Movement of these materials, while requiring a significant amount of security, now appears to be handled

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with a minimum of coordination with State officials. Notification procedures reportedly are inadequate or nonexistent. Because of this lack of coordination a vehicular accident could become a major incident--even though preventable.

Coordination of contingency plans in case of a nuclear facility malfunction is also of concern to State officials and may become a delay in licensing. Because any nuclear facility emergency has the potential to impact water supplies for large areas, these plans are of concern both to State water officials and to the public.

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CONCLUSIONS

The following conclusions are based on input from the ICWP study project. While many other issues were discussed in this report and in the meetings which led to the report, these issues are believed to be the most important in determining new policy and procedure directions for the nuclear facility licensing process. As NRC begins to prepare its recommendations, it is hoped that these conclusions may be incorporated into the efficiency discussions.

1. Water supply is a major consideration in the siting of nuclear and other electrical generation facilities. A sufficient supply obtained under applicable State water allocation and water quality laws, is an absolute requirement for a site acceptable to the States. However, water planning and management decisions are continual in the States. Projected needs and supplies can be determined on a general basis well in advance of any particular application for a water supply permit in both nuclear and nonnuclear facilities, through the use of the comprehensive planning information.
2. Hydrologic information for basins or other areas within the States is generally readily available. This information may or may not be sufficient for State agencies to make final permit and water allocation decisions and to issue final site

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approvals. In the event that such information is not sufficient, the permitting process may be suspended until the required information is obtained and analyzed. Through early notification to State agencies of probable application, potential delays may be minimized.

3. The water allocation and permitting procedure, provided that sufficient hydrologic information is available, will generally not delay the licensing of a nuclear facility. Utility planners and Federal regulatory agencies should recognize, however, that water allocation and permitting decisions cannot be made until the required data have been analyzed. Utility companies must provide early site information (including alternatives) to State water agencies to permit incorporation in future planning.
4. Enhancement of the comprehensive water planning programs of the States would provide an expanded base of information for electrical power generating facility site decisions, thereby facilitating licensing and permitting processes for all parties involved--NRC, the utility companies, the citizens and the State itself.
5. All agencies involved in the licensing process--NRC, other Federal agencies, the States and the utilities--must share their plans and consult with each other at the earliest possible time in the facility planning process.

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NRC should provide information on projected licensing activities for specific sites to the States at the earliest possible date. This would permit the States to develop input into the licensing process and to perform early reviews of any sites being considered for nuclear facilities. This limited coordination process could meet the States' needs without the necessity for additional coordination processes which may require further bureaucratic procedures and potential delays.

6. Improvement and extension of existing reporting procedures, such as the Regional Reliability Council Reports prepared for the Federal Power Commission, through a public hearing process could provide a vehicle for early public discussion of nuclear facility issues.
7. State involvement in the licensing process must be specifically assured by NRC. Any comments or statements developed by the States, whether through an NRC licensing process, the A95 review process or the NEPA Environmental Impact Statement process must be reasonably resolved to the satisfaction of the States in order to prevent delays in the licensing/or siting process.

These licensing and siting review procedures, however, occur very late in the overall project development process--generally, after commitment of large amount of capital by industry and government--and are not considered to be a viable substitute for early coordination between NRC, the utility, and the State.

8. Joint Federal-State hearings for specific sites (when appropriate) and utilization of a common data base could expedite permit and license reviews. It is noted that joint hearings and a common data base may not be construed as a suggestion for common permit or license requirements between the Federal and State governments.
9. Radiological considerations will continue to delay siting, construction and operation of nuclear facilities until:
 - a. Waste management processes are developed and acceptable disposal and storage sites have been constructed and operated to insure final protection to the public and the environment.
 - b. Operations of a nuclear facility do not endanger lives or the surrounding environment, and these facilities are proven necessary for the generation of electricity.
 - c. Effective coordination between NRC and the States has been developed and implemented for monitoring and protecting the movement of nuclear materials and products.
10. Citizens will continue to pressure State regulatory agencies to use water and general environmental permit procedures to delay nuclear facility siting until there is greater public acceptance of nuclear facilities.
11. If the water allocation procedure is the only public process available for considering the general environmental and radiological issues, it can be assumed that the public will use this process, and that the water allocation process will become a "delay." While the EIS hearings procedure may provide an alternative to the water process for citizen input, the EIS procedure may come too late in the process for effective citizen input. The

public portion of the EIS procedure also comes at a stage in the development of facilities after major commitments of corporate and public agency financial resources have been made thereby limiting the potential for positive results from the EIS process.

12. State government agencies, and State elected officials, because of continuing and direct relationship with their citizens, will continue to take cognizance of public demands for comprehensive consideration of the issues involved in nuclear siting through State water and other environmental permit procedures, if other channels have not been opened to assure public confidence in the full nuclear fuel cycle.
13. Incremental permitting by Federal agencies is generally opposed by States.
14. Revision of Federal legislation, mandating changes in State site permitting procedures and water allocation processes, will not facilitate nuclear facilities licensing, and may lead to inefficiencies in the licensing process due to opposition of uniform requirements by the States and the length of time required to enact conforming State legislation.
15. The States have the general responsibility for final siting decisions, exclusive of radiological safety issues.

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Appendix A

State of Georgia
Commissioner's Letter

849219



Joe D. Tanner
COMMISSIONER

Department of Natural Resources

270 WASHINGTON ST., S.W.
ATLANTA, GEORGIA 30334
(404) 656-1500

February 2, 1977

Mr. William Mattox, Chairman
ICWP Energy Project
c/o F. Robert Edman and Associates, Inc.
W-3173 First National Bank Building
St. Paul, Minnesota 55101

Dear Mr. Mattox:

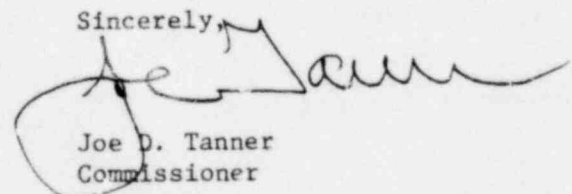
The Georgia Department of Natural Resources, in conjunction with the State Office of Energy Resources, has completed a review of the draft report, "Water Supplies and the Nuclear Licensing Process." Whereas specific comments are attached, there are two major policy positions that are of prime importance to Georgia.

First, any attempt to introduce legislation at the federal level that would serve to constrict, inhibit, or otherwise render inconsistent the present environmental permitting procedures in Georgia as authorized by State law would be strongly opposed.

Second, Georgia considers nuclear waste disposal and its associated transportation aspect as the paramount issue in the siting and operation of nuclear facilities. As you will note in the attached letter from Governor Busbee to the Administrator of the Energy Research and Development Administration, Georgia will not tolerate any possibility of contamination of its natural ground-water resources: "no matter how small the calculated statistical odds may be made to appear."

At this time the Department of Natural Resources reserves any endorsement of the report until such time as it can be determined how NRC intends to use it. Finally, Georgia strongly requests that the policy statements contained in this letter, as well as the attached specific comments, be included with the final ICWP Report.

Sincerely,



Joe D. Tanner
Commissioner

JDT:dbb

Attachment

cc: Governor George Busbee
J. Leonard Ledbetter
Omi Walden

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Office of the Governor
Atlanta, Georgia 30334

George Busbee
GOVERNOR

Norman Underwood
EXECUTIVE SECRETARY

January 25, 1977

Dr. Robert C. Seamans, Jr., Administrator
U.S. Energy Research & Development Administration
Washington, D. C. 20545

Dear Dr. Seamans:

Your recent letter, with attachments, regarding ERDA plans for establishing bedrock storage as a part of the National Waste Terminal Storage program for high level radioactive wastes from the nuclear power industry has been reviewed by staff of Georgia's Department of Natural Resources, Environmental Protection Division. We have the following comments and questions regarding those plans.

First, and of greatest importance, as we indicated several years ago, Georgia is unalterably opposed to any repository that could conceivably result in the eventual radioactive contamination of Georgia's underground water reserves, whether such repository be proposed in Georgia itself or in any neighboring state. As you know, Georgia's position on bedrock storage at the Savannah River Plant was established in 1972 by Governor Carter and as the current Chief Executive of State of Georgia I strongly reaffirm that position. You will note that Governor Carter's concern for the Tuscaloosa aquifer was also shared by EPA in 1972 when the Agency's senior staff warned that any proposal for storage of radioactive waste in the proximity of the aquifer would be viewed with extreme caution. Our great natural groundwater resource is regarded as vital to the projected orderly growth and development of Georgia, and no possibility of contamination, no matter how small the calculated statistical odds may be made to appear, can be tolerated.

We are pleased to learn from your letter that the "generic" draft EIS now in preparation will not be used as a device to replace future site-specific EIS's. However, we are deeply concerned regarding your subsequent indication (page 2) that:

"Public hearings on the respective drafts will also be convened if deemed appropriate and in the public interest."

I can state now that we will regard such public hearings as an absolute necessity, and will insist that they be convened in regard to any proposed National Waste Terminal Storage site that may affect Georgia's natural resources or welfare.

In regard to the participation of Georgia in the development of site selection criteria, as invited in your letter, it is requested that you clarify the paragraph on page 3:

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"It is ERDA's position that the project will be terminated if the State raises issues on the project connected with these criteria, and their application, that are not resolved through mutually accepted procedures."

Specifically, does the above statement mean that any state, such as Georgia, will be able to exercise a unilateral veto regarding a proposed site that could affect its welfare? Or, does it mean that a proposed project will be terminated if a state does not agree to a specific criterion? Or does the above statement merely mean that after site selection criteria have been chosen by ERDA, or by some sort of majority vote, a proposed project will be terminated only if a state can prove that one of the criteria is not met?

I will greatly appreciate receiving your early clarification of the above statement, and will trust that such a description of how your procedure is intended to work will provide clear answers to the above questions.

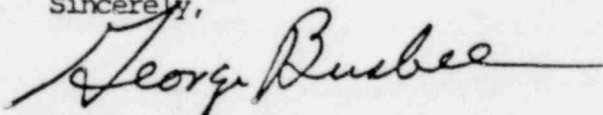
In reviewing your Enclosure A which summarizes planned activities in Georgia, the proposed studies for FY-1977 do not appear to incorporate seismology. We are very much concerned with the potential for earthquake activity in Georgia and in neighboring states, especially South Carolina, and the extent to which our groundwaters can be protected against major quakes. Again, we are not so much concerned here with what may appear to be the statistical odds as we are with the positive protective measures that are feasible, and their likely efficacy.

We have noted your statement that the proposed National Waste Terminal Storage repositories may be used for the final storage of spent fuel elements. Since a major problem is the lack of commercial fuel reprocessing and a fast breeder reactor due to uncertain technology in both areas, we question the practicality of selecting site criteria, much less designing a repository when the exact nature of the material remains unknown. We feel it is important to stress the undesirability of an overly hasty process of selecting site criteria for National Waste Terminal Storage repositories.

Please be assured of Georgia's sincere desire to be as cooperative as possible in achieving our national goal of energy independence. President Carter has stressed that the present administration will change the priorities for these programs and we know you will be responsive to these changes.

I will await your response to our comments and questions with a high degree of interest. After receiving that response, I will be much better able to reach conclusions as to the most fruitful way in which Georgia might best participate in your efforts to develop an acceptable solution to the problem of ultimate disposition of high level wastes from reactors.

Sincerely,



George Busbee

GB:cl

cc: Ga. Congressional Delegation
Dr. Carl W. Kuhlman
Mr. J. Leonard Ledbetter
Ms. Omi Walden

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Appendix B

State of North Carolina

Procedures for
Water for Energy

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NORTH CAROLINA

OUTLINE OF CURRENT STATE REVIEW PRACTICES CONCERNING
MAJOR WATER WITHDRAWALS BY ELECTRIC UTILITIES

1. The State Utilities Commission, by means of Rule R8-43, receives a list and general description of sites which are being considered for new generating facilities.
2. A copy of the list from Rule R8-43 is sent to the Department of Natural and Economic Resources (DNER).
3. For any particular site, unless it is in a Capacity Use Area, the electric power utility meets with water resources planning officials of DNER to begin working out a method to reduce impact of water withdrawals on the water system.
4. If site is located in a capacity use area, the utility must obtain water withdrawal permit from the Environmental Management Commission.
5. If site is located in an area of environmental concern (coastal N. C. only) then the utility must obtain a permit from the Coastal Resources Commission.
6. If neither steps 4 or 5 are true, then the following takes place:
 - a. If there is agreement between water resources planning officials and the electric power utility, then approval by the Environmental Management Commission (EMC) is sought.
 - b. If the EMC approves, then they can send a request to the N. C. Utilities Commission that they, the NCUC, incorporate the terms of the agreement into the certificate of convenience and necessity which the utility must obtain. In the case of a nuclear facility, the EMC may also request the Nuclear Regulatory Commission to incorporate the terms into its construction permit.
 - c. If the EMC does not approve, it may do either of the following:
 - a. Declare a capacity use area, forcing the utility to begin the process of obtaining a permit under the capacity use law.

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- b. Issue a special order under section 13(d) of the Water Use Act of 1967 which would place limitations upon the withdrawals by the utility.
 - d. If no agreement is reached between the water resources planning officials and the utilities, the State can take actions under (c) above or send its own recommendations to the NCUC (and the NRC) for the incorporation into the certificate and licenses, or participate in the construction permit hearings of nuclear power plants.
- 7. The State may also intervene, in the case of nuclear power plants, in the construction permit hearings as specified in NRC regulations (10 CFR 2, Section 2.715(c)).

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Appendix C

State of Wyoming
Procedures for Obtaining a Water Right

849226

*State Engineer's Office*

BARRETT BUILDING

CHEYENNE, WYOMING 82002

WYOMING WATER PLANNING PROGRAM

February 3, 1977

M E M O R A N D U M

TO: George L. Christopulos
Frank J. Trelease

FROM: A.J. Mancini

SUBJECT: Information on obtaining a water right, for ICWP

Much of the information in this memo is taken from the publication, Brief Summary of Wyoming Water Law, Bulletin 531R, dated February, 1974, by the Agricultural Extension Service.

Steps for Obtaining a Water Supply in Wyoming

Water is state property--this is so stated in the Constitution of the State of Wyoming (Article 8). The Constitution further states that there shall be a state engineer, and he shall have general supervision of the waters of the state and of the officers connected with its distribution. Water uses are administered under the doctrine of prior appropriation. Wyoming's first surface water laws were enacted in 1975. More comprehensive laws were adopted along with a State Constitution in 1890.

Anyone who wants to use water in Wyoming must apply to the State Engineer for a permit. A permit must be secured before work begins; this applies both to surface water and groundwater.

The procedure for obtaining a right to use surface water (water right) is generally as follows:

1. Apply to the State Engineer, on form or forms provided.
2. A qualified engineer or surveyor must prepare maps and plans to be submitted with the application.
3. The package of forms, plans and maps is submitted, along with a \$2 filing fee, to the State Engineer. (A date of priority is established by the date of receipt in the State Engineer's Office.)
4. A permit to develop water will be issued, when and if the State Engineer approves the application.

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5. The permittee must notify the State Engineer, on appropriate forms, of the dates construction began and was completed, and when water was put to beneficial use. Construction, completion and beneficial use must be made within times specified on the approved permit. Extensions of time can be requested, and may be granted, without changing the date of priority.

6. After beneficial use has been made or a reservoir constructed, and forms mentioned above have been submitted to the State Engineer, a final proof of appropriation or construction is submitted to the Board of Control. The proof is advertised in the local newspaper, and an inspection of the water development project is made. If everything is in order and no protests are filed, a Certificate of Appropriation or of Construction is issued by the Board of Control and recorded in the office of the county clerk, in the county in which the project is located. This is evidence of an adjudicated water right.

The State Engineer may issue a permit for water storage and spring development, through the filing of a simplified form which does not require maps and plans prepared by a registered engineer or surveyor.*

Groundwater laws were first enacted in Wyoming in 1945 and amended in 1947. These laws were repealed and replaced by a new set of laws which went into effect March 1, 1958. Further major amendments were made in 1969, followed by changes in later years.

The same general procedures followed for surface water rights apply to acquiring groundwater rights:

1. There are specific forms which must be used.
2. Before a well is drilled an application must be filed and approved.
3. An application to drill in a Control Area, so designated by the Board of Control, may not be approved.
4. The construction of a well must be started within a year after the permit has been granted, and completed and water applied to beneficial use by dates specified in the permit. Extensions of time can be requested and may be granted.
5. A plat, certified by a qualified engineer or land surveyor, is required at the time of filing the final proof of appropriation and beneficial use.
6. Upon filing the proof, the user will be issued a certificate of appropriation by the Board of Control. This is evidence of an adjudicated water right.

*The simplified form is used as specified on page 5 of Bulletin 531R, by the Agricultural Extension Service, University of Wyoming, Laramie.

7. A well location may be changed without loss of priority.

8. Priority of wells:

- a. For all wells drilled prior to April 1, 1947, the priority date is the date the well was completed if the well was filed within the time allowed by law (statement of claim).
- b. Between April 1, 1947, and March 1, 1958, the date the well was registered established its priority (well registration).
- c. After March 1, 1958, the priority date is the date the application for permit to drill the well is received in the State Engineer's Office.
- d. An exception to a, b, and c above is a well used solely for domestic and livestock purposes. These wells, until enactment of the 1969 amendment to the groundwater law, were exempted from filing and held priority over wells used for other purposes.
- e. Under the 1969 amendment all domestic and/or livestock wells drilled after May 24, 1969, and all wells drilled for other purposes establish a priority as of the date the application for permit to drill is received in the State Engineer's Office.
- f. Under the 1969 amendment for all domestic and livestock wells drilled and used before May 24, 1969, the water user was allowed to establish a priority date as of the time of completion and use if such wells were registered with the State Engineer by December 31, 1972.
- g. Wells used solely for domestic and livestock purposes have priority over wells for all other purposes.

9. Hot water and geothermal steam are defined by statute as underground water (groundwater), and are considered as such for the purpose of administration. A permit to appropriate groundwater must be obtained from the State Engineer, to explore for geothermal steam or hot water, or before geothermal steam or hot water can be utilized.

Surface waters and underground waters are subject to an order of preferred uses, in the following order (higher to lower):

1. Water for drinking purposes for both man and beast.
2. Water for municipal purposes.

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3. Water for use of steam engines and general railway use, water for culinary, laundry, bathing, refrigerating (including the manufacture of ice), for steam and hot water heating plants, and for steam power plants.

4. Industrial purposes.

All other uses are considered non-preferred.

A groundwater right may be declared abandoned under the same procedure as specified for a surface water right: A water right which has not been used for five successive years is considered abandoned but a statutory procedure must be followed to bring about legal abandonment.

To keep a water right valid if changes are to be made in the point of diversion, location of a well, etc., permission to make the change must be secured from the State Engineer and/or State Board of Control. Permission is requested by filing a prescribed petition. In most instances the date of priority will not be affected.

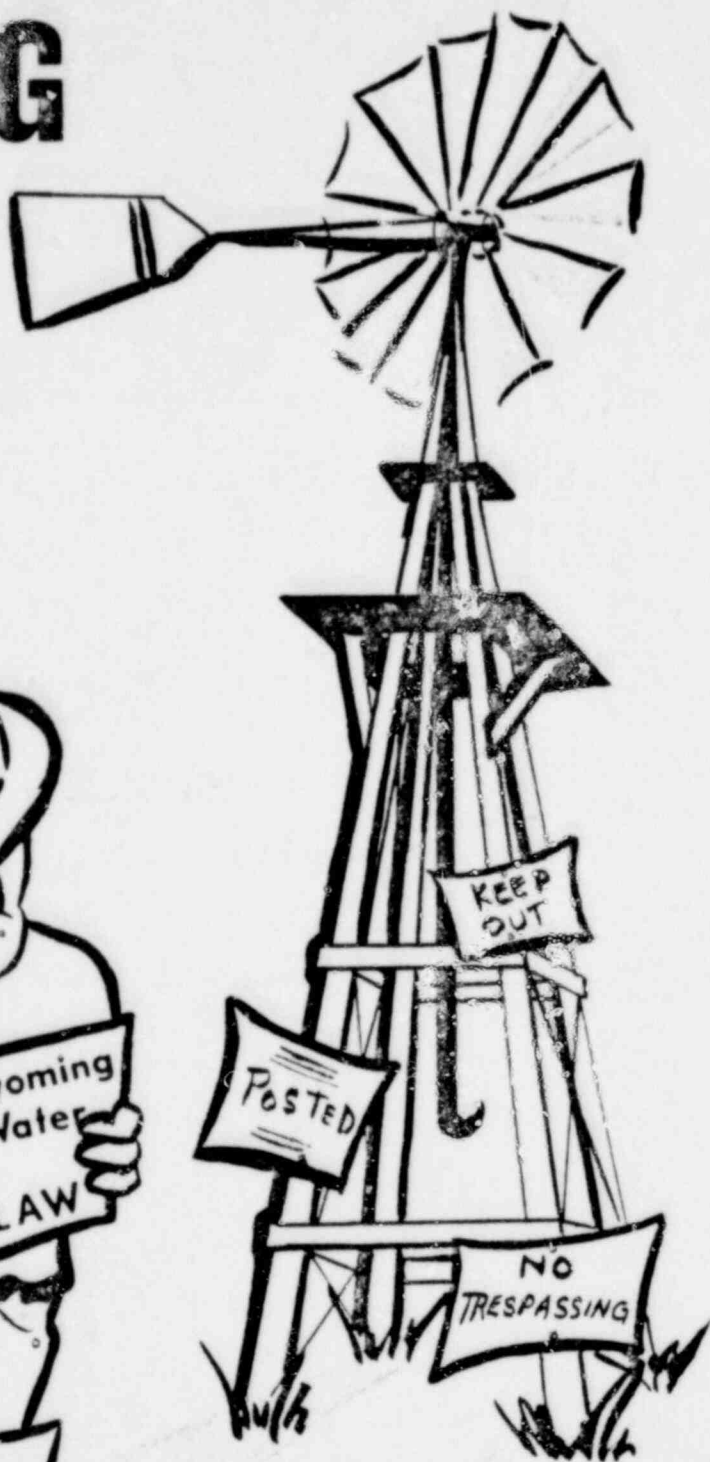
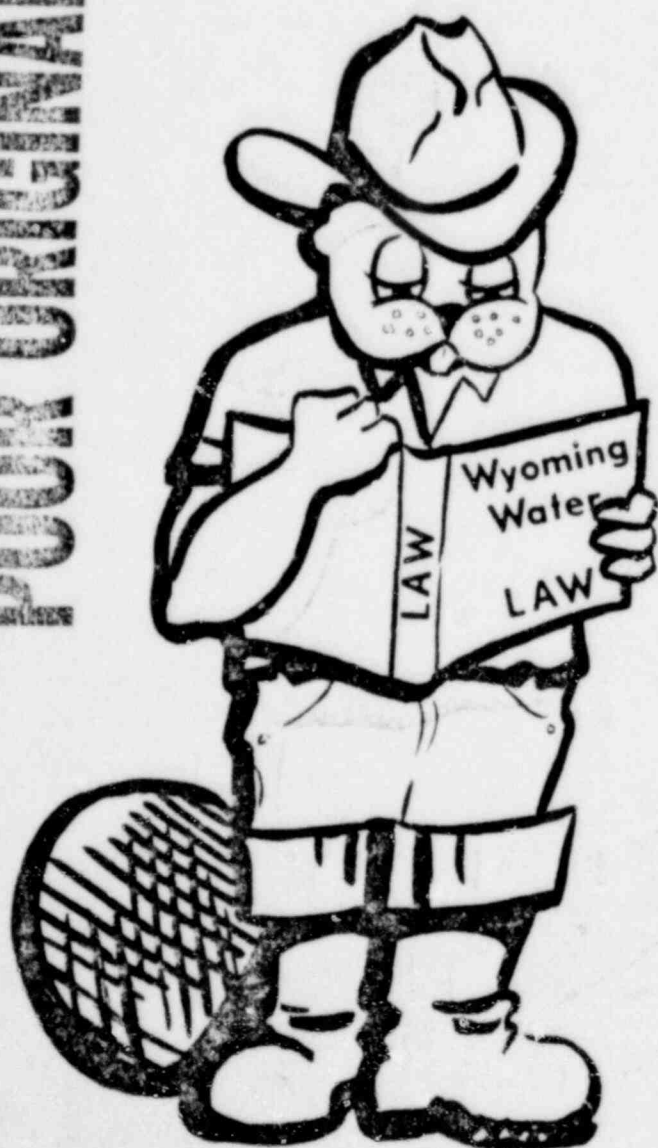
More recently the State Engineer has implied that, for any large water-using facility such as a nuclear power plant, the proposed water supply would be subjected to considerations enumerated by provisions of the Wyoming Water Development Act, to wit: Multipurpose water development; availability of water for other potential users; public interest; protection of the health, safety, and general welfare of the people of the State of Wyoming; and others.

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BRIEF SUMMARY OF WYOMING WATER LAW

POOR ORIGINAL



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BULLETIN 531 R

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FEBRUARY 1974

AGRICULTURAL EXTENSION SERVICE

UNIVERSITY OF WYOMING, LARAMIE

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The Wyoming Agricultural Extension Service is an equal opportunity educational organization.

Issued in furtherance of Agricultural Extension Work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Neal W. Hilston, Dean and Director, Agricultural Extension Service, University of Wyoming, Laramie 82071. 10-70-5M-6 2-74-5m-8

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BRIEF SUMMARY OF WYOMING WATER LAW

Donald J. Brosz, George L. Christopoulos, and Robert D. Burman ¹

FEBRUARY 1974

Wyoming water law dates back to Territorial days and is based on the theory of "prior appropriation." Under this theory the first to use the water has the best right. Therefore all water rights in Wyoming, and in most of the Western States, are regulated by priority with the earliest rights entitled to water during periods of limited supply, and those with later rights being denied water during these times.

Prior to statehood a water right could be established by simply using the water. Since statehood, however, the only way a water right can be acquired in Wyoming is by securing a permit from the State Engineer.

The Wyoming Constitution provides that water of all natural streams, springs, lakes or other collections of still water in the State are the property of the State.

Water Administration

The State Engineer administers waters of Wyoming. The state is divided into four water divisions. Water Division No. 1 includes the North and South Platte river drainages and the Little Snake and the Niobrara river drainages. Water Division No. 2 includes all drainages north of the Niobrara and North Platte river drainages and east of the Big Horn Mountains. Water Division No. 3 includes the Big Horn and Clark's Fork river drainages and Water Division No. 4 includes the Green, Bear and Snake river drainages. A Wyoming map showing the divisions is found on page 7.

A water division superintendent administers the waters of each water division. These four superintendents and the State Engineer constitute the State Board of Control. The Board meets semi-annually to adjudicate or *finalize* water rights and to consider other matters pertaining to water rights such as change in point of diversion, or amendment or correction of water rights.

When writing the State Engineer for necessary forms and information, address correspondence to State Engineer's Office, State Office Building, Cheyenne, Wyoming 82002.

Much information can be obtained from each of the water division superintendents' offices, which are presently located in the following Wyoming cities.

Water Division No. 1:

Earl Michael
511 West 27th
Torrington 82240

Water Division No. 3:

DeVere Hinckley
Box 101
Cowley 82420

Water Division No. 2:

Paul J. Kawulok
Courthouse
Sheridan 82801 (Office)
Box 58
Story 82843 (Home)

Water Division No. 4:

John Teichert
Box 347
Cokeville 83114

Preferred Uses

Wyoming water law defines the preferred uses of water and lists them in the following order:

1. Water for drinking purposes for both man and beast.
2. Water for municipal purposes.
3. Water for use of steam engines and general railway use, water for culinary, laundry, bathing, refrigerating (including the manufacturing of ice), for steam and hot water heating plants, and for steam power plants.
4. Industrial purposes.

¹Extension Irrigation Engineer, University of Wyoming; Deputy State Engineer, Cheyenne, Wyoming; and Professor, Agricultural Engineering, University of Wyoming, respectively.

Non—Preferred Uses

All uses of water other than those listed as preferred uses are considered as non-preferred.

Relationship Between Preferred and Non—Preferred Uses

When only a limited water supply is available, rights with a preferred use do not take precedence over a non-preferred use. The priority of a water right, preferred or non-preferred, determines who is entitled to water. The only way that a preferred right can take water from a non-preferred prior right is by condemnation through court action or by purchase.

Example

An irrigation water right (non—preferred use) with an early priority is entitled to use water even when it may involve denying water to a municipality (preferred use) with a later right. The municipality may acquire, through condemnation if necessary, the earlier irrigation right and change it to municipal use, provided due compensation is paid.

Abandonment of a Water Right

A water right for surface or ground water which has not been used for five successive years is considered abandoned but a statutory procedure must be followed to bring about legal abandonment. The law provides a procedure for abandonment by an affected water user(s) or by the State Engineer. If a right is declared abandoned, the user forfeits all water rights, easements, ditch rights, and the like and the water again becomes subject to appropriation.

Surface Water

Wyoming's first surface water laws were enacted in 1875. More comprehensive laws were adopted along with the State Constitution in 1890. In brief, these laws state:

- 1** Any person, association, or corporation wanting to use surface water must first apply to the State Engineer for a permit. Application forms are available from the State Engineer's Office.
- 2** An engineer or surveyor, qualified to practice under Wyoming law, must make a survey and prepare the maps and plans necessary for application. Generally this engineer or land surveyor also has the necessary application forms.

3 The application form, maps and plans, and a \$2 filing fee are submitted to the State Engineer as a package. The priority date is established by the date of receipt in the State Engineer's Office.

4 Upon approval of the application the State Engineer issues a permit for developing the proposed water project.



5 Construction, completion and beneficial use of the project must be made within the time specified on the approved permit.

6 The permittee must notify the State Engineer on appropriate forms of the dates construction began, when construction was completed, and when water was put to beneficial use. The appropriate forms are provided with the approved permit.

7 If the permittee cannot begin, complete, and/or put the water to use in the time prescribed, he may ask the State Engineer to extend any or all of the time limits. He must cite good cause for needing an extension and request it before the original time limits expire. If a time extension is granted, the date of priority remains the same.

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8 After the beneficial use of water has been made or a reservoir constructed and the notices as outlined in item 6 submitted, a final proof of appropriation or construction is submitted to the Board Control. This proof is advertised in the local newspaper and an inspection of the project made. If everything is found in order and no protests are filed, a Certificate of Appropriation or of Construction is issued by the Board and recorded in the county clerk's office in which the project is located. This is evidence of an adjudicated water right.

- 9** Limits of water for irrigation:
- a. Water rights with priorities dated March 1, 1945 and after are entitled to one cubic foot per second flow for each 70 acres of land irrigated.
 - b. Water rights with priority dates on and before March 1, 1945 are entitled to one cubic foot per second flow per 70 acres and up to an additional one cubic foot per second flow per 70 acres during periods of surplus flow as determined by the local water commissioner.

Simplified Forms

The State Engineer may issue a permit for water storage and spring development, through the filing of a simplified form, which does not require maps and plans prepared by a registered engineer or surveyor for the following water uses:

- 1** Construction of small reservoirs for stock purposes only and fishing reserve waters, where the capacity of such a reservoir does not exceed 20 acre-feet of water or the height of dam does not exceed 20 feet.
- 2** Construction of flood detention dams storing 50 acre-feet of water or less and does not exceed a dam height of 20 feet and has a minimum outlet of 18 inches in diameter and the dead storage does not exceed 20 acre-feet of water.
- 3** Development of springs for stockwater purposes of up to 25 gallons per minute. Another section of Wyoming's Water Law (41-121.1) states that springs developed for domestic and stock water supplies yielding 25 gallons per minute or less shall be considered as ground water. Adjudication or finalization of such springs are to be done according to the ground water laws which does require a registered engineer or surveyor. In spring development the user has a choice whether he wants to use the simplified form or not.

Ground Water

The first Wyoming ground water laws were enacted in 1945 and amended in 1947. A new ground water law went into effect March 1, 1958 repealing and replacing the 1945 and 1947 laws. Further major amendments were made in 1969.

Priority of Wells

- 1** For all wells drilled prior to April 1, 1947, the date of priority is the date the well was completed if the well was filed within the time allowed by law.
- 2** Between April 1, 1947 and March 1, 1958, the date the well was registered established its priority date.
- 3** After March 1, 1958, the priority date is the date the application for permit to drill the well is received in the State Engineer's Office.
- 4** An exception to the above is a well used solely for stock and for domestic purposes. These wells, until enactment of the 1969 amendment to the ground water law, were exempted from filing and held a priority over wells used for all other purposes.
- 5** Under the 1969 amendment all domestic and/or stock wells drilled after May 24, 1969, and all wells drilled for other purposes establish a priority as of the date the application for permit to drill is received in the State Engineer's Office.
- 6** Under the 1969 amendment for all stock and domestic wells drilled and used before May 24, 1969, the user was allowed to establish a priority date as of the time of completion and use if such wells were registered with the State Engineer before December 31, 1972.



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Domestic and Stock Wells

Ground water used solely for domestic and stock purposes have priority over wells for all other uses. Domestic use is defined as household use, including the irrigation of lawn and garden under one acre. These preferred rights are limited to a yield of 25 gallons per minute.



Procedures For All Wells

The same general procedures as followed for surface water rights apply to acquiring a ground water right.

- 1** Before a well is drilled, an application must be filed with and approved by the State Engineer. This requirement applies to all wells used for any purpose.
- 2** Forms to be filed with the State Engineer are available from his office, the water division superintendent, or from the county clerk's office.
- 3** A permit to construct a well will generally be granted as a matter of course by the State Engineer except in a control area. The Board of Control may designate a control area where *a*) the use of ground water is approaching a use equal to the current recharge rate, or *b*) ground water levels are declining or have declined excessively, or *c*) conflicts between users are occurring or foreseeable, or *d*) the waste of water is occurring or may occur, or *e*) other conditions require regulation in the public interest.
- 4** The construction of a well must be started within a year after the granting of a permit, and completed and water applied to beneficial use before the dates specified on the permit.

- 5** If construction of a well cannot be started, completed and/or water put to use in the time prescribed, the State Engineer may be asked to extend the time for good cause.
- 6** A plat, showing the location of the wells and the point(s) of use and distribution system, is required at the time of filing the final proof of appropriation and beneficial use. This plat must be certified by an engineer or land surveyor licensed to practice in Wyoming.
- 7** Upon filing final proof of appropriation, the user will be issued a certificate of appropriation by the Board of Control. This is evidence of an adjudicated water right.
- 8** A well location may be changed without loss of priority, provided the approval of the State Engineer is obtained in the case of unadjudicated wells, and of the State Board of Control in the case of adjudicated wells.
- 9** Ground water is subject to the same order of preferred uses as provided for surface waters, as discussed under the sections "Preferred Uses" and "Non-Preferred Uses" (pp. 3 and 4).
A water right for a well may be declared abandoned under the same procedures as specified for surface water abandonment of a water right (p. 4).

Keeping a Water Right Valid

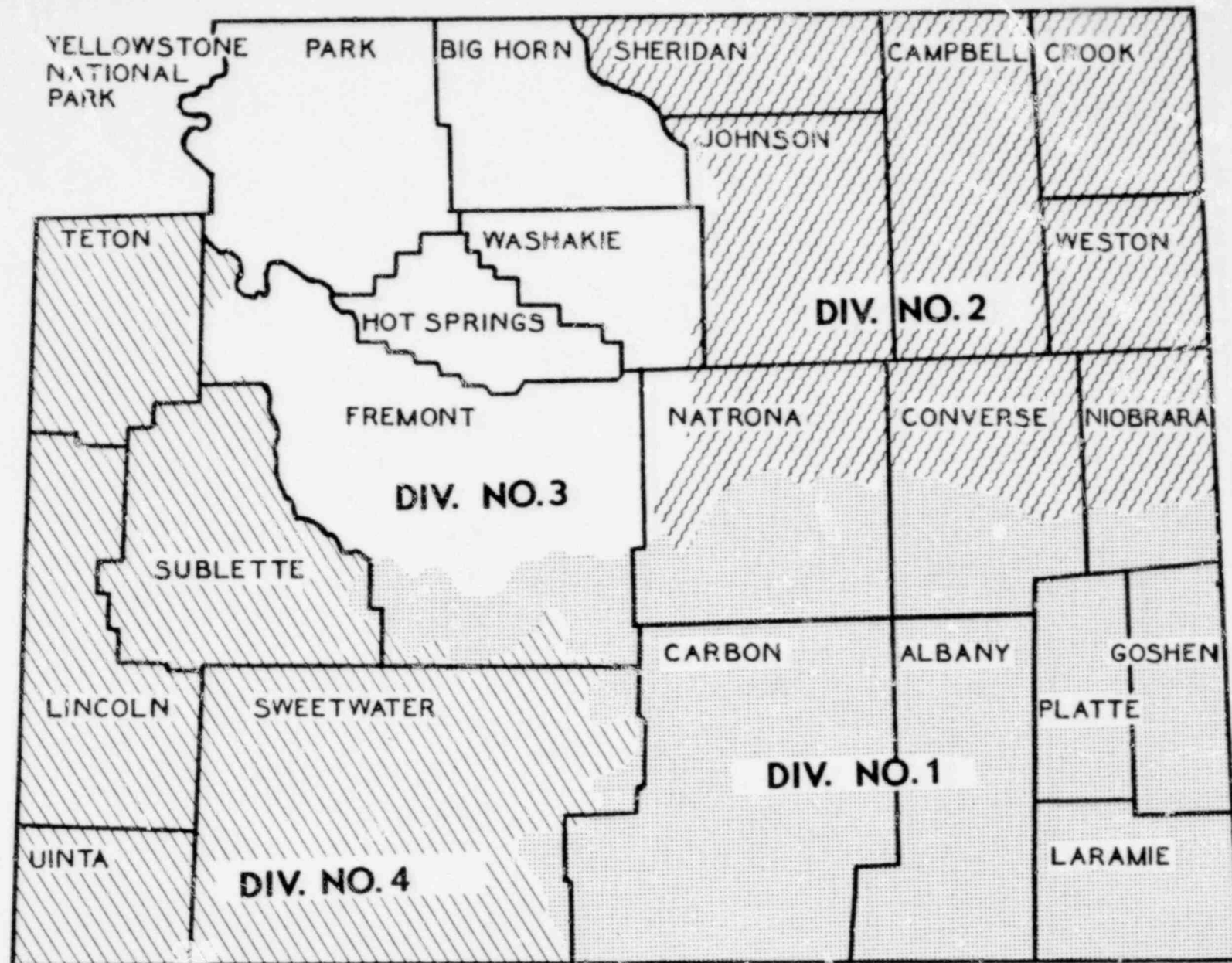
To keep a water right valid if changes are to be made in the point of diversion, in the location of a well, or in the location of an irrigation ditch, or other such changes, permission must be secured from the State Engineer and/or State Board of Control. Permission is obtained by filing a prescribed petition. In most instances obtaining permission for changes will not change the priority date of the water right but it will keep the water right up to date and legal. It is important that the water right be kept in proper standing so there will be no legal questions raised as to the validity of a right.

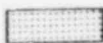
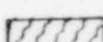
Summary

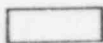

In Wyoming a valid right to the use of water may be acquired only by following the procedures established by state law for both surface and ground water.

Water users should be sure of the status of their water rights. The user can check the records in the office of the county clerk, or through the State Engineer's Office. The records will indicate the amount of the appropriation, priority of the right, and how and where the water is to be used. If there are any questions, a user should check with the State Engineer's Office in Cheyenne and request complete information on the status of the water right in question.

849 202



DIVISION NO.1 
 DIVISION NO.2 

DIVISION NO.3 
 DIVISION NO.4 

849 203

849 203

REGULATIONS AND INSTRUCTIONS FOR PREPARING
AND FILING WATER RIGHT APPLICATIONS
AND ACCOMPANYING MAPS

Procedure for Obtaining a Water Right :

The law requires that an application must be filed and permit secured from the State Engineer before work begins.

I. Survey and preparation of maps and plans by an engineer or surveyor, qualified to practice under the laws of Wyoming.

II. Filing of application, maps, plans and required \$2.00 filing fee with State Engineer. The priority of the right will date from the time the filing is accepted.

III. Examination, corrections or alteration if necessary, and approval by State Engineer as a permit.

IV. Commencement of construction work within time allowed in permit, and notice to State Engineer of compliance therewith.

V. Completion of construction work within time allowed in permit, and notice to State Engineer that said work has been completed.

VI. Completion of application of water to the beneficial use described in permit, within time allowed therein, and notice to State Engineer of compliance therewith.

NOTE: If it is not possible to commence, complete construction or complete the application of water to beneficial use within the time limits set out in the permit, the permittee should request the State Engineer to grant, for good cause, an extension of time in which to fulfill these requirements. Such request must be filed before the date of expiration of such time periods as shown in the permit.

VII. Submission before Division Superintendent or State Engineer of proof of appropriation of water to beneficial use, or proof of construction of reservoir.

VIII. Issuance and recording of a certificate of appropriation or a certificate of construction by State Board of Control which is evidence of an adjudicated water right.

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INSTRUCTIONS FOR FILING APPLICATION
for
STOCK RESERVOIRS
using
FORM SW-4 ONLY
or
Aerial Photograph or U.S.G.S. Quad. Map and Form SW-4

Procedure for obtaining a water right for a stock reservoir not to exceed 20 acre-feet in capacity or 20 feet in fill height.

The law requires that an application must be filed and permit secured from the State Engineer before work begins.

- I. APPLICATION - Use Form SW-4 and complete all items on page 1. (Use attached sample as a guide.) NOTE: Stock Pits are stock reservoirs. Do not alter the wording on the application to read "Stock Pits"
 - a) In Item 6----A surveyed corner tie is not required but should be provided if such information has been determined. However, the location of the stock reservoir by proper 40-acre subdivision, section, township and range, must be specified.
 - b) If a supply ditch or other facility is to be used to fill or to furnish additional water from another source for the stock reservoir, a separate application for this facility will be necessary and the services of a licensed engineer or land surveyor will be required.
- II. MAP - Form SW-4 Only---Page 2 of the form may be completed in accordance with the sample maps attached hereto:
 - a) Location Map---Show the section, township and range, in which the stock reservoir is located. Locate the reservoir in the proper 40-acre subdivision. Show an outline of the high-water line of the reservoir, drawn as nearly to scale as possible, and give the name of the stock reservoir. Show the location and direction of flow of the channel on which the stock reservoir is located and give the name of the stream. The complete course of all streams within the section must be shown and identified by name, if such name is known. If a corner tie is furnished, it must be shown on the Location Map.
 - b) Area Map---In the blank space below the Location Map and the Cross Section of Dam, show a scale drawing, drawn to the largest scale possible in the available space, including the outline of the dam, high-water line, and area of the reservoir. Show the location and direction of flow of the stream channel and its name. This Area Map should be oriented to conform with the Location Map. Show the location and extent of the overflow spillway, including the bottom width. The Area Map should show the scale of the drawing, and a "north arrow" which normally should be directed toward the top of the sheet. When applicable, the outlet pipe and corner tie should be shown.

NOTE: If a supply ditch or other facility is to be used to fill or to furnish additional water from another source for the stock reservoir, such facility must be shown and identified by name on the Location Map and Area Map.

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- c) Cross Section of Dam----Show the height of the dam, top width, elevation of the high-water line, slope of front and back faces, and the amount of freeboard. When an outlet pipe is to be used, give the diameter of the pipe.
- d) Profile of Damsite----Show a complete profile, including: top of dam, high-water line, location and size of outlet pipe; spillway and its bottom width; and appropriate elevations, including the low point of the profile. The vertical elevations and horizontal scale must be shown.
- e) Capacity----Complete the capacity formula shown on the application form by filling in the area and depth; then compute the capacity by multiplying the area times the depth and dividing by 3. The water depth used in this computation should be the maximum depth of water in the reservoir basin. This is usually the difference in elevation between the low point on the profile of the damsite and the high-water line.
- f) Enlargements----If the application is for enlargement of an existing stock reservoir, a capacity table, setting forth the capacity of the existing stock reservoir and the capacity of the enlargement, must be shown and may be placed within the blank space provided for the Area Map. Enough information must be furnished to clearly indicate the physical changes necessary to accomplish the enlargement; i.e., show the reservoir as it exists and the proposed enlargement.
- g) The statement of declaration must be signed and dated by the applicant or his agent, whose name must appear the same on the first line of the opening statement of the application as in the signature of declaration.
- h) For pit type stock reservoirs the following exceptions apply:
 - (1) The Area Map should show the top dimensions, bottom dimensions, depth, capacity computations, and surface area computations. The formula used to compute capacity and area is shown on sample map for stock pit attached hereto.
 - (2) The Profile of Damsite should be changed to Section A-A of the pit. Show a complete profile of the pit, including the high-water line elevation at top of ground, and the bottom elevation. The Section A-A of the pit should also include the horizontal scale, vertical elevation scale, and stationing.

III. MAP - Using aerial photograph or U.S.G.S. quadrangle map in conjunction with information required on Page 2 of the Form SW-4.

- a) The Location Map and Area Map on the second page of the application form, are not required if the application is accompanied by a U.S.G.S. quadrangle map or contact print of an aerial photograph. Preferred size is 9" x 9", however, 8" x 10" size will be acceptable. Sample map attached.
- b) Minimum acceptable scale - 2" = 1 mile.
- c) Preferred scale:
 - (1) Aerial Photographs - 4" = 1 mile.
 - (2) U.S.G.S. quadrangle maps - 1:24000 (1"=2000')
- d) The scale must be shown.
- e) A North Arrow must be shown - orient so that the top of the map is North.

- f) When any part of a section is involved, the entire section, subdivided into forties, lots, tracts, homestead entries, must be shown and properly identified including the section number, township and range.
- g) A corner of the public land survey must be identified on the ground and accurately shown on the photograph or quadrangle map. Such corner should be the nearest available corner to the facility involved.
- h) The location of the stock reservoir must be accurately shown within the proper 40-acre subdivision or subdivisions.
- i) The aerial photograph or U.S.G.S. quadrangle map must show the outline of the submerged area of the stock reservoir, the name of the reservoir, name of the stream upon which the reservoir is located and the names of other streams involved.
- j) The name of the stock reservoir should be shown on the lower right hand corner of the map, and adequate space for stamping permit number and State Engineer's endorsement must be provided.
- k) The aerial photographs or U.S.G.S. quadrangle maps need not be certified by a licensed engineer or land surveyor, but the statement of declaration on the application must be signed by the applicant or his agent.

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STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

APPLICATION FOR PERMIT TO APPROPRIATE SURFACE WATER

THIS SECTION IS NOT TO BE FILLED IN BY APPLICANT

Filing/Priority Date

THE STATE OF WYOMING, }
STATE ENGINEER'S OFFICE } SS.

This instrument was received and filed for record on the _____ day of _____, A.D.
19_____, at _____ o'clock _____ M.

State Engineer

Recorded in Book _____ of Stock Reservoirs, _____ on Page _____.

Fee Paid \$_____. Map Filed _____.

WATER DIVISION NO. _____ 2 _____ DISTRICT NO. _____ 10 _____ Temp.
Filing No. _____

PERMIT NO. _____ STOCK RESERVOIR

NAME OF FACILITY

THE _____ COTTONWOOD _____ STOCK RESERVOIR

1. The name(s) and complete mailing address(es) of the applicant(s) is/are _____
William S. Doe
Box 13, Ridge Route
Deer Junction, Wyoming 80000

(If more than one applicant, designate one to act as Agent for the others)

2. Name & address of agent to receive correspondence and notices: applicant

3. The use to which the water is to be applied is stock watering purposes.

4. (a) The area of the high water line of the reservoir is 1.62 acres.

(b) The capacity of the reservoir is 5.40 acre-feet.

(c) Body of Reservoir: Length 330', Width 214' and Average Depth 3.33'.

5. The source of the proposed appropriation is Johnson Draw, tributary of Swamp Creek,
tributary of Belle Fourche River, which is a tributary of Cheyenne River.

6. The outlet of the proposed reservoir is located N. 66° 0' W. 3075 feet distant
from the SE Corner of Section 6 T. 46 N. R. 70 W. and is in the
SE 1/4 of Section 6 T. 46 N. R. 70 W.

7. Are any of the lands covered by the proposed reservoir owned by the State or Federal Government? If so, describe lands and
designate whether State or Federally owned.

N/A

8. Fill out either (a) or (b)

(a) The reservoir is located in the channel of Johnson Draw

(b) The reservoir is to be filled through the _____

Canal, which has a carrying capacity of _____ cubic feet per second.

9. (a) The dam is to be constructed as follows: Earth fill watered and compacted
Contents: 5.625 Cubic Yards.

(b) The water face of the dam is to be protected from wave action in the following manner:

Rock riprap 1' thick

10. The accompanying map is prepared in accordance with the State Engineer's Manual of Regulations and Instructions for filing
applications and is hereby declared a part of this application.

* 11. The estimated time required for completion of Construction is 1 year.

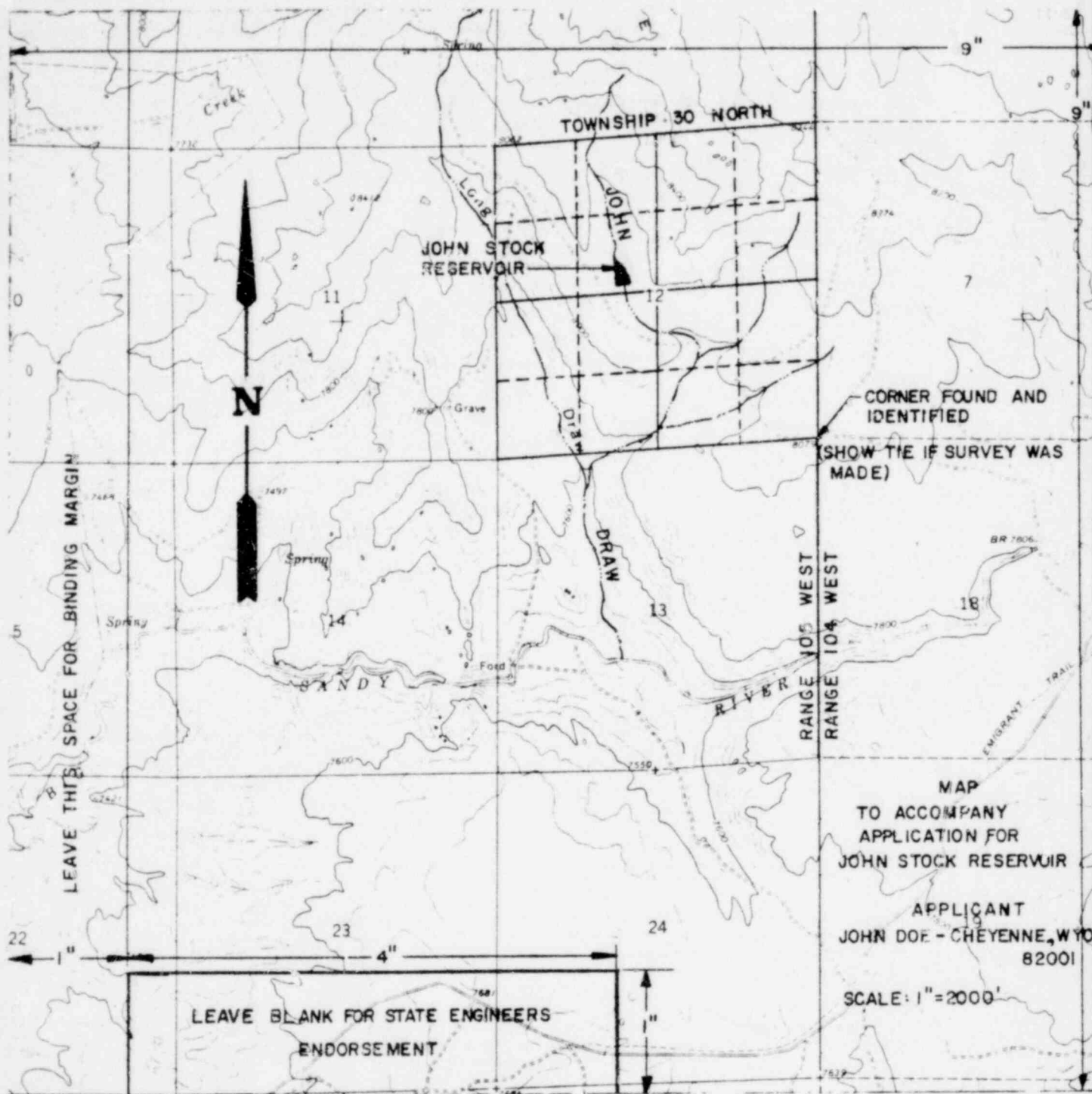
*NOTE: This information is for the benefit of the State Engineer in setting the
expiration date for completion of construction.

Permit No. _____ Stk. Res.

Page No. _____
(Leave Blank)

849 208

ORIGINAL
POOR

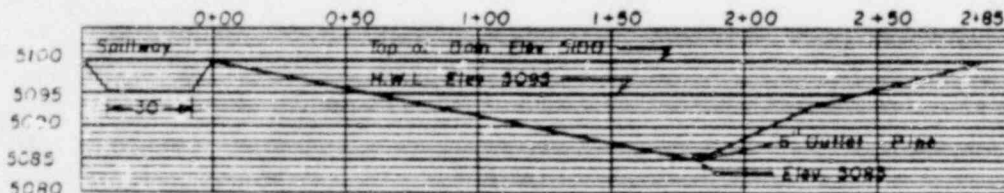


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MAP AND PLANS OF PROPOSED COTTONWOOD STOCK RESERVOIR



NOTE 1

DECLARATION

May 15, 1971

849 210

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MAP AND PLANS OF PROPOSED _____ LONE TREE _____ STOCK RESERVOIR



See NOTE 1

150'

70'

70'

150'

DEPTH = 10'

Draw

Canyon

Box

North Arrow

Scale: 1" = 100'

SURFACE AREA

$$\frac{22,500}{43,560} = 0.52 \text{ Acres}$$

Section AA of P.H.
Profile to Dam Site (Scale Vert. 1" = 20'; Hor. 1" = 30')

Section A-A of Pit
PROFILE IN TRANSVERSE (Scale Vert. 1" = 20'; Hor. 1" = 30')

Capacity — Area x Depth — 3 ————— 3 ————— Area Feet

NOTE 1
The location map and area map shown above are not required if the application is accompanied by an aerial photograph or a U.S.G.S. quadrangle map, in accordance with Chapter V of the Manual. However, the cross section of dam and profile of damsite must be completed in all applications.

Under penalties of perjury, I declare that I have examined this application and the information contained herein, and to the best of my knowledge and belief it is true, correct and complete, and that the location of the proposed facility is accurately shown either as shown above or on the aerial photograph or U.S.G.S. quadrangle map accompanying this application.

John Doe
Signature of Applicant or Agent

May 15, 1971
Date

POOR ORIGINAL

849 211

INSTRUCTIONS FOR FILING APPLICATION
For
SPRINGS - STOCKWATER
(Using Aerial Photographs or U.S.G.S. Quadrangle Maps)

The procedure outlined below applies only to springs flowing more than 25 GPM (0.056 CFS), and for stock water purposes only. Regardless of the total flow of the spring, the amount of appropriation for stock purposes will be limited to 25 GPM (0.056 CFS).

All springs flowing less than 25 GPM (0.056 CFS) and for stock or domestic uses only, must be filed under the ground water application procedure.

NOTE: Water must be diverted from its natural course and artificially conveyed to the point of use.

The law requires that an application must be filed and permit secured from the State Engineer before work begins.

I. Application - use Form S.W. 1 and complete:

- a) Name of Facility (Ditch, Pipeline or other conduit)
- b) Opening Statement
- c) Items 1 through 10 with the following exception:
 - (1) In Item 5 -- A surveyed corner tie is not required but should be provided if such information has been determined. However, the location of the point of diversion (spring) by proper 40-acre subdivision, section, township and range, must be shown on the application and map.

II. Map Aerial Photograph or U.S.G.S. Quadrangle Maps.

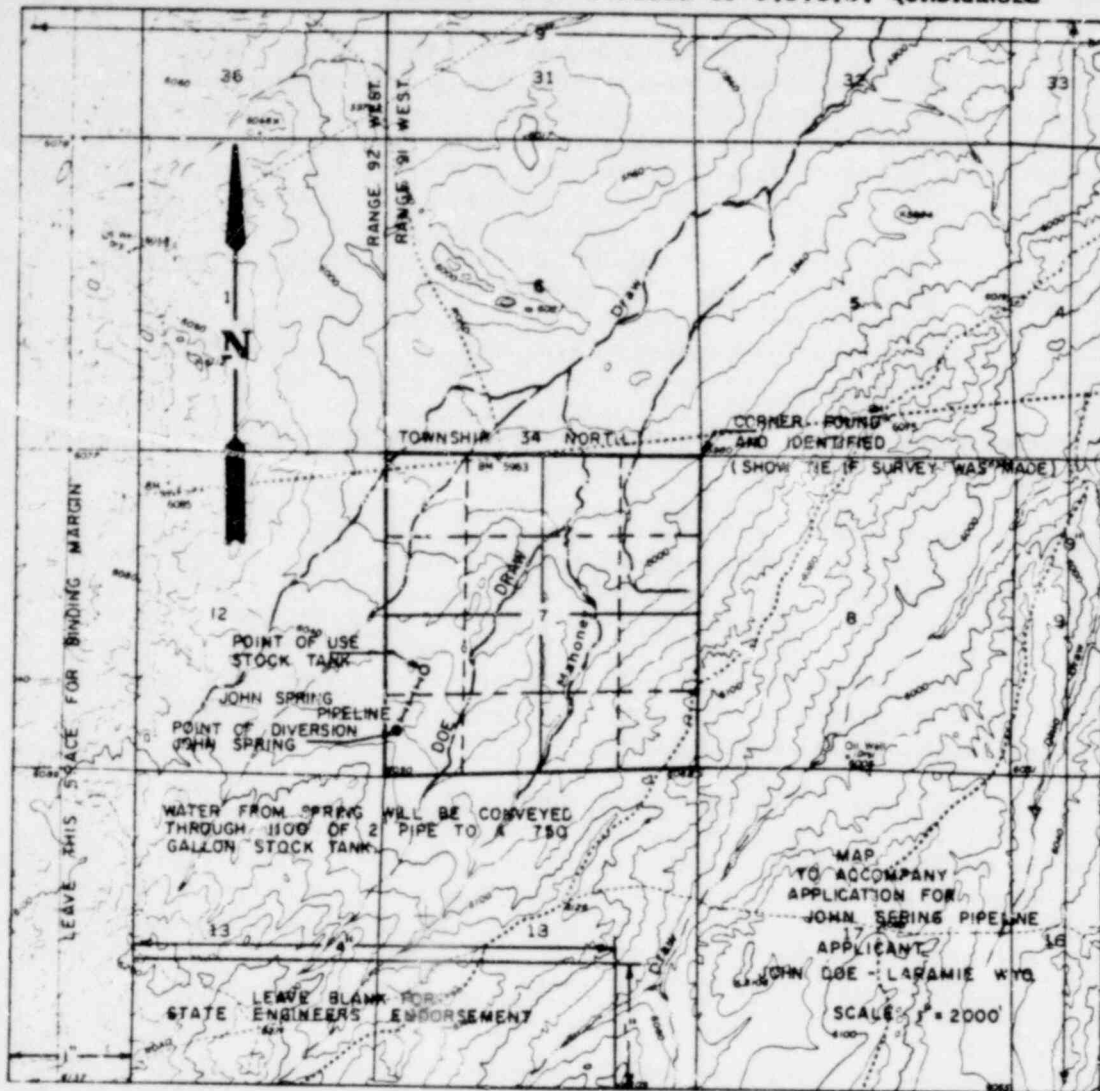
- a) Each application must be accompanied by a 9" x 9" map cut from a U.S.G.S. quadrangle map or an aerial photograph. To facilitate preparation and filing, this office requests the size of the aerial photograph or U.S.G.S. quadrangle map to be 9" x 9". However, 8" x 10" size will be acceptable. (Xerox or similar copies are not acceptable.)
- b) Minimum acceptable scale - 2" = 1 mile
- c) Preferred scale:
 - (1) Aerial Photographs - 4" = 1 mile
 - (2) U.S.G.S. quadrangle maps - 1:24000 (1" = 2000')
- d) The scale must be shown.
- e) A North Arrow must be shown - orient so that the top of the map is North.
- f) When any part of a section is involved, the entire section, subdivided into forties, lots, tracts, homestead entries, must be shown and properly identified including the section number, township and range.
- g) A corner of the public land survey must be identified on the ground and accurately shown on the photograph or quadrangle map. Such corner should be the nearest available corner to the facility involved. Show corner tie, if survey was made.
- h) The location of the facility must be accurately shown within the proper 40-acre subdivision or subdivisions.
- i) The photograph or quadrangle map must show and identify the point of physical diversion, course of artificial means of conveyance, point of beneficial use, name of spring, name of stream and names of other streams involved.
- j) The name of the facility should be shown on the lower right hand corner of the map, and adequate space for stamping permit number and State Engineer's endorsement must be provided.
- k) The aerial photographs or U.S.G.S. quadrangle maps need not be certified by a licensed engineer or land surveyor, but the statement of declaration on the application must be signed by the applicant or his agent.

SEE ATTACHED MAP
(for pictorial presentation of above requirements)

849 212

849216

SAMPLE MAP - REDUCED FROM 9" X 9" PORTION OF U.S.G.S. QUADRANGLE



PLEASE NOTE

- 1) Map must comply with all requirements under Section II of attached instruction sheet.
- 2) Do not use ball-point pens - black waterproof ink must be used for all information shown on these maps.
- 3) If an aerial photo is used, it should agree in all respects with information shown on this sample map. (Contour lines are not required on aerial photos.)

849217

849 213

SPECIAL APPLICATIONS

Section 1. Authority. Section 33-366, Wyoming Statutes 1957, as amended by Section 1, Chapter 194, Session Laws of Wyoming 1971; and Section 41-121.1, Chapter 171, Session Laws of Wyoming 1973, provide for the filing of applications with the State Engineer for facilities meeting the following limitations:

a. Stock reservoirs not to exceed 20 acre-feet in capacity or 20 feet in fill height.

b. Fishing preserve reservoirs not to exceed 20 acre-feet in capacity or 20 feet in fill height.

c. Floodwater detention reservoirs not to exceed 50 acre-feet in capacity, 20 feet in fill height, or 20 acre-feet of inactive capacity; and providing said dam has a minimum outlet of 18 inches in diameter.

d. Facilities diverting from springs where the yield does not exceed 25 g.p.m. (0.056 CFS) for stock or domestic purposes only, shall be considered as ground water and the ground water application procedure must be used.

Facilities diverting from springs where the yield exceeds 25 g.p.m. (0.056 CFS) for stock purposes only, must follow the filing procedure outlined by this Chapter, and will be limited to 25 g.p.m. (0.056 CFS).

Section 2. General Requirements.

a. Unless otherwise specified by this Chapter, all applicable requirements of this Manual shall apply.

b. Applications coming within the specified limitations in Section 1 of this Chapter, may be accompanied by aerial photographs or United States Geological Survey quadrangle maps conforming to Section 3 of this Chapter.

Section 3. Aerial Photographs or U.S.G.S. Quadrangle Maps.

a. Each application must be accompanied by an original quadrangle map or an aerial photograph. To facilitate preparation and filing, this office requests the size of the aerial photographs or U.S.G.S. quadrangle maps to be 9" x 9". However, 8" x 10" size will be acceptable. (Xerox or other similar copies are not acceptable.)

b. The minimum scale of 2" = 1 mile will be acceptable.

c. The preferred scale of aerial photographs is 4" = 1 mile.

d. The preferred scale of U.S.G.S. quadrangle maps is 1:24000, (1" = 2000').

e. The scale must be shown on all U.S.G.S. quadrangle maps and aerial photographs.

849 214

849248

f. A "north arrow" must be shown, and the U.S.G.S. quadrangle map or photograph should be oriented so that the top is north.

g. When any part of a section is involved in an application, the entire section, subdivided into forties, lots, tracts, homestead entries, etc., as applicable, must be shown and properly identified including the section number, township and range.

h. A corner of the public land survey must be identified on the ground and accurately shown on the aerial photograph or U.S.G.S. quadrangle map. Such corner should be the nearest available corner to the facility involved.

i. The location of the facility must be accurately shown within the proper 40-acre subdivision or subdivisions.

j. Streams must be identified by name.

k. The name of the facility should be shown on the lower right hand corner of the map, and adequate space for stamping the permit number must be provided. (See sample map on the last page).

l. The aerial photographs or U.S.G.S. quadrangle maps need not be certified by a licensed engineer or land surveyor, but the statement of declaration on the application and on the Reservoir Application Supplemental Sheet for filings on Form S.W. 3, must be signed by the applicant or his agent.

m. Black waterproof ink must be used for information shown on these maps. DO NOT USE BALL-POINT PENS.

Section 4. Stock Reservoirs. Applications for stock reservoirs not exceeding 20 acre-feet in capacity or 20 feet in fill height, may either be filed on Form S.W. 4, (the regular Stock Reservoir application form) in accordance with the requirements of Section 6 of Chapter V, (page 38); or such applications may be filed under the provisions of this Chapter as follows:

a. Use Form S.W. 4. Complete the form in accordance with Section 6 of Chapter V, (page 38) except for the following:

(1) The Location Map and Area Map on page 2 of the application form, are not required if the application is accompanied by an aerial photograph or U.S.G.S. quadrangle map. (See Section 3 of this Chapter).

b. The aerial photograph or U.S.G.S. quadrangle map must show the outline of the submerged area of the reservoir, the name of the reservoir, and the name of the stream upon which the reservoir is located. (See sample map on the last page).

849215

Section 5. Fishing Preserve Reservoirs. Applications for fishing preserve reservoirs not exceeding 20 acre-feet in capacity or 20 feet in fill height, may be filed on Form S.W.3, (the regular Reservoir application form) in accordance with the requirements of Section 4 of Chapter V, (page 35); or such application may be filed on Form S.W. 3 with the Reservoir Application Supplemental Sheet, Form S.W. 3-A, under the provisions of this Chapter as follows:

a. Complete the reservoir application form, Form S.W. 3 in accordance with Section 4 of Chapter V, (page 35), with the following exceptions:

(1) ITEM 5 -- "The outlet of the proposed reservoir is located" -- A corner tie is not required but should be provided if such information has been determined. However, the location of the reservoir by proper 40-acre subdivision, section, township and range, must be specified.

b. Complete all items on the Reservoir Application Supplemental Sheet. See Form S.W. 3-A.

(1) Furnish details relative to the reservoir and dam. If an item is not applicable, enter "NA".

(2) Furnish spillway details and hydraulic properties.

(3) Complete the profile of damsite.

(4) Sign and date the statement of declaration.

c. The aerial photograph or U.S.G.S. quadrangle map must show the outline of the submerged area of the reservoir, the name of the reservoir, and the name of the stream upon which the reservoir is located. (See sample map on the last page).

Section 6. Supply Ditches. If a supply ditch is to be used to fill or to furnish additional water from another source for a stock reservoir or fishing preserve reservoir, a separate application for the supply ditch will be required. Such application must be prepared in accordance with the requirements of Sections 2 and 3 of Chapter V, page 34, and shall require a linen tracing.

Section 7. Floodwater Detention Reservoirs. Applications for floodwater detention reservoirs not exceeding 50 acre-feet in capacity, 20 feet in fill height, 20 acre-feet of inactive capacity; and providing said dam has a minimum outlet of 18 inches in diameter; may be filed in accordance with the same procedure and requirements as specified for fishing preserve reservoirs in Section 5 of this Chapter.

Section 8. Springs - Stock Water Facilities.

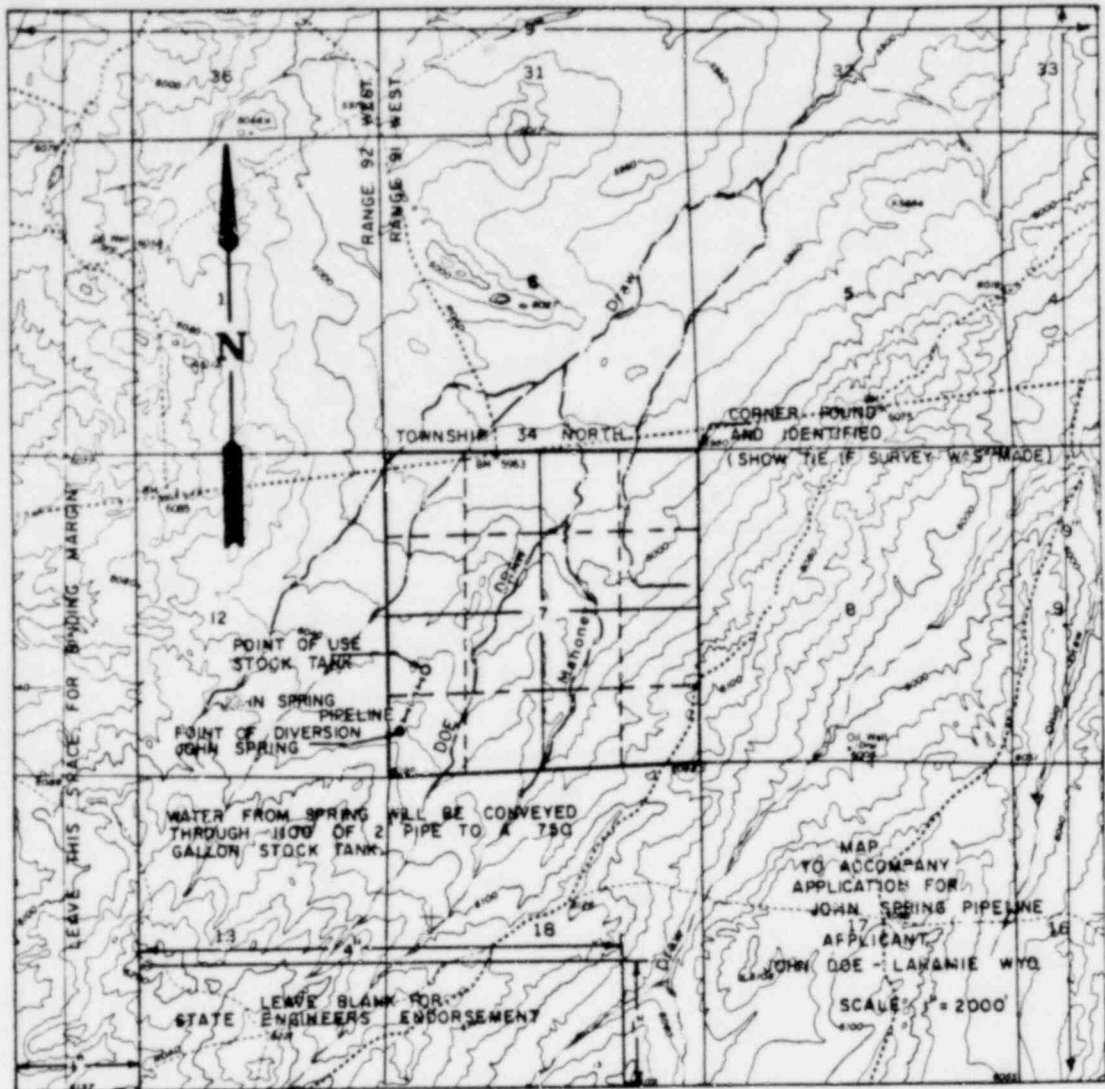
a. Use Form S.W. 1, (the regular application form for a Permit to Appropriate Surface Water). Refer to Chapter III, page 6, for general instructions. The following exception shall apply:

849250

(1) ITEM 5 -- "The point of diversion of the proposed works is located" -- A corner tie shall not normally be required. However, in the case of other springs in the immediate area, and to avoid possible conflicts, a corner tie may be necessary; therefore, serious consideration should be given to providing a surveyed corner tie at the time of initial filing. In any case, the location of the point of diversion by proper 40-acre subdivisions, section, township and range, must be specified.

b. An aerial photograph or U.S.G.S. quadrangle map may be used in place of a linen tracing map and must show and identify the point of diversion, means of conveyance, point of beneficial use, name of spring, and name of stream. (See sample map on the last page).

849251



PLEASE NOTE

- 1) Map must comply with all requirements under Section II of attached instruction sheet.
- 2) Do not use ball-point pens - black waterproof ink must be used for all information shown on these maps.
- 3) If an aerial photo is used, it should agree in all respects with information shown on this sample map. (Contour lines are not required on aerial photos.)

849 218

POOR ORIGINAL

849252

RESERVOIR APPLICATION SUPPLEMENTAL SHEET
(Use with Form S.W. 3)

for

THE BROWN

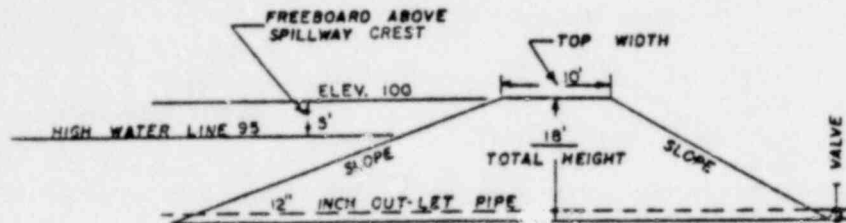
RESERVOIR

Temp.

Filing No. _____

The following information, as applicable, must be furnished when filing applications under the provisions of Chapter 194, Wyoming Session Laws, 1971. (Re: Chapter V of the Manual of Regulations and Instructions).

RESERVOIR - Details of Dam:



CROSS-SECTION OF DAM - No Scale

Depth of water below outlet 1.0

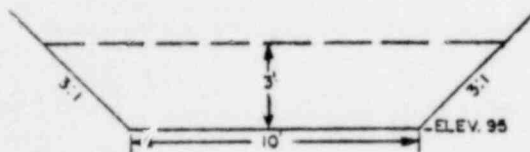
Construction Materials Clay

RESERVOIR

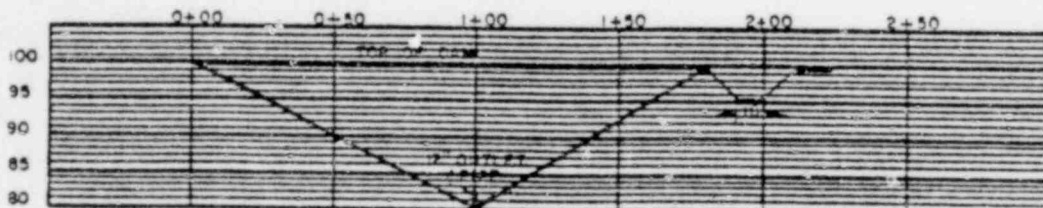
Details of body: Length 300 Width 100 Average Depth 7
Total submerged area 1.5 ac., Submerged Area below Outlet .05
Total Capacity 6.50 acre-feet, Capacity below outlet 0.02 acre-feet.

NOTE: Capacity = submerged area x water depth $\div 3$ = _____ acre-feet.

SHOW CROSS-SECTION AND HYDRAULIC PROPERTIES OF SPILLWAY IN THE SPACE PROVIDED BELOW:



A = 57 sq ft
f = 1.97
V = 2.95 f.p.s.
n = 0.025
S = 0.001
Q = 168 cfs.



PROFILE OF DAM-SITE (Scale Vert. 1" = 20' Horz. 1" = 50')

DECLARATION

Under penalties of perjury, I declare that the information shown above is true, correct and complete and that the accompanying aerial photograph or U.S.G.S. quadrangle map shows accurately the location of the proposed facility.

Joseph T. Light
Signature of Applicant or Agent

August 14, 1973
Date

Permit No. _____ Res. _____

Page No. _____

849 219
(Leave Blank)

INSTRUCTIONS FOR FILING APPLICATIONS
for
TEMPORARY USE OF WATER

The procedure outlined below applies to only those applications filed for temporary industrial purposes for: highway or railroad roadbed construction or repair, oil or gas well drilling fluid and producing operations, or other temporary purposes. The right to divert or store water for temporary purposes can be acquired by following the same procedure as for other uses or by complying with the provisions of Sections 41-10.1 and 41-10.2, Wyoming Statutes 1957 (Laws 1959), as amended by Sections 1 and 2, Chapter 193, Session Laws of Wyoming 1971.

NOTE: Water must be diverted from its natural course
and artificially conveyed to the point of use.

A temporary right is issued for a limited time only, generally only long enough to complete the temporary use, or for a 2-year period from the time of approval, whichever comes first; after which the permit is automatically cancelled. This type of right is acquired by submitting an application and map for a permit to the State Engineer. The procedure followed is generally the same as for filing applications for permits for other uses.

INSTRUCTIONS FOR COMPLETING THE APPLICATION FORM S. W. 1

1. The entry for the name of the facility should indicate if the proposed facility is to be a ditch, pipeline, water haul or other type of conveyance.
2. Show complete name and mailing address in items 1 and 2.
3. The entry in item 3(a) should be similar to the following examples:
Industrial (Oil and Gas Well Drilling Fluid)
Industrial (Highway Construction, Project No. __)
4. The entry in item 4 should name the source and show a tributary sequence.
5. The entries in item 5 should include a bearing and distance tie from a corner of the Public Land Survey to the point of diversion, if available. Also the point of use should be described within the proper 40 acre subdivision.
6. The entry in item 6 should show the ownership of the land, if Federal or State land is involved. This item is required since the State Engineer must notify the proper State or Federal offices of the application for the water right.

849 220

849254

7. The entry in item 7 should give the maximum rate at which the water will be diverted from the stream. If the water is to be hauled by truck, the capacity of the pump loading the trucks could be used.
8. Item 9: The time that the water right will be required should be shown here. This can be done by giving the total number of days required to accomplish the desired use in very temporary uses. In applications requiring up to 2 years, this item should be filled out in more detail.
9. Item 10: All points of use must be shown under this item. In highway and railroad use, each subdivision crossed by the right-of-way should be indicated. In oil and gas well drilling, the location of the well should be marked in the proper subdivision, and the oil or gas well should be identified. A statement of ownership should be shown in item 10.
10. The Remarks Section of the application should be used to supply any additional information that is not covered by items 1 through 10 of the application. If the rate of diversion, gallons per day and total number of gallons are shown in "Remarks", it is not necessary to duplicate this information on the required map.
11. The completed application should be signed and dated. Also the legally required two dollar (\$2.00) filing fee should accompany the application. (For the proper preparation of the application form, see attached sample application.)
12. Each application for a temporary use must be accompanied by a map. The required map may be on good quality tracing linen, on an original U.S.G.S. Quadrangle or on a county map with the required information added to it. The certification by a licensed engineer or land surveyor is desirable but not mandatory. A sample map is attached. (Xerox or other similar copies are not acceptable.)
13. The map that accompanies the application must describe the point of diversion, the point of use and the means of conveyance, such as pipeline, haul route, etc. (For the proper way to prepare the application map, see attached sample.) The preferred scale for the map to accompany the application is 1"=2000'.

849255

849 221

POOR ORIGINAL

Form S.W. 1
Rev. 5-73

NOTE: Do not fold this form. Use type-
writer or print neatly with black
ink.

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

APPLICATION FOR PERMIT TO APPROPRIATE SURFACE WATER

THIS SECTION IS NOT TO BE FILLED IN BY APPLICANT

Filing/Priority Date

THE STATE OF WYOMING, }
STATE ENGINEER'S OFFICE } SS.

This instrument was received and filed for record on the _____ day of _____, A.D.
19_____, at _____ o'clock _____ M.

State Engineer

Recorded in Book _____ of Ditch Permits on Page _____

Fee Paid \$ _____ Map Filed _____

WATER DIVISION NO. _____

DISTRICT NO. _____ Temp.
Filing No. _____

PERMIT NO. _____

NAME OF FACILITY XXX Company Oil Well Water Haul

1. The name(s) and complete mailing address(es) of the applicant(s) is/are XXX Company
P. O. Box 301
Cheyenne, Wyoming 82001

(If more than one applicant, designate one to act as Agent for the others)

2. Name & address of agent to receive correspondence and notices John Doe, P. O. Box 000,
Cheyenne, Wyoming 82001

3. (a) The use to which the water is to be applied is Industrial (Oil or Gas Well Drilling)

(b) If more than one beneficial use of water is applied for, the location and ownership of the point of use must be shown in item 4 of the application and the details of the facilities used to divert and convey the appropriation must be shown on the map in sufficient detail to allow the State Engineer to establish the amount of appropriation. In multiple use applications, stock and domestic purposes are limited to 0.056 cubic feet per second.

4. The source of the proposed appropriation is Jim Draw, tributary of Oil Creek, tributary
of Blank Creek, which is a tributary of Blank Blank River

5. The point of diversion of the proposed works is located S82000'W 2200 feet dis-
tant from the NE corner of section 12 T. 40 N. R. 70 W. and is in the
NW1/4NE1/4 of Section 12 T. 40 N. R. 70 W.

6. Are any of the lands crossed by the proposed facility owned by the State or Federal Government? If so, describe lands and indi-
cate whether State or Federally owned.

The NW1/4 Section 12, T 40 N, R 70 W is State land.

The SW1/4 Section 12, T 40 N, R 70 W is Federal land.

7. The carrying capacity of the ditch, canal, pipeline or other facility at the point of diversion is (50 gpm) 0.11 cubic
feet per second.

8. The accompanying map is prepared in accordance with the State Engineer's Manual of Regulations and Instructions for
filing applications and is hereby declared a part of this application. The State Engineer may require the filing of detailed con-
struction plans.

9. The estimated time required for commencement of work is 1 day for completion of construction is
60 days and to complete the application of water to the beneficial uses stated in this application is
60 days

Permit No. _____

Page 849 222
(Leave Blank)

10. The land to be irrigated under this permit is described in the following tabulation. (Give irrigable acreage in each 40-acre subdivision. Designate ownership of land, Federal, State or private. If private, list names of owners and land owned separately.) If application is for stock, domestic, or for purposes other than irrigation, indicate point of use in 40-acre subdivision and owner.

Township	Range	Sec.	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
			The following described land is Federal land, leased by the applicant for exploratory oil and gas well drilling purposes.																
40	70	12	<div style="text-align: right;"> X Point of use XXX Oil Company Oil Well No. XX </div>																
			The following described land is privately owned land, leased by the applicant for exploratory oil and gas well drilling purposes																
40	70	11	<div style="text-align: right;"> X Point of use XXX Oil Company Oil Well No. XX </div>																

Number of acres to receive original supply _____

Number of acres to receive supplemental supply _____

Total Number of acres to be irrigated _____

REMARKS

Water will be taken from the point of diversion (Jim Draw) in the NW1/4 Sec. 12, Township 40 North, Range 70 West at a rate of (50 gpm) 0.11 cfs or about 30,000 gpd for a total amount of approximately 450,000 gallons. A 40-ton truck hauled to the drilling site located in the SW1/4, Section 12, Township 40 North, Range 70 West for oil and gas well drilling purposes, within a 60-day period.

Under penalties of perjury, I declare that I have examined this application and to the best of my knowledge and belief it is true correct and complete.

Under penalties of perjury, I declare that I have examined this application
correct and complete.

John Lee
Signature of Applicant or Agent

January XX, 1974

849 223

POOR ORIGINAL

849257

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

APPLICATION FOR PERMIT TO APPROPRIATE SURFACE WATER

THIS SECTION IS NOT TO BE FILLED IN BY APPLICANT

Filing/Priority Date

THE STATE OF WYOMING, }
STATE ENGINEER'S OFFICE } SS.

This instrument was received and filed for record on the _____ day of _____, A.D.
19_____, at _____ o'clock _____ M.

State Engineer

Recorded in Book _____ of Ditch Permits, on Page _____

Fee Paid \$ _____ Map Filed _____

WATER DIVISION NO. _____ DISTRICT NO. _____ Temp.
Filing No. _____

PERMIT NO. _____

NAME OF FACILITY XXX Company Oil Well Water Haul

1. The name(s) and complete mailing address(es) of the applicant(s) is/are XXX Company
P. O. Box 001
Cheyenne, Wyoming 82001

(If more than one applicant, designate one to act as Agent for the others.)
2. Name & address of agent to receive correspondence and notices John Doe, P. O. Box 000,
Cheyenne, Wyoming 82001

3. (a) The use to which the water is to be applied is Industrial (Oil or Gas Well Drilling)

(b) If more than one beneficial use of water is applied for, the location and ownership of the point of use must be shown in item 10 of the application and the details of the facilities used to divert and convey the appropriation must be shown on the map in sufficient detail to allow the State Engineer to establish the amount of appropriation. In multiple use applications, stock and domestic purposes are limited to 0.056 cubic feet per second.

4. The source of the proposed appropriation is Jim Draw, tributary of Oil Creek, tributary
of Blank Creek, which is a tributary of Blank Blank River

5. The point of diversion of the proposed works is located S82°00'W 2200 feet distant from the NE corner of section 12 T. 40 N. R. 70 W., and is in the NW 1/4 of Section 12 T. 40 N. R. 70 W.

6. Are any of the lands crossed by the proposed facility owned by the State or Federal Government? If so, describe lands and indicate whether State or Federally owned.
The NW 1/4 Section 12, T 40 N, R 70 W is State land.
The SW 1/4 Section 12, T 40 N, R 70 W is Federal land.

7. The carrying capacity of the ditch, canal, pipeline or other facility at the point of diversion is (50 gpm) 0.11 cubic feet per second.

8. The accompanying map is prepared in accordance with the State Engineer's Manual of Regulations and Instructions for filing applications and is hereby declared a part of this application. The State Engineer may require the filing of detailed construction plans.

9. The estimated time required for commencement of work is 1 day for completion of construction is 60 days and to complete the application of water to the beneficial uses stated in this application is 60 days.

Permit No. _____

Page No. _____
(Leave Blank)

POOR ORIGINAL

849 224

84 58

10. The land to be irrigated under this permit is described in the following tabulation. (Give irrigable acreage in each 40-acre subdivision. Designate ownership of land, federal, State or private. If private, list names of owners and land owned separately.) If application is for stock, domestic, or for purposes other than irrigation indicate point of use for 40-acre subdivision and owner.

Township	Range	Sec.	NE1/4				NW1/4				SW1/4				SE1/4				TOTALS
			NE1/4	NW1/4	SW1/4	SE1/4	NE1/4	NW1/4	SW1/4	SE1/4	NE1/4	NW1/4	SW1/4	SE1/4	NE1/4	NW1/4	SW1/4	SE1/4	
			The following described land is Federal land, leased by the applicant for exploratory oil and gas well drilling purposes.																
40	76	12	X Point of use XXX Oil Company Oil Well No. XX																
			The following described land is privately owned land, leased by the applicant for exploratory oil and gas well drilling purposes																
40	70	11	X Point of use XXX Oil Company Oil well No. XX																

Symptoms of areas to receive original supply _____

Number of acres to receive supplemental supply.....

Total Number of acres to be irrigated _____

REMARKS

Water will be taken from the point of diversion (Jim Draw) in the NW $\frac{1}{4}$ NE $\frac{1}{4}$, Section 12, Township 40 North, Range 70 West at a rate of (50 gpm) 0.11 cfs or about 30,000 gpd for a total amount of approximately 450,000 gallons, then truck hauled to the drilling site located in the SW $\frac{1}{4}$ SW $\frac{1}{4}$, Section 12, Township 40 North, Range 70 West for oil and gas well drilling purposes, within a 60-day period.

Under penalties of perjury, I declare that I have examined this application and to the best of my knowledge and belief it is true correct and complete.

John Lee
Signature

Signature of Applicant or Agent

January XX, 1974

Date: _____

POOR ORIGINAL

849 225

849259

POOR ORIGINAL

849260

849 226

NOTE: THIS INFORMATION MAY BE SHOWN ON A SEPARATE MAP OR A WYOMING COUNTY MAP. THE CERTIFICATE OF SURVEYOR AND THE TIE TO THE POINT OF DIVISION ARE REQUIRED, BUT NOT NECESSARY.

WATER WILL BE DIVIDED (FROM NAME OF STREAM) AT A RATE OF 15.2 M. GALLONS (NOT TO EXCEED) NUMBER OF GAL. PER DAY FOR A TOTAL OF 120 M. GALLONS. AMOUNT NEEDED TO DRILL WELL GALLONS THE TOTAL AMOUNT OF WATER WILL BE USED OVER A PERIOD OF (DATE) THE TIME REQUIRED TO DRILL THE OIL WELL.

MAP FOR
TO ACCOMPANY APPLICATION
FOR
OIL WELL WATER HAUL
APPLICANT INC.
OIL COMPANY INC.
P.O. BOX 601
CHEYENNE, WYO.
87001

STATE OF WYOMING
COUNTY OF _____
CERTIFY THAT THIS MAP WAS MADE FROM A SURVEY TAKEN DURING AN ACTUAL SURVEY OF THE LANDS OF THE STATE OF WYOMING. THE SURVEY WAS MADE UNDER MY PERSONAL SUPERVISION AND THAT IT CORRECTLY REPRESENTS THE POSITION OF THE POINT OF DIVISION AND THE LOCATION OF THE HAUL ROUTE. IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND AND SEAL OF OFFICE AT CHEYENNE, WYOMING, THIS _____ DAY OF _____, 19____.

STATE ENGINEERS ENDORSEMENT
BLOCK

WYOMING PE 15

PART I.

STATE OF WYOMING
OFFICE OF THE STATE ENGINEER

REQUEST FOR STORAGE OF
A DIRECT FLOW
RIGHT

As a holder or owner of a valid right to the direct use of the natural, unstored flow of a surface stream in the State of Wyoming, and in accordance with Section 41-29.1, Wyoming Statutes, 1957, pps 1973, and the Rules and Regulations of the State Engineer and Board of Control, the applicant hereby requests permission to store such direct flow at such times as it can be accomplished without injuring or affecting any other Wyoming appropriator.

(Note: This request form is prepared for the purpose of storage of water under a direct flow irrigation right only. In the event storage is proposed under a direct flow right issued for some purpose other than irrigation, it is suggested that as much information as possible be furnished on this form concerning the proposal together with whatever supplemental information is deemed necessary. The State Engineer will then determine if such proposal appears feasible.)

The details pertaining to this proposal are outlined as follows:

1. Name(s) of Water Right Holder

Address

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PART I.

2. Identification of Right to be Stored

Permit Number _____; Name of Ditch _____;
Name of Original Appropriator _____;
Priority _____; Use _____;
Amount of Appropriation _____ c.f.s. for _____ Acres;
Source _____;
Location of Point of Diversion: Subdivision $\frac{1}{4}$ $\frac{1}{4}$ Section _____,
Township _____, Range _____; Portion of Right Held by
Applicant _____; Water Division No. _____; Water District No.
_____; Lands owned by applicant irrigated with said direct flow right

3. History of Use of Appropriation

- a. Is right proposed to be stored an active right in use at the present time? Yes _____ No _____.
- b. During the immediate, past five-year period, when has the right been used for irrigation purposes? (In reply to this question, please indicate the days of the month that water was used each year and the amount of water diverted each of these days.)

19____. _____

19____. _____

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PART I.

19____.

19____.

19____.

4. Name and Location of Reservoir

It is proposed to store water under this request in the _____
_____ Reservoir, located in Section _____, Town-
ship _____, Range _____. This is an existing/a new reser-
(strike out words not applicable)
covered under Permit No. _____ Res.

5. Owner of Storage Reservoir

The above named reservoir is owned by _____

(name)

(address)

(Note: If reservoir is owned by someone other than the owner of the direct flow appropriation involved herein, a written agreement with the reservoir owner must be filed with this request, and said agreement should specify the conditions under which the reservoir owner agrees to the storage of the direct flow right in said reservoir.)

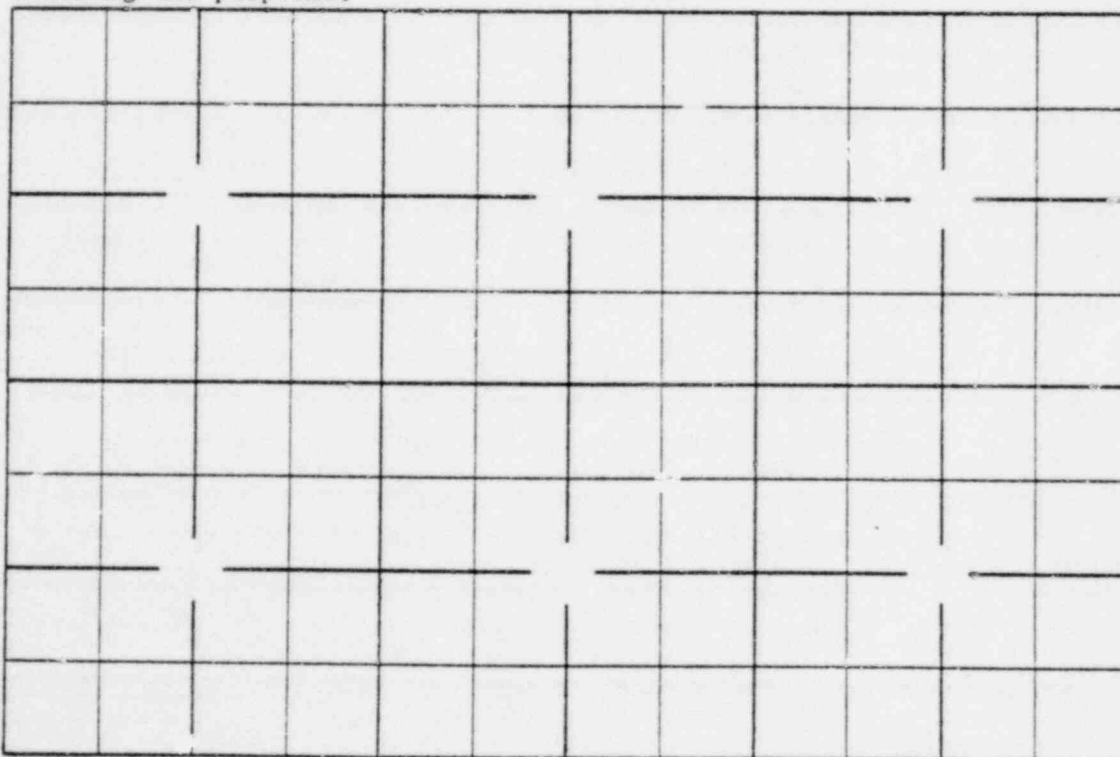
6. Generally describe how storage of direct flow right will be accomplished and when it is proposed to make such storage. _____

PART I.

7. Describe lands where stored water will be used:

(Note: The use of water stored is restricted to the same lands covered under the direct flow right.)

8. In the space below, draw a sketch map showing the location of the stream, the direct flow right involved, the location of the reservoir where water is to be stored, the location of the lands on which stored water is to be used and any other information which would help in understanding the proposal.



Scale: 2" = 1 Mile

849 230

PART I.

Remarks: _____

(I) (We) hereby assert that no one will be injured by such storage of direct flow water and such storage will be at (my) (our) own risk. It is further agreed that the exercise of this right to store is subject at all times to the control of the water administrative officials, and the appropriate Water Commissioner and Water Division Superintendent will be notified in writing each time it is proposed to store water under this request. It is further understood that written approval of the Water Commissioner will be required each time water is to be stored.

A fee of Ten Dollars (\$10) is enclosed with this request.

(Note: If less than this amount is needed, the balance will be refunded).

The information contained in this request is true to the best of (my) (our) knowledge and belief.

(Signature of Applicant)

(Signature of Applicant)

(Signature of Applicant)

(Signature of Applicant)

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PART I.

This instrument is acknowledged before me this _____ day of
_____, 19____.

Witness my hand and official seal.

(Notary Public)

My Commission expires: _____

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GROUND WATER

INSTRUCTIONS FOR COMPLETING FORM U. W. 5 Application for Permit to Appropriate Ground Water

Address all communications concerning ground water to the Ground Water Section, State Engineer's Office, Barrett Building, Cheyenne, Wyoming, 82002. Application forms may be obtained from the State Engineer's Office in Cheyenne or from the County Clerk's Office in each County Courthouse.

The application must not be folded. Applications submitted on photocopied forms will not be accepted.

The application must not be defaced by crossing out or erasing printed matter, or by pasting over printed matter. The application should be typed or lettered neatly with black ink. If the printed form does not fulfill the requirements of the application, do not cross out printed matter, but make an explanatory note in the space provided for REMARKS.

FEES -- A \$2.00 filing fee is required for each application. An application will not be accepted for filing unless it is accompanied by the legally required filing fee. Make checks payable to "Wyoming State Engineer".

Name of Well -- A short, distinctive name and number must be assigned to the well. For example: Smith #1

The application should be completed as follows:

Item 1. Name of applicant(s) -- Include all parties having an interest in the application. All parties designated as landowners under Items 12 and 13 must be shown as co-applicants, or an easement or right-of-way agreement submitted.

Item 2. Address -- Give the respective mailing address of each applicant.

Item 3. Name and address of agent -- If the applicant is a company or organization, or if several parties are named as co-applicants, one person should be designated as agent to receive correspondence.

Item 4. The use to which the water will be applied -- Mark the use or uses to which the water will be applied. Please note -- Domestic use includes single-family household use and the irrigation of one (1) acre or less of lawn and garden for noncommercial family use. A preferred right is given to domestic and/or stock wells where yields do not exceed 25 gallons per minute. If the water is for industrial or miscellaneous use, the details of use must be described completely and accurately. Miscellaneous use covers such uses as subdivisions, mobile home parks, service stations, campgrounds, etc.

SEE REVERSE SIDE

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Item 5. Location of the well -- Designate the 40-acre legal subdivision or lot in which the well will be located and the Section, Township and Range. If located in a resurvey lot or tract, please so indicate. If the well is to be located in a city, town or platted subdivision, give the name of the city or town, subdivision, lot and block numbers. For example: Lot 9, Block 6, North Hills Subdivision of Cheyenne.

Item 6. Grid -- The well location should be designated on the section grid shown on the application form.

Item 7. Item 7 is self-explanatory.

Item 8. Maximum quantity of water to be developed and beneficially used -- The estimated quantity of water should be the MAXIMUM amount of water that would be used. The actual amount, determined after the well has been drilled and tested, must be equal to or less than the amount listed in Item 7. Actual amount will be reported on the Statement of Completion and Description of the Well. (This second form will be sent to the applicant or agent with a copy of the approved permit.) Springs: Only springs flowing 25 gallons per minute or less, where the proposed use is domestic or stockwatering, will be considered as ground water appropriations. Note: After the approval of the application, some type of artificial diversion must be constructed to qualify for a water right. The proposed method of development of the spring and means of conveying the water to the point(s) of use must be described on the application under REMARKS.

Item 9. Check appropriate box.

Item 10a. Tabulation (Irrigation) -- If the proposed use is irrigation, show the MAXIMUM acreage to be irrigated. Describe the number of acres to be irrigated in each 40-acre subdivision. If the lands are owned by more than one party, indicate which lands are owned by the State or Federal government, indicate which lands are owned by the applicant(s) and which are administered by government agencies.

Item 10b. Tabulation -- If the proposed use is for any purpose other than irrigation, show the area(s) and/or point(s) of use by placing a check mark in the proper subdivision box.

Item 11. Describe the type of irrigation system proposed.

Items 12 and 13. Items 12 and 13 are self-explanatory. Any unusual situation, such as desert land entries, state grazing leases, etc., should be explained under REMARKS.

Remarks -- This space is provided for any statement of unusual circumstances peculiar to the application, or if a more complete explanation is needed for certain items. Details of miscellaneous or industrial uses should be explained in this section. Water rights to which the well is supplemental, if any, should be listed here. Details of proposed spring development must be explained here.

THE APPLICATION MUST BE SIGNED IN INK.

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INSTRUCTIONS FOR COMPLETING
STATEMENT OF COMPLETION AND DESCRIPTION OF WELL, FORM U.W. 6
AND
PROOF OF APPROPRIATION AND BENEFICIAL USE OF GROUND WATER, FORM U.W. 8

General Instructions

- I. Address all communications to the State Engineer, Barrett Building, Cheyenne, WY 82002.
- II. These forms must be signed by the well owner.
- III. Only the original forms, sent out by this office, are acceptable. NO COPIES OF ANY TYPE WILL BE ACCEPTED.
- IV. When a Statement of Completion is returned to the permittee for correction, it should be understood that the corrections are required for the protection of the applicant and in the interest of maintaining accurate records. Please make the corrections and return to this office as promptly as possible.
- V. The Statement of Completion is required by law to be submitted within thirty (30) days of the date that a well is completed and ready for use.
- VI. Proof of Appropriation and Beneficial Use of Ground Water (Form U.W. 8) is required to be submitted within a period of one year of December 31 of the year in which the permit is granted. This form is required for all wells except Domestic and Stockwatering.

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL
Form U.W. 6

Statements of Completion must not be folded.

Statements must not be defaced by crossing out or erasing printed matter, or by changing the form in any way. Preferably, the form should be typed. If a typewriter is not available, the form should be lettered neatly with black ink or ball point pen.

PLEASE NOTE: If any of the information required in the Statement of Completion is not available or is unknown, write "not available" or "unknown" in the space provided for that particular item.

The Statement of Completion must be signed by the permittee.

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The Statement of Completion should be made out as follows:

1. The name of owner - This should be the name of the original applicant (permittee) or present owner of the well.
 2. Address - Give the respective mailing address of each permittee or present owner.
 3. Use of the water - If use of water is not the same as shown on the approved permit, an explanatory note should be included.
 4. Location of well - A specific location must be submitted. If a surveyor's tie is not available, a distance measurement from a known section or quarter corner must be provided.
- Items 5 through 7 are self-explanatory.
8. Date of completion of well - This item should reflect the date the pumping facility was installed.
 9. Pump information - This item should be completed as accurately and thoroughly as possible. The number of gallons per minute being pumped must be shown.

Items 10 through 12 - Information relating to these items should be available from the driller and should be as complete as possible.

13. Tabulation - The instructions for this item are printed on the form.
14. Plat - Instructions for this item are clearly defined on the form.
15. This item should be completed only if the well will be abandoned.

The form must be signed by the permittee or present well owner.

PROOF OF APPROPRIATION AND BENEFICIAL USE OF GROUND WATER
Form U.W. 8

(For all wells except Domestic and Stockwatering)

The information submitted on this form will be used as a basis for the adjudication of the underground water right. The items are self-explanatory and each item should be completed as accurately and thoroughly as possible.

PART II, THE PREPARATION OF THE PLAT, SHOULD BE READ CAREFULLY BEFORE THE FORM IS COMPLETED.

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Appendix D

State of Montana
Major Facilities Permit Procedures
Water Right Procedures

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Montana Major Facility Certificate Process

The 1973 Montana Legislature enacted the Utility Siting Act which was amended and renamed the Major Facility Siting Act in 1975. Pursuant to this Act, a person must obtain a certificate of environmental compatibility and public need prior to the construction or operation of a facility as defined in the Act. Facilities included are:

- 1) Electrical generating plants (including hydro-electrical) of a capacity of 50 MW or more.
- 2) Gasification plants capable of producing 25 million cubic feet of gas a day.
- 3) Liquifaction plants capable of producing 25 thousand barrels of liquid hydrocarbon products per day (except oil and gas refineries).
- 4) Plants capable of using, refining, or converting 500,000 tons of coal per year.
- 5) Uranium enrichment plants.
- 6) Additions to any of the above, costing at least \$250,000.
- 7) Electrical transmission lines above 69 KV
- 8) Facilities associated to the above, such as pipelines, pumps, water intake or treatment plants.

To obtain a certificate to build one of these facilities, the applicant must file an application with the Department of Natural Resources and Conservation. The contents and form of the application are specified by rules adopted in accordance with this Act. The application must include, among other things, a description of the proposed facility and its preferred location, a statement explaining its need, a summary of any impact studies which may have been made, and a discussion of reasonable alternative sites. The application must be accompanied by payment of the filing fee, the amount of which is based on the estimated cost of the facility and a sliding fee schedule. The fee begins at two percent of the first \$1,000,000 and decreases to one eighth of one percent for estimated cost over \$300,000,000. A facility estimated to cost \$10,000,000, for example, would require a filing fee of \$110,000.

After receiving an application, the Department has two years (except for certain transmission lines that allow one year) to conduct studies to determine the need and the kinds and degrees of environmental impacts the facility would create, write an environmental impact statement, and make recommendations to the Board of Natural Resources. The Board then holds a public hearing and rules on the application. As decision makers, the Board can grant, deny, or grant with modifications the original application.

The Major Facilities Siting Act also requires any person contemplating construction of a facility in Montana in the ensuing ten years to file a long range plan with the Department each year on the first of April. The long range plan must include, among other things, the general location, size, and type of facility contemplated.

Although the Act limits the amount of time the Department can spend in conducting its studies, there is no time limit on the Board. From the time this Department makes its recommendations until the Board can hold a hearing and render a decision many months may elapse. In one case, the process took nearly one and a half years.

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This brief overview of the Major Facility Siting Act does not address all the points of the Act. Before serious consideration is given to building in Montana, the potential applicant should contact the Department and obtain a copy of the Act and the latest rules relating to it. Discussions with Department personnel will be helpful in expediting the necessary procedures.

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MONTANA WATER PERMIT PROCESS

Under Montana law, new water rights are obtained via the workings of a permit system, which became effective July 1, 1973. There are no preferential uses of water in the permit system, thus water right applications for all beneficial uses (e.g. agricultural, municipal, industrial, etc.) are administered equally. However, there are some exceptions to this rule resulting from a moratorium placed on larger applications for permits in the Yellowstone Basin.

The process of obtaining a water use permit involves some fundamental steps: an application and accompanying filing fee, which is determined on the basis of the annual volume of water requested in the application, must be submitted to the Department on the appropriate form; water users in the proposed area of development and other interested parties are notified individually and publicly of the applicant's intent; objections are received and evaluated following the notification step, and, if objectors and the applicant cannot reach an informal agreement, an administrative hearing is conducted to deny, modify, or issue a water use permit.

If an application involves the use of ten thousand (10,000) or more acre-feet per year or fifteen (15) or more cubic feet per second of water, or if significant environmental impacts could result from the proposed development, special considerations must be made by the Department pursuant to Montana's water law and state environmental protection guidelines. Also an applicant applying for fifteen cubic feet per second or more must prove by clear and convincing evidence that the water rights of prior appropriators will not be adversely affected.

Processing time, from date of application to date of the issuance of a permit, averages less than four months for applications for which hearings are not conducted; the need for a hearing prolongs processing time, sometimes for months. The entire process, whether or not it includes the hearing procedures, can be accelerated by the applicant's cooperation in supplying the department with all available information on the proposed water development at the time of application and as it subsequently becomes available.

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Appendix E

State of Washington
Site Evaluation Council Procedures

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February 2, 1977

State of
Washington
Department
of Ecology



REC'D 5 1977

Mr. James Fish
ICWP Project Director
F. Robert Edman & Associates, Inc.
W-3173 First National Bank Building
St. Paul, Minnesota 55101

Dear Jim:

In accordance with our telephone conversation, we are enclosing copies of our state Siting Council statutes, a brief description of the procedural steps, and the new guidelines for applicants which were adopted only last week (that is why they appear in rough draft form).

To provide additional detail of the full process, we are attaching also, copies of the further rules and regulations for documentation as to the scope and depth of the Council's evaluation.

Since the original Council was formed in 1970, we have certified seven units at four sites, completed one preliminary site study, and are presently processing an application from the Northern Tier Pipeline Company for an oil port and tank farm on the Straits of Juan de Fuca and a 42-inch pipeline across the state (which is intended to terminate at Clearbrook, Minnesota).

If we can provide additional information, please feel free to write or call.

Sincerely.

A handwritten signature in cursive script, appearing to read "Fred".

Fred D. Hahn
Assistant Director
Office of External Affairs

FDH:dt

Enclosures

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PROVISIONS OF THE LAW

The policy of the State of Washington with respect to siting energy facilities is twofold: to recognize the need for more facilities and to ensure that the location and operation of these facilities produces minimal adverse effects on their surroundings.¹ The actions of the Site Evaluation Council are to be based on satisfactory assurances of safety, environmental protection and abundant, reasonably priced energy.²

The jurisdiction of the Council extends over energy facilities which are new, which are reconstructed or which are being enlarged. Normal maintenance and repairs are exempted, as are existing facilities and those undergoing certification at the time of the law's passage.³ The term "energy facility" is defined⁴ to include the following three categories, which are further defined:

Energy plant⁵

Thermal power plants of more than 250,000 kilowatts capacity

Floating thermal power plants of more than 50,000 kilowatts capacity

Liquefied natural gas ports which will receive more than 100 million cubic feet per day

Oil ports which will receive more than 50,000 barrels per day

Underground natural gas storage reservoirs of more than 100 million cubic feet per day capacity

Oil refineries which will process more than 25,000 barrels per day

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Transmission facility⁶

Oil pipelines larger than six inches in diameter and
fifteen miles in length

Natural gas pipelines except interstate pipelines

Energy transmission corridor⁷

Land jointly used for more than one transmission facility

The Council's membership includes⁸ the directors of fourteen state agencies (or their designees), a representative of the county in which the facility is proposed, and a port district representative if the application is for an oil or liquified natural gas port. The chairman, a nonvoting member, is the director of the State Energy Office (or his designee).

After an application is received, EFSEC is to process it and make a recommendation to the Governor as to final approval or disapproval within twelve months or a mutually agreed upon later time.⁹ The Governor must approve or reject the application within sixty days. If the application is approved, a certification agreement is prepared by the chairman of the Council for execution by the Governor and the applicant.

Once signed, the certification agreement binds all of state government to the conditions therein, and is in lieu of any other state permit or license.¹⁰ In addition, the state preempts the regulation of energy facilities.¹¹

When an application is made, it must be accompanied by a \$25,000 fee which is used by EFSEC to hire an independent consultant. The consultant is to prepare an environmental assessment of the proposal, under Council direction. If cost exceeds the initial fee, a higher amount can be negotiated between the Council and the applicant.¹²

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Within sixty days of receiving an application, EFSEC must hold a public hearing in the county of the proposed site. At this hearing, a determination must be made whether the proposal is consistent with local land use plans and in compliance with local zoning ordinances.¹³ Once a positive determination is made, the plans and ordinances may not be changed. An Attorney General's Opinion of 1977¹⁴ states that a certification signed by the Governor does allow construction even where local zoning codes would not otherwise allow construction. At least one more public hearing, conducted as a contested case under the Administrative Procedures Act, must be held before a recommendation is made to the Governor.

During the processing of the application intervenors may be granted status as parties to the case. Additionally, the Attorney General appoints a Counsel for the Environment, who is to represent the public and its interest in environmental quality.¹⁵

In keeping with the "one stop" concept, the Council also grants a permit which federal law¹⁶ requires. During the contested case hearing, a proposed National Pollutant Discharge Elimination System Permit is submitted and finalized. This Permit becomes effective only upon final certification by the Governor.¹⁷

A prospective applicant also has available to him a mechanism by which the Council will perform a preliminary study which is not binding and does not substitute for any part of the certification procedure.¹⁸ Upon request of a potential applicant, and upon payment of a \$10,000 fee, EFSEC will commission an independent consultant to prepare information regarding environmental impact on the potential site. As with the full certification fee, the \$10,000 can be increased if the potential applicant agrees. This report may be used as an Environmental Impact Statement by any governmental entity except the Site Evaluation Council when taking action on the preliminary study. An Environmental Impact Statement must be prepared by the Council under full certification procedures.

- 1 PCW 80.50.010
- 2 Id.
- 3 RCW 80.50.060
- 4 RCW 80.50.020(1)
- 5 Id. (17)
- 6 Id. (7)
- 7 Id. (8)
- 8 RCW 80.50.030. Subsection 3 lists the
 - Department of Ecology
 - Department of Fisheries
 - Department of Game
 - Department of Parks and Recreation
 - Department of Social and Health Services
 - Interagency Committee for Outdoor Recreation
 - Department of Commerce and Economic Development
 - Utilities and Transportation Commission
 - Office of Program Planning and Fiscal Management
 - Department of Natural Resources
 - Planning and Community Affairs Agency
 - Department of Emergency Services
 - Department of Agriculture
 - Department of Highways
- 9 RCW 80.50.100
- 10 RCW 80.50.120
- 11 RCW 80.50.110(2)
- 12 RCW 80.50.070
- 13 RCW 80.50.090
- 14 AGLO 1977 No. 1
- 15 RCW 80.50.080
- 16 Federal Water Pollution Control Act Amendments of 1972, P.L. 92-500. 33 USC 1251 et seq.
- 17 RCW 90.48.262(2)
- 18 RCW 80.50.175

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Chapter 80.50
ENERGY FACILITIES—SITE LOCATIONS ✓

Sections

- 80.50.010 Legislative finding—Policy—Intent.
- 80.50.020 Definitions.
- 80.50.030 Energy facility site evaluation council—Created—
Membership.
- 80.50.040 Energy facility site evaluation council—Powers
enumerated.
- 80.50.050 Adoption of council guidelines as rules.
- 80.50.060 Energy facilities to which chapter applies—Applica-
tions for certification—Forms—Information.
- 80.50.070 Applications for site certification—Fee—Study.
- 80.50.080 Counsel for the environment.
- 80.50.090 Public hearings.
- 80.50.100 Recommendations to governor—Approval or denial of
certification.
- 80.50.110 Chapter governs and supersedes other law or regula-
tions—Preemption of regulation and certification by
state.
- 80.50.120 Effect of certification.
- 80.50.130 Revocation or suspension of certification—Grounds.
- 80.50.140 Review.
- 80.50.150 Enforcement of compliance.
- 80.50.160 Availability of information.
- 80.50.170 Study of potential sites—Intent of RCW 80.50.175.
- 80.50.175 Study of potential sites—Fee—Disposition of
payments.
- 80.50.800 Rules of thermal plant site evaluation council to continue
until amended or rescinded.

[Title 80—p 33]

POOR ORIGINAL

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80.50.900 Severability—1970 ex.s. c 45.
80.50.901 Severability—1974 ex.s. c 110.

Energy supply emergencies: Chapter 43.21G RCW.

State energy office: Chapter 43.21F RCW.

Water pollution: control, thermal power plants, permits, etc., duties of thermal power plant site evaluation council: RCW 90.48.262.

80.50.010 Legislative finding—Policy—Intent.

The legislature finds that the present and predicted growth in energy demands in the state of Washington requires the development of a procedure for the selection and utilization of sites for energy facilities and the identification of a state position with respect to each proposed site. The legislature recognizes that the selection of sites will have a significant impact upon the welfare of the population, the location and growth of industry and the use of the natural resources of the state.

It is the policy of the state of Washington to recognize the pressing need for increased energy facilities, and to ensure through available and reasonable methods, that the location and operation of such facilities will produce minimal adverse effects on the environment, ecology of the land and its wildlife, and the ecology of state waters and their aquatic life.

It is the intent to seek courses of action that will balance the increasing demands for energy facility location and operation in conjunction with the broad interests of the public. Such action will be based on these premises:

(1) To assure Washington state citizens that, where applicable, operational safeguards are at least as stringent as the criteria established by the federal government and are technically sufficient for their welfare and protection.

(2) To preserve and protect the quality of the environment; to enhance the public's opportunity to enjoy the esthetic and recreational benefits of the air, water and land resources; to promote air cleanliness; and to pursue beneficial changes in the environment.

(3) To provide abundant energy at reasonable cost. [1975-76 2nd ex.s. c 108 § 29; 1970 ex.s. c 45 § 1.]

Severability—Effective date——1975-76 2nd ex.s. c 108: See notes following RCW 43.21F.010.

Nuclear energy development: RCW 43.31.280-43.31.320.

Nuclear power facilities, joint operation: Chapter 54.44 RCW.

State energy office: Chapter 43.21F RCW.

Western interstate nuclear compact: RCW 43.31.400-43.31.420.

80.50.020 Definitions. (1) "Applicant" means any person who makes application for a site location certification pursuant to the provisions of this chapter;

(2) "Application" means any request for approval of a particular site or sites filed in accordance with the procedures established pursuant to this chapter;

(3) "Person" means an individual, partnership, joint venture, private or public corporation, association, firm, public service company, political subdivision, municipal corporation, government agency, public utility district, or any other entity, public or private, however organized;

(4) "Site" means any proposed location, for an energy facility;

(5) "Certification" means a binding agreement between an applicant and the state which shall embody compliance to the siting guidelines, in effect as of the

date of certification, which have been adopted pursuant to RCW 80.50.050 as now or hereafter amended as conditions to be met prior to or concurrent with the construction or operation of any energy facility;

(6) "Associated facilities" means new storage, transmission, handling, or other related and supporting facilities connecting an energy plant with the existing energy supply, processing, or distribution system, including, but not limited to, communications, controls, mobilizing or maintenance equipment, instrumentation, and other types of ancillary transmission equipment, off-line storage or venting required for efficient operation or safety of the transmission system and overhead, and surface or subsurface lines of physical access for the inspection, maintenance, and safe operations of the transmission facility and new transmission lines constructed to operate at nominal voltages in excess of 200,000 volts to connect a thermal power plant to the northwest power grid: *Provided*, That common carrier railroads or motor vehicles shall not be included;

(7) "Transmission facility" means any of the following together with their associated facilities:

(a) Crude or refined petroleum or liquid petroleum product transmission pipeline: A pipeline larger than six inches minimum inside diameter between valves for the transmission of these products with a total length of at least fifteen miles;

(b) Natural gas, synthetic fuel gas, or liquefied petroleum gas transmission pipeline: A pipeline for the purpose of delivering gas to a distribution facility or more specifically, a "gas transmission line" as defined by the office of pipeline safety, United States department of transportation, except an interstate natural gas pipeline regulated by the United States federal power commission;

(8) "Energy transmission corridor" means land jointly used for more than one new transmission facility;

(9) "Independent consultants" means those persons who have no financial interest in the applicant's proposals and who are retained by the council to evaluate the applicant's proposals, supporting studies, or to conduct additional studies;

(10) "Thermal power plant" means, for the purpose of certification, any electrical generating facility using any fuel, including nuclear materials, for distribution of electricity by electric utilities;

(11) "Energy facility" means an energy plant, transmission facilities, or an energy transmission corridor: *Provided*, That the following are excluded from the provisions of this chapter:

(a) Facilities for the extraction, conversion, transmission or storage of water, other than water specifically consumed or discharged by energy production or conversion for energy purposes; and

(b) Facilities operated by and for the armed services for military purposes or by other federal authority for the national defense;

(12) "Council" means the energy facility site evaluation council created by RCW 80.50.030;

(13) "Counsel for environment" means an assistant attorney general or a special assistant attorney general

who shall represent the public in accordance with RCW 80.20.080;

(14) "Construction" means on-site work and construction shall not be deemed to have commenced until there has been an expenditure of not less than two hundred fifty thousand dollars in on-site improvements, excluding exploratory work;

(15) "Chairman" means the chairman of the council;

(16) "Member agency" means departments, agencies and commissions enumerated in RCW 80.50.030(3) as now or hereafter amended;

(17) "Energy plant" means the following facilities together with their associated facilities:

(a) Any stationary thermal power plant with generating capacity of two hundred fifty thousand kilowatts or more and floating thermal power plants of fifty thousand kilowatts or more, including associated facilities;

(b) Facilities which will result in receipt of liquified natural gas in the equivalent of more than one hundred million standard cubic feet of natural gas per day, which has been transported over marine waters;

(c) Facilities which will result in the receipt of more than an average of fifty thousand barrels per day of crude or refined petroleum which has been or will be transported over marine waters, except that the provisions of this chapter shall not apply to storage facilities unless occasioned by such new facility construction;

(d) Any underground reservoir for receipt and storage of natural gas as defined in RCW 80.40.010 capable of delivering an average of more than one hundred million standard cubic feet of natural gas per day; and

(e) Facilities which will result in the processing of more than twenty-five thousand barrels per day of petroleum into refined products. [1975-'76 2nd ex.s. c 108 § 30; 1970 ex.s. c 45 § 2.]

Severability—Effective date—1975-'76 2nd ex.s. c 108: See notes following RCW 43.21F.010.

80.50.030 Energy facility site evaluation council—Created—Membership. (1) There is hereby created and established the "energy facility site evaluation council".

(2) The nonvoting chairman of the council shall be the director of the state energy office: *Provided*, That the director may designate a deputy director or assistant director to serve as chairman.

(3) The council shall consist of the directors, administrators, or their designees, of the following departments, agencies, commissions and committees or their statutory successors:

- (a) Department of ecology
- (b) Department of fisheries
- (c) Department of game
- (d) Department of parks and recreation
- (e) Department of social and health services
- (f) Interagency committee for outdoor recreation
- (g) Department of commerce and economic development
- (h) Utilities and transportation commission
- (i) Office of program planning and fiscal management
- (j) Department of natural resources
- (k) Planning and community affairs agency

(l) Department of emergency services

(m) Department of agriculture

(n) Department of highways.

(4) The county legislative authority of every county wherein an application for a proposed site is filed shall appoint a member or designee to the council. The member or designee so appointed shall sit with the council only at such times as the council considers the proposed site for the county which he represents and such member or designee shall serve until there has been a final acceptance or rejection of such proposed site;

(5) For any port district wherein an application for a proposed port facility is filed subject to this chapter, the port district shall appoint a member or designee as a nonvoting member to the council. The member or designee so appointed shall sit with the council only at such times as the council considers the proposed site for the port district which he represents and such member or designee shall serve until there has been a final acceptance or rejection of such proposed site. The provisions of this subsection shall not apply if the port district is the applicant, either singly or in partnership or association with any other person. [1975-'76 2nd ex.s. c 108 § 31; 1974 ex.s. c 171 § 46; 1970 ex.s. c 45 § 3.]

Severability—Effective date—1975-'76 2nd ex.s. c 108: See notes following RCW 43.21F.010.

80.50.040 Energy facility site evaluation council—Powers enumerated. The council shall have the following powers:

(1) To adopt, promulgate, amend, or rescind suitable rules and regulations to carry out the provisions of this chapter, and the policies and practices of the council in connection therewith;

(2) To appoint an executive secretary to serve at the pleasure of the council;

(3) To appoint and prescribe the duties of such clerks, employees and agents as may be necessary to carry out the provisions of this chapter: *Provided*, That such persons shall be employed pursuant to the provisions of chapter 41.06 RCW;

(4) To develop and apply topical environmental and ecological guidelines in relation to the type, design, and location of energy facilities subject to this chapter;

(5) To establish rules of practice for the conduct of public hearings pursuant to the provisions of the Administrative Procedure Act, as found in chapter 34.04 RCW;

(6) To prescribe the form, content, and necessary supporting documentation for site certification;

(7) To receive applications for site locations and to investigate the sufficiency thereof;

(8) To make and contract, when applicable, for independent studies of sites proposed by the applicant;

(9) To conduct hearings on the proposed location of the sites;

(10) To prepare written reports to the governor which shall include: (a) a statement indicating whether the application is in compliance with the council's topical guidelines, (b) criteria specific to the site and transmission line routing, and (c) a council recommendation as to the disposition of the application;

(11) To prescribe the means for monitoring of the effects arising from the construction and the operation of energy facilities to assure continued compliance with terms of certification;

(12) To integrate its site evaluation activity with activities of federal agencies having jurisdiction in such matters to avoid unnecessary duplication; and

(13) To present state concerns and interests to other states, regional organizations, and the federal government on the location, construction, and operation of any energy facility which may affect the environment, health, or safety of the citizens of the state of Washington. [1975-'76 2nd ex.s. c 108 § 32; 1970 ex.s. c 45 § 4.]

Severability—Effective date—1975-'76 2nd ex.s. c 108: See notes following RCW 43.21F.010.

80.50.050 Adoption of council guidelines as rules. Promptly after it is organized under this chapter, the council shall give notice, pursuant to the Administrative Procedure Act, chapter 34.04 RCW, of intention to adopt as rules the comprehensive guidelines recommended by the council. The council shall adopt the proposed guidelines as rules after making any changes or additions that are appropriate in view of facts and testimony presented at the hearing, provided that the guidelines so changed are consistent with the purposes of this chapter. [1975-'76 2nd ex.s. c 108 § 33; 1970 ex.s. c 45 § 5.]

Severability—Effective date—1975-'76 2nd ex.s. c 108: See notes following RCW 43.21F.010.

80.50.060 Energy facilities to which chapter applies—Applications for certification—Forms—Information. (1) Provisions of this chapter shall apply to those energy facilities to be newly constructed or installed anywhere within the state of Washington, or to reconstruction or enlargement of such existing energy facilities where the new physical capacity being added meets or exceeds those capacities defined in RCW 80.50.020. No construction of such energy facilities or energy transmission corridors may be undertaken, except as otherwise provided in this chapter, after March 15, 1976, without first obtaining certification in the manner provided in this chapter.

(2) Provisions of this chapter shall not apply to normal maintenance and repairs which do not increase the capacity of an energy facility.

(3) Applications for certification of thermal power plants and associated transmission lines made prior to March 15, 1976, shall continue to be governed by the applicable provisions of law in effect on the day immediately preceding March 15, 1976.

(4) Applications for certification shall be upon forms prescribed by the council and shall be supported by such information and technical studies as the council may require. [1975-'76 2nd ex.s. c 108 § 34; 1970 ex.s. c 45 § 6.]

Severability—Effective date—1975-'76 2nd ex.s. c 108: See notes following RCW 43.21F.010.

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80.50.070 Applications for site certification—

Fee—Study. (1) The council shall receive all applications for energy facility site certification. A fee of twenty-five thousand dollars for each proposed site, to be applied toward the cost of any study authorized in subsection (2) of this section, shall accompany the application and shall be a condition precedent to any further consideration or action on the application by the council.

(2) After receiving an application for site certification, the council shall commission its own, independent consultant study to measure the consequences of the proposed energy facility on the environment for each site application. The council shall direct the consultant to study any matter which it deems essential to an adequate appraisal of the site. The full cost of the study shall be paid by the applicant: *Provided*, That said costs exceeding a total of twenty-five thousand dollars shall be payable subject to applicant giving prior approval to such excess amount.

(3) All payments required of the applicant under this section are to be made to the state treasurer, who in turn shall pay the consultant as instructed by the council. All such funds shall be subject to state auditing procedures. Any unexpended portions thereof shall be returned to the applicant. [1975-'76 2nd ex.s. c 108 § 35; 1970 ex.s. c 45 § 7.]

Severability—Effective date—1975-'76 2nd ex.s. c 108: See notes following RCW 43.21F.010.

80.50.080 Counsel for the environment. After the council has received a site application, the attorney general shall appoint an assistant attorney general or a special assistant attorney general as a counsel for the environment who shall be a member of the bar of the state of Washington. The counsel for the environment shall represent the public and its interest in protecting the quality of the environment for the duration of the certification proceedings, until such time as the certification is issued or denied. He shall be accorded all the rights, privileges and responsibilities of an attorney representing a party in a formal action. This section shall not be construed to prevent any person from being heard or represented by counsel in accordance with the other provisions of this chapter. [1970 ex.s. c 45 § 8.]

80.50.090 Public hearings. (1) The council shall conduct a public hearing in the county of the proposed site within sixty days of receipt of an application for site certification: *Provided*, That the place of such public hearing shall be as close as practical to the proposed site.

(2) The council must determine at the initial public hearing whether or not the proposed site is consistent and in compliance with county or regional land use plans or zoning ordinances. If it is determined that the proposed site does conform with existing land use plans or zoning ordinances in effect as of the date of the application, the county or regional planning authority shall not thereafter change such land use plans or zoning ordinances so as to affect the proposed site.

(3) Prior to the issuance of a council recommendation to the governor under RCW 80.50.100 a public hearing,

conducted as a contested case under chapter 34.04 RCW, shall be held. At such public hearing any person shall be entitled to be heard in support of or in opposition to the application for certification.

(4) Additional public hearings shall be held as deemed appropriate by the council in the exercise of its functions under this chapter. [1970 ex.s. c 45 § 9.]

80.50.100 Recommendations to governor—Approval or denial of certification. (1) The council shall report to the governor its recommendations as to the approval or disapproval of an application for certification within twelve months of receipt by the council of such an application, or such later time as is mutually agreed by the council and the applicant.

(2) Within sixty days of receipt of the council's report the governor shall approve or reject the application for certification.

(3) The issuance of denial of the certification by the governor shall be final as to that application but shall not preclude submission of a subsequent application for the same site on the basis of changed conditions or new information.

(4) Upon approval by the governor of the application for certification the chairman of the council shall within thirty days compose and submit a certification agreement for execution by the governor and the applicant. [1975-'76 2nd ex.s. c 108 § 36; 1970 ex.s. c 45 § 10.]

Severability—Effective date—1975-'76 2nd ex.s. c 108: See notes following RCW 43.21F.010.

80.50.110 Chapter governs and supersedes other law or regulations—Preemption of regulation and certification by state. (1) If any provision of this chapter is in conflict with any other provision, limitation, or restriction which is now in effect under any other law of this state, or any rule or regulation promulgated thereunder, this chapter shall govern and control and such other law or rule or regulation promulgated thereunder shall be deemed superseded for the purposes of this chapter.

(2) The state hereby preempts the regulation and certification of the location, construction, and operational conditions of certification of the energy facilities included under RCW 80.50.060 as now or hereafter amended. [1975-'76 2nd ex.s. c 108 § 37; 1970 ex.s. c 45 § 11.]

Severability—Effective date—1975-'76 2nd ex.s. c 108: See notes following RCW 43.21F.010.

80.50.120 Effect of certification. (1) Subject to the conditions set forth therein any certification signed by the governor shall bind the state and each of its departments, agencies, divisions, bureaus, commissions or boards of this state whether a member of the council or not as to the approval of the site and the construction and operation of the proposed energy facility.

(2) The certification shall authorize the person named therein to construct and operate the proposed energy facility subject only to the conditions set forth in such certification.

(3) The issuance of a certification shall be in lieu of any permit, certificate or similar document required by

any department, agency, division, bureau, commission or board of this state whether a member of the council or not. [1975-'76 2nd ex.s. c 108 § 38; 1970 ex.s. c 45 § 12.]

Severability—Effective date—1975-'76 2nd ex.s. c 108: See notes following RCW 43.21F.010.

80.50.130 Revocation or suspension of certification—Grounds. Any certification may be revoked or suspended:

(1) For any material false statement in the application or in the supplemental or additional statements of fact or studies required of the applicant when a true answer would have warranted the council's refusal to recommend certification in the first instance; or

(2) For failure to comply with the terms or conditions of the original certification; or

(3) For violation of the provisions of this chapter, regulations issued thereunder or order of the council. [1970 ex.s. c 45 § 13.]

80.50.140 Review. (1) The approval or rejection of an application for certification by the governor shall be subject to judicial review pursuant to the provisions of chapter 34.04 RCW.

(2) The rules and regulations adopted by the council shall be subject to judicial review pursuant to the provisions of chapter 34.04 RCW. [1970 ex.s. c 45 § 14.]

80.50.150 Enforcement of compliance. (1) The courts are authorized to grant such restraining orders, and such temporary and permanent injunctive relief as is necessary to secure compliance with this chapter and/or with a site certification agreement issued pursuant to this chapter. The court may assess civil penalties in an amount not less than one thousand dollars per day nor more than twenty-five thousand dollars per day for each day of construction or operation in material violation of this chapter, or in material violation of any site certification agreement issued pursuant to this chapter.

(2) Wilful violation of any provision of this chapter shall be a gross misdemeanor.

(3) Civil or criminal proceedings to enforce this chapter may be brought through the attorney general by the prosecuting attorney of any county affected by the violation.

(4) The remedies and penalties in this section, both civil and criminal, shall be cumulative and shall be in addition to any other penalties and remedies available at law, or in equity, to any person. [1970 ex.s. c 45 § 15.]

80.50.160 Availability of information. The council shall make available for public inspection and copying during regular office hours at the expense of any person requesting copies, any information filed or submitted pursuant to this chapter. [1970 ex.s. c 45 § 16.]

80.50.170 Study of potential sites—Intent of RCW 80.50.175. It is the intent of RCW 80.50.175 as now or hereafter amended to expedite the certification of sites for energy facilities subject to this chapter to minimize

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duplication of effort in conducting studies of and preparing environmental impact statements relating to such sites, to authorize and encourage cooperation between the council and counties, other governmental agencies, and municipal or public corporations in connection with such sites, and to provide for a single detailed statement in accordance with RCW 43.21C.030(2)(c) where any proposed energy facilities are subject to certification pursuant to chapter 80.50 RCW, and to further the development of facilities to meet pressing needs: *Provided*, That it is the intent of the legislature that appropriate consideration will be given to protecting and preserving the quality of the environment. [1975-'76 2nd ex.s. c 108 § 39; 1974 ex.s. c 110 § 1.]

Severability—Effective date—1975-'76 2nd ex.s. c 108: See notes following RCW 43.21F.010.

80.50.175 Study of potential sites—Fee—Disposition of payments. (1) In addition to all other powers conferred on the council under this chapter, the council shall have the powers set forth in this section.

(2) The council, upon request of any potential applicant, is authorized, as provided in this section, to conduct a preliminary study of any potential site prior to receipt of an application for site certification. A fee of ten thousand dollars for each potential site, to be applied toward the cost of any study agreed upon pursuant to subsection (3) of this section, shall accompany the request and shall be a condition precedent to any action on the request by the council.

(3) After receiving a request to study a potential site, the council shall commission its own independent consultant to study matters relative to the potential site. The study shall include, but need not be limited to, the preparation and analysis of environmental impact information for the proposed potential site and any other matter the council and the potential applicant deem essential to an adequate appraisal of the potential site. In conducting the study, the council is authorized to cooperate and work jointly with the county or counties in which the potential site is located, any federal, state, or local governmental agency that might be requested to comment upon the potential site, and any municipal or public corporation having an interest in the matter. The full cost of the study shall be paid by the potential applicant: *Provided*, That such costs exceeding a total of ten thousand dollars shall be payable subject to the potential applicant giving prior approval to such excess amount.

(4) Any study prepared by the council pursuant to subsection (3) of this section may be used in place of the "detailed statement" required by RCW 43.21C.030(2)(c) by any branch of government except the council created pursuant to chapter 80.50 RCW. Except for actions of the council under chapter 80.50 RCW, all proposals for legislation and other actions of any branch of government of this state, including state agencies, municipal and public corporations, and counties, to the extent the legislation or other action involved approves, authorizes, permits, or establishes procedures solely for approving, authorizing or permitting, the location, financing or construction of any energy facility

subject to certification under chapter 80.50 RCW, shall be exempt from the "detailed statement" required by RCW 43.21C.030. Nothing in this subsection shall be construed as exempting any action of the council from any provision of chapter 43.21C RCW.

(5) All payments required of the potential applicant under this section are to be made to the state treasurer, who in turn shall pay the consultant as instructed by the council. All such funds shall be subject to state auditing procedures. Any unexpended portions thereof shall be returned to the potential applicant.

(6) Nothing in this section shall change the requirements for an application for site certification or the requirement of payment of a fee as provided in RCW 80.50.070, or change the time for disposition of an application for certification as provided in RCW 80.50.100.

(7) Nothing in this section shall be construed as preventing a city or county from requiring any information it deems appropriate to make a decision approving a particular location. [1975-'76 2nd ex.s. c 108 § 40; 1974 ex.s. c 110 § 2.]

Severability—Effective date—1975-'76 2nd ex.s. c 108: See notes following RCW 43.21F.010.

80.50.800 Rules of thermal plant site evaluation council to continue until amended or rescinded. All rules of the thermal power plant site evaluation council in effect on March 15, 1976 shall continue in full force and effect until amended or rescinded by the energy facility site evaluation council after March 15, 1976. [1975-'76 2nd ex.s. c 108 § 42.]

Severability—Effective date—1975-'76 2nd ex.s. c 108: See notes following RCW 43.21F.010.

80.50.900 Severability—1970 ex.s. c 45. If any provision of this act, or its application to any person or circumstance is held invalid, the remainder of the act, or the application of the provision to other persons or circumstances, is not affected. [1970 ex.s. c 45 § 17.]

80.50.901 Severability—1974 ex.s. c 110. If any provision of this 1974 act, or its application to any person or circumstance is held invalid, the remainder of the act, or the application of the provision to other persons or circumstances, is not affected. [1974 ex.s. c 110 § 3.]

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Appendix F

State of Minnesota
Environmental Quality Council Procedures,
Power Plant Siting

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STATE OF MINNESOTA

Power Plant Siting Rules and Regulations

State Policy

1. No large electric power generating plant or high voltage transmission line shall be constructed except on a site or route designated by the (Environmental Quality) Council.
2. It is the policy of the state to site large electric-power facilities in an orderly manner compatible with environmental preservation and the efficient use of resources.
3. Exclusion Criteria
 - a. No LEPGP* shall be sited in violation of any federal or state law or regulation. No area shall be considered in which a LEPGP is not licensable by all appropriate state and federal government agencies.
 - b. The following land areas shall be excluded: national parks, national historic sites and landmarks; national historic districts; national monuments; national wilderness areas; national wildlife refuges; national, wild, scenic, and recreational riverways; state, wild, scenic, and recreational rivers and their land use districts; state parks; Nature Conservancy preserves; state scientific and natural areas; state wilderness areas; and any area designated a LEPGP exclusion area by the Council.
 - c. No area shall be considered which does not have reasonable access to a proven water supply sufficient for plant operation. No use of ground water shall be permitted where mining of ground water resources will result. "Mining" as used herein shall mean the removal of ground water that results in material adverse effects on ground water in and adjacent to the area, as determined in each case.
 - d. No water shall be transferred between the four major drainage basins within the state: that is, the Missouri River drainage basin, the Mississippi River drainage basin, the Lake Superior drainage basin, and the Red-Rainy River drainage basin.
 - e. Water intake structures and water pipelines shall not necessarily be prohibited from land areas excluded for power plant sites.
4. LEPGP Avoidance Areas
 - a. LEPGP avoidance areas are: state registered historic sites; state historic districts; state wildlife management areas (except in cases where the plant cooling water is to be used for wildlife management purposes); county parks; metropolitan parks; designated state and federal recreational trails; designated trout streams; and the rivers identified in Minn. Stat. §85.32, subd. 1 (1971); and any other area designated a LEPGP avoidance area by the Council.

* Large Electrical Power Generating Plant.

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- b. LEPPG avoidance areas also apply to new transportation access routes and storage facilities associated with the plant in addition to the plant itself. Water intake structures and water pipelines shall not necessarily be prohibited from LEPPG avoidance areas.
 - c. No transfer of water between sub-basins within each of the four major drainage basins shall be permitted except where it can be clearly demonstrated that the transfer will not have an adverse effect on water supplies or water quality in the areas involved.
 - d. The use of ground water for high consumptions purposes, such as cooling, shall be avoided if feasible and prudent surface water alternatives less harmful to the environment exist. Ground water use to supplement available surface water shall be permitted if the cumulative impact minimizes environmental harm.
5. Site Selection Criteria. The following criteria shall be applied in the selection of sites:
- a. Preferred sites require the minimum population displacement and disruption of local communities and institutions.
 - b. Preferred sites minimize adverse health effects on human population.
 - c. Preferred sites do not require the destruction or major alteration of land forms, vegetative types, or wildlife habitat which are rare, unique, or of unusual importance to the surrounding area.
 - d. Preferred sites minimize the visual and audible impingement on waterways, parks, or other existing and proposed public recreation areas.
 - e. Preferred sites minimize the removal of valuable and productive land and water from other necessary uses and minimize conflicts among water users.
 - f. Preferred sites maximize reliability with respect to climate and geology.
 - g. Preferred sites permit significant conservation of energy or utilization of by-products.
 - h. Preferred sites are located near large load centers.
 - i. Preferred sites maximize the use of already existing operating sites and transportation systems.
 - j. Preferred sites allow for larger rather than smaller generating capacity.
6. Exclusion Criteria
- a. No HVTL* shall be routed in violation of any federal or state agency regulations.
 - b. NO HVTL shall be routed through national wilderness areas, state wilderness areas or through any area designated a HVTL exclusion area by the Council.

* High Voltage Transmission Line

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7. Transmission Line Avoidance Areas

HVTL avoidance areas are: national parks; national historic sites and districts and natural landmarks; national monuments; national wildlife refuge areas; national wild, scenic, and recreational riverways; state wild, scenic, and recreational rivers and their land use districts; state parks; state registered historic sites; state historic districts; Nature Conservancy preserves; state scientific and natural areas; county parks; metropolitan parks; designated state and federal recreational trails; designated state canoe and boating routes; and any other area designated a transmission line avoidance area by the Council.

8. Selection Criteria.

The following criteria shall be applied in the selection of corridors:

- a. Preferred corridors and routes minimize disruption to existing urbanized land uses and human settlement.
- b. Preferred corridors and routes minimize disruption to existing and potential irrigated and non-irrigated agricultural land uses.
- c. Preferred corridors and routes minimize disruption to recreational and historical land uses.
- d. Preferred corridors and routes minimize disruption to natural systems including vegetation, wildlife, and water.
- e. Preferred corridors and routes maximize utilization of existing and proposed rights-of-way.
- f. Preferred corridors and routes minimize visual impact on urbanized land, recreational land and water, and transportation corridors.
- g. Preferred corridors and routes optimize cost of materials, labor, right-of way acquisition, project schedules, and maintenance.
- h. Preferred corridors and routes minimize disruption to existing and potential forestry land uses.
- i. Preferred corridors and routes minimize impact upon projected human settlement.
- j. Preferred corridors and routes maximize reliability with respect to climate, soils, geology and vandalism.
- k. Preferred corridors and routes maximize accessibility.
- l. Preferred corridors and routes minimize disruption to existing and potential extractive and storage resources.

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Appendix G

State of Pennsylvania

"Legal Control of Consumptive Water Uses in
Pennsylvania Power Plants," R. Weston and J. Gray
(80 Dickinson Law Review 323, 1976)

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Legal Control of Consumptive Water Use in Pennsylvania Power Plants

R. Timothy Weston*
Joseph R. Gray**

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I. Introduction

Amid the resource shortage crises of the past five years, the least mentioned and perhaps most critical is water. The bountiful precipitation in the eastern United States¹ has allowed relatively unrestricted urban, industrial, commercial, agricultural, and recreational development. The apparent availability of abundant water supplies has caused a continuance of a complacent and largely *laissez-faire* approach to water law and management.² As with other resources, however, indifferent management of water is coming to an end. New water demands and uses—even in the "wet" East—are approaching or have already exceeded available supplies.³ The possibilities for shortage have been concealed by a period of relatively high precipitation.⁴ Nevertheless, the potential problems to eastern users were underscored recently when a five-year drought brought water supplies in the Delaware basin within days of exhaustion.⁵ The need for citizens, administrators, and the legal profession to examine carefully and reform our water management laws and institutions to meet new challenges is patent.

Among the most important new challenges to our water supply are those posed by the developing national energy program. The federal government⁶ has committed the country to a program of energy self-sufficiency. On the other hand, the United States Water Resources Council already has concluded that the "availability of adequate supplies of water will be a constraint on reaching energy self-

1. Most states east of the Mississippi including Pennsylvania receive an annual precipitation in excess of thirty-five inches. U.S. Dep't of Agriculture, *Isohyetal Map* prepared for Senate Select Comm. on National Water Resources (1959) in 1 *WATERS AND WATER RIGHTS* 21 (R. Clark ed. 1967) [hereinafter cited as *WATERS AND WATER RIGHTS*].

2. See generally *NATIONAL WATER COMMISSION, A SUMMARY DIGEST OF STATE WATER LAWS* (1973) [hereinafter cited as *STATE WATER LAW DIGEST*]; 1 *WATERS AND WATER RIGHTS*, *supra* note 1, at 65-71.

3. See notes 47-65 and accompanying text *infra*.

4. The last major drought in the northeastern United States occurred from 1962 to 1965. Since 1967 annual precipitation has been near or above average and summer rainfall generally has sustained flows in all major Pennsylvania basins. Interview with O.D. White, Hydrologist in Charge, Federal State River Forecasting Center, Harrisburg, Pa., January 12, 1976.

5. See Hogarty, *The Delaware River Drought Emergency*, Inter-University Case Program ¶ 170 (1970). Simultaneously the Northeast's drought caused small streams in the Susquehanna basin to dry up and severely lowered water quality in others.

6. See Federal Energy Administration Act of 1974, 15 U.S.C.A. §§ 761-86 (Supp. 1976); Energy Supply & Environmental Coordination Act of 1974, *id.* §§ 791-98; Geothermal Energy Research, Development & Demonstration Act of 1974, 30 *id.* §§ 1101-64; Solar Heating & Cooling Demonstration Act of 1974, 42 *id.* §§ 2473, 5501-17; Energy Reorganization Act of 1974, *id.* §§ 5801-91; Federal Nonnuclear Energy Research & Development Act of 1974, *id.* §§ 5901-15; Federal Energy Policy & Conservation Act of 1975, Act of Dec. 22, 1975, Pub. L. No. 94-163, 89 Stat. 871.

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sufficiency."⁷ Although on a national scale large amounts of fresh and other water "are available and could be used for meeting energy-related needs . . . , available water supplies are poorly distributed between the several regions of the Nation with wide monthly and seasonal variation."⁸ The north Atlantic and Ohio regions, including portions of the Delaware, Susquehanna, Monongahela, Allegheny, and Ohio watersheds, have been identified as areas of variable water availability and potential shortage for energy purposes.⁹ Energy self-sufficiency will require intensive development and management of water resources,¹⁰ a mandate that may exceed the ability of existing state and federal water allocation doctrines, policies, and institutional schemes.¹¹

The purpose of this article is to focus on a portion of this problem: the available legal and institutional methods of managing consumptive water uses in thermal electric generating projects, particularly in the Commonwealth of Pennsylvania. After a brief discussion of physical and technological factors, this article will identify existing common-law, statutory, and administrative means of resolving conflicts between power plant water consumption and other users. The adequacy of remedies available to affected riparian owners, municipalities, and public water supply agencies will be analyzed. Next, the article will focus on the various state, interstate, and federal regulatory programs that address these conflicts. This discussion is intended to guide legal practitioners and administrators through the

7. U.S. WATER RESOURCES COUNCIL, WATER FOR ENERGY SELF-SUFFICIENCY—EXECUTIVE SUMMARY 3 (1974) [hereinafter cited as WRC SELF-SUFFICIENCY REPORT]; see WATER RESOURCES COUNCIL, FEDERAL ENERGY ADMINISTRATION PROJECT INDEPENDENCE BLUEPRINT, FINAL TASK FORCE REPORT, WATER REQUIREMENTS, AVAILABILITIES, CONSTRAINTS AND RECOMMENDED FEDERAL ACTIONS (1974) [hereinafter cited as PROJECT INDEPENDENCE BLUEPRINT]; Kneese & Brown, *Water Demands for Energy Development*, 8 NAT. RES. L. 309 (1975).

8. WRC SELF-SUFFICIENCY REPORT, *supra* note 7, at 3.

9. *Id.* at 4.

10. See note 7 and accompanying text *supra*. Intensive water development and management includes comprehensive water planning, allocating water among priority uses, construction of reservoirs to regulate stream flow, and a program of water conservation.

11. WRC SELF-SUFFICIENCY REPORT, *supra* note 7, at 5. For a discussion of the impact of energy development on the water laws of the western states see Clark, *Ground Water Law: Problem Areas*, 8 NAT. RES. L. 377 (1975); Dewsaup, *Problems Under State Water Laws: Initiation of New Rights*, 8 NAT. RES. L. 347 (1975); Muys, *Legal Problems Involved in Developing Water Supplies for Energy Development*, 8 NAT. RES. L. 335 (1975); Pring & Belkman, *Reclamation Law Constraints on Energy/Industrial Uses of Western Water*, 8 NAT. RES. L. 297 (1975); White, *Problems Under State Water Law: Changes in Existing Water Rights*, 8 NAT. RES. L. 359 (1975).

maze of issues and institutions involved in the energy-related consumptive water use problem and to stimulate a more constructive approach to these questions.

II. Hydrologic and Technical Aspects: An Overview

In most eastern river basins water is used repeatedly as it flows to the sea. It is withdrawn and returned through sewage plants and industrial waste discharges and withdrawn again by downstream users. Simultaneously the water is applied to "in-stream" uses, such as commercial navigation, recreation, dilution of pollutants, and maintenance of wildlife and aquatic ecosystems. The Schuylkill River is an example of intensive water use: during the 1965 drought its water was used and reused over seven times before it reached the Delaware at Philadelphia.¹²

Most water uses are relatively nonconsumptive. Ninety percent of municipal and domestic water withdrawals from streams is returned through sewage treatment plants.¹³ Of the estimated 4618 million gallons per day (MGD) withdrawn in 1970 for industrial use in Pennsylvania, only 331 MGD or 7.2 percent was consumed.¹⁴ A steady trend toward increased consumptive water use is under way, however, in electricity generation projects.

A thermal power plant uses heat from fossil or nuclear fuel to produce steam, which drives turbines to generate electricity.¹⁵ Current technology allows a relatively low efficiency for thermal power projects. Fossil fuel plants are thirty-three to forty percent efficient

12. J. McSparrin & S. Runkle, *Methods and Criteria for Adequacy of Water Sources*, paper delivered to the American Soc'y of Eng'rs, Nat'l Water Resources Eng'g Meeting, Atlanta, Ga., January 19, 1972.

13. See DELAWARE RIVER BASIN COMMISSION, WATER MANAGEMENT OF THE DELAWARE RIVER BASIN 1-39 (1975) [hereinafter cited as DRBC WATER MANAGEMENT]; PA. DEP'T OF ENVIRONMENTAL RESOURCES, OFFICE OF RESOURCES MGMT., STATE WATER PLAN PLANNING PRINCIPLES 39 (1975) [hereinafter cited as PA. PLANNING PRINCIPLES].

14. Pa. Dep't of Environmental Resources, Bur. of Resources Programming, Pennsylvania Consolidated Water Use Report—State Totals (Computer Printout, Oct. 16, 1975) [hereinafter cited as Pa. Water Use].

Agricultural irrigation is considered totally consumptive because all water used is evaporated or enters the ground. PA. PLANNING PRINCIPLES, *supra* note 13, at 19. The Delaware River Basin Commission, however, assumes that forty percent of irrigation water eventually returns to surface streams or percolates to underground aquifers. DRBC WATER MANAGEMENT, *supra* note 13, at 1-67. Diversions for irrigation represent a small portion of the total water use in the East—less than one percent of all Pennsylvania water uses in 1970 and only 8.3 percent of all consumptive uses. By 1990 irrigation withdrawals are expected to increase to two percent of the total water used in Pennsylvania. See Pa. Water Use, *supra* note 14. In the Delaware basin irrigation constitutes only two percent of the total use, but in the month of July it can represent almost one third of the total water consumed. DRBC WATER MANAGEMENT, *supra* note 13, at 1-67 to -77.

15. For a general description of thermal power plants that use nuclear fuel to produce heat see M. EL WAKIL, *Nuclear Power Engineering* 16-19 (1963).

in converting heat from combustion into usable electricity.¹⁶ Over half of the fossil fuel energy is discarded as waste heat. Similarly, nuclear power plants utilizing light water reactors¹⁷ can use only a third of the energy released by the fission process; sixty-seven percent is waste.¹⁸

The short-term problem¹⁹ is how to discharge excess heat without causing undesirable environmental impact. In fossil fuel plants a portion of the nonproductive heat is discharged directly to the air through the boiler and stack. On the other hand, most waste energy from fossil plants and virtually all nuclear plant waste heat is released through the condenser cooling system.²⁰ Because water is used for condenser cooling, the question becomes one of dissipating the heat added to the water through another cooling process.²¹ The most commonly used cooling methods, either singly or in combination, include the following: (1) once-through systems, in which water is discharged directly to a receiving water body without auxiliary cooling; (2) cooling ponds and canals, in which water is discharged to a holding area to be cooled and subsequently recirculated through the condenser system or discharged to a water body; (3) wet cooling towers, in which water is cooled by evaporation before discharge or recirculation;²² and (4) dry cooling towers, in which water is cooled by conduction and convection.²³

Prior to 1970 most fossil and nuclear plants utilized once-through cooling systems, using rivers and oceans to dissipate heat. Increased environmental concern about thermal pollution, however,

resulted in adoption of more rigorous limits on the amount and temperature of heated water that can be discharged to streams and rivers. State²⁴ and river basin commission²⁵ agencies have established in-stream water quality criteria necessary for desired uses, including maintenance of aquatic biosystems.²⁶ Thermal standards expressed in terms of both allowable increases (for example, five degrees) above the stream ambient and maximum tolerable stream temperatures²⁷ for various rivers or portions thereof are among these criteria. Discharges that will cause these in-stream limits to be exceeded are prohibited.²⁸ In addition, effluent standards have been adopted that mandate maximum tolerable thermal characteristics of heated discharges.²⁹

Similarly, under the Federal Water Pollution Control Act³⁰ the United States Environmental Protection Agency (EPA) has promulgated new source performance standards³¹ and abatement criteria

24. E.g., 25 Pa. Code §§ 93.1-96.

25. E.g., DRBC Water Quality Regulations, 18 C.F.R. § 410.1 (1975); DRBC Water Management, *supra* note 13, at A-15 to -68 (incorporating DRBC Resolutions 67-7 and 74-1 on water quality criteria).

26. 25 Pa. Code § 93.2; DRBC Water Management, *supra* note 13, at A-11 to -14.

27. 25 Pa. Code § 93.5(c); DRBC Water Management, *supra* note 13, at A-14 to -55.

28. 25 Pa. Code § 95.1; DRBC Water Management, *supra* note 13, § 3.10.3. To determine allowable quantities of pollutants in specific discharges, the assimilative capacity of the receiving stream is "allocated" among all dischargers by the regulatory agency.

29. For example, Pennsylvania's industrial waste effluent standards provide as follows:

§ 97.81. Prohibition.

The temperature of the waters of this Commonwealth shall not be increased artificially in amounts which shall be inimical or injurious to the public health or to animal or aquatic life or prevent the use of water for domestic, industrial or recreational purposes, or stimulate the production of aquatic plants or animals to the point where they interfere with these uses.

§ 97.82. Allowable discharges.

(a) The heat content of discharges shall be limited to an amount which shall not raise the temperature of the entire stream at the point of discharge 5° F. above ambient temperature or a maximum of 87° F., whichever is less, nor change the temperature by more than 2° F. during any one-hour period, assuming complete mixing but the heat content of discharges may be increased or further limited where local conditions would be benefited thereby.

(b) If downstream circumstances warrant, the specific area in which the temperature may be artificially raised above 87° F. or greater than 5° F. above ambient temperature or by more than 2° F. during any one-hour period shall be prescribed.

§ 97.85. Trout streams.

There shall be no new discharge to waters providing a suitable environment for trout if as a result the temperature of the receiving stream would be more than 5° above natural temperatures or be increased above 58° F.

25 Pa. Code §§ 97.81-82, 97.85.

30. 33 U.S.C.A. § 1251 (Supp. 1976).

31. *Id.* § 1316. A "new source" is defined as any building, structure, facility, or installation that may discharge pollutants, the construction of which is commenced after EPA's publication of proposed regulations prescribing the "best available demonstrated control technology" to be used by those sources. 33 U.S.C.A. § 1316(a).

16. KRENKEI, *et al.*, THE WATER USE AND MANAGEMENT ASPECTS OF STEAM ELECTRIC POWER GENERATION, National Water Comm'n Rep. No. NWC-CES-72-064, at 21-23 (1972) [hereinafter cited as KRENKEI].

17. Light water reactors use ordinary water to cool the reactor core and transfer heat to the electric turbines. NUCLEAR POWER SYSTEMS 223-24 (MacMillan Co., N.Y., 1964). Most commercial, nuclear electric facilities use light water reactors.

18. KRENKEI, *supra* note 16, at 21-23.

19. Electricity generation facilities generally have a lead time of ten to fifteen years. Technologies to capture and use waste heat for other beneficial purposes are under study but are expected to provide "little relief from the waste heat problem over the next 15 years . . ." KRENKEI, *supra* note 16, at 63. See Garton & Christman, Beneficial Uses of Waste Heat, and Bell, Combination Urban Power Systems Utilizing Waste Heat, in N.Y. Dep't of Environmental Conservation, Proceedings of the Conference on the Beneficial Uses of Thermal Discharges (Sept. 17-18, 1970).

20. KRENKEI, *supra* note 16, at 23.

21. *Id.* at 27.

22. Cooling towers use either natural drafts or mechanical means to circulate air and cool the heated water. Hill, Thermal Pollution and Its Control, 2 ENVIR. AFFAIRS 406 (1972).

23. KRENKEI, *supra* note 16, at 27.

consumptive, but are seven times more expensive than once-through technology and two to three times as costly as wet cooling tower systems.³⁹

The impact on water resources of installing evaporative cooling systems at power plants in eastern watersheds has only recently been perceived as significant. Nevertheless, the consumptive amounts involved are staggering. A 2010 megawatt capacity nuclear plant, for example, will withdraw eighty-six cubic feet per second (CFS) of water (or 55.6 million gallons per day (MGD)),⁴⁰ consumptive losses due to evaporation will average 34.9 MGD.⁴¹ If EPA's thermal discharge standards⁴² are strictly enforced⁴³ and all existing and new plants install evaporative cooling systems, the nationwide increase of water consumption by the year 2000 may approximate 8.5 billion gallons per day.⁴⁴ This prospective growth is said to be "relatively insignificant compared to the total water available in the United States during average flow conditions."⁴⁵ During ten- or twenty-year drought periods, however, large increases in consumption for power generation will exacerbate "water deficits" in some regions⁴⁶ and sufficient water for all users will be unavailable.

The dimensions of the problem can be illustrated by two Pennsylvania watersheds, the Schuylkill and Monongahela River basins. In the Schuylkill River, for example, the seven-day average low flow at Philadelphia during the drought of record did not exceed 194 MGD.⁴⁷ Five percent of the time, flow can be expected to fall below 155 MGD.⁴⁸ Philadelphia withdraws from the Schuylkill an av-

39. Using 1969 costs the Federal Power Commission has estimated that contemporary

dry tower designs range from \$18-\$32 per KW [i.e., 40] in capital cost (as opposed to \$2-\$5 per KW for once-through systems, \$4-\$9 per KW for cooling ponds, and \$5-\$13 per KW for evaporative cooling towers) and are quite costly to operate and maintain, especially since they reduce the plant's average annual energy output by six to eight percent (and require the construction of an additional 12-16 percent installed capacity).

Id. at 58, citing FED. POWER COM'n, THE 1970 NATIONAL POWER SURVEY, Part I, at 1-10-8 (1972).

40. One CFS of water flow is equal to 4.48 MGD.

41. FED. POWER COM'n, THE 1970 NATIONAL POWER SURVEY, Part I, at 1-10-17 (1972); see DRBC 1975 Master Siting Study, *supra* note 31, at A-61.

42. See notes 30-36 and accompanying text *supra*.

43. This assumes no exemptions or variances are issued by the EPA Administrator pursuant to 33 U.S.C.A. §§ 1311(c), 1326 (Supp. 1976).

44. 39 Fed. Reg. 36186, 36193 (1974).

45. *Id.* (emphasis added).

46. *Id.*

47. This figure represents the observed amount of flow past Fairmount Dam, DRBC WATER MANAGEMENT, *supra* note 13, at 1-3, plus reported water withdrawals by the City of Philadelphia at that location. Interview with J. McSparrin, Chief, Div. of Comprehensive Resources Programming, Office of Resources Management, Pa. Dept. of Environmental Resources, January 9, 1976.

48. Busch & Shaw, *Pennsylvania Streamflow Characteristics, Low Flow Frequency and Flow Duration*, PA. WATER RESOURCES BULL. NO. 1, at 75 (1966) [hereinafter "Busch & Shaw"]; see also, e.g., *Report of the Pennsylvania Department of Environmental Resources, Office of Resources Management, Division of Comprehensive Resources Programming, Low Flow Frequency and Flow Duration*, PA. WATER RESOURCES BULL. NO. 1, at 75 (1966) [hereinafter "Busch & Shaw"].

for existing sources.³² By July 1, 1983, dischargers must apply "best available technology,"³³ which for steam-electric power plants has been determined to include closed cycle,³⁴ evaporative cooling tower systems that release no heat to streams and rivers.³⁵ Cooling tower systems also are required for all "new source" power plants constructed after March 4, 1974.³⁶

The mandate of both state and federal water pollution control programs has been to eliminate once-through cooling systems in favor of evaporative ("wet") cooling towers and, in limited instances, cooling ponds.³⁷ These choices have involved considerable water resource compromises. Although once-through methods require large withdrawals and discharge nearly all waste heat to the receiving water body, only minor amounts are consumed. The amount of water available for downstream use is virtually unaffected. Wet cooling towers, on the other hand, require smaller withdrawals and eliminate thermal discharges, but are highly consumptive of water.³⁸ Dry cooling towers necessitate almost no water withdrawals and are non-

32. *Id.* § 1311.

33. *Id.* § 1311(b)(2).

34. "Closed cycle" as used by EPA in this context means that no heated water is discharged to waters of the United States. It does not imply that 100% of the cooling water is recirculated through the power plant, but rather contemplates that substantial quantities will be evaporated. See 39 Fed. Reg. 8294, 8295-96 (1974) (notice of proposed rulemaking); *id.* at 36186, 36193 (explanation of comments on notice of proposed rulemaking).

35. 40 C.F.R. § 423.13(1) (1974). As finally adopted EPA's rules will require installation of best available technology to control thermal discharges from recently constructed power plants by July 1, 1981, unless it is shown that compliance will seriously affect power system reliability in a region. If reliability problems are demonstrated, a scheduled installation of cooling tower systems must be undertaken so that all plants in a region comply on or before July 1, 1983. *Id.* § 423.13(m)-(n). EPA rules, however, do not require control of thermal discharges from "old units"—those plants of greater than 500 megawatts (MW) placed in service before January 1, 1970, or less than 500 MW installed before January 1, 1974. *Id.* §§ 423.20-33. Moreover, the Federal Water Pollution Control Act allows the EPA Administrator to modify the best available technology limitations on thermal discharges for any source if it is demonstrated that these standards are "more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made" 33 U.S.C.A. § 1326(a) (Supp. 1976).

36. 40 C.F.R. § 423.16(1) (1974); see note 31 *supra*.

37. Existing cooling ponds or those under construction before July 1, 1981, can be used for cooling power plants. 40 C.F.R. § 423.12(a); 39 Fed. Reg. 36186, 36200 (1974). In addition, EPA has the authority to modify the thermal standards contained in its rules if the limitations as applied to a particular source are found "more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made" 33 U.S.C.A. § 1326(a) (Supp. 1976).

38. KRENKE, *supra* note 16, at 29.

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erage of 180 MGD for public water supply purposes⁴⁹ and has an adjudicated right to 200 MGD.⁵⁰ Philadelphia, however, is not the only water user. Currently the Limerick power plant is under construction along the Schuylkill River in Montgomery County, Pennsylvania. When its two nuclear units are in full operation, Limerick will consume an average of 34.9 MGD.⁵¹ The potential conflicts among power, municipal, industrial, and other uses during drought conditions are obvious. Similarly, in the Monongahela basin power, navigation, and public water needs compete for inadequate supplies. Low flow of the Monongahela above its confluence with the Schuylkill is only 340 CFS or 220 MGD.⁵² Virtually all this flow represents releases from the Army Corps of Engineer's Tygart Reservoir, which is designed to maintain commercial navigation on the river.⁵³ Interbasin transfers to supply water to metropolitan Pittsburgh remove forty MGD.⁵⁴ Under current circumstances low flows—even augmented by Tygart—are inadequate to support both public water supply and navigation demands during a ten-year drought.⁵⁵ Consumption by current and proposed power facilities

Dep't of Environmental Resources, *Long Duration Low Flow of Pennsylvania Stream*, Pa. Water Resources Div., No. 7, at 80 (1972).

49. Public Water Supply Annual Water Use Reports (on file with the Pa. Dept. of Environmental Resources, Division of Dams and Encroachments).

50. In 1932 the Philadelphia Suburban Water Company was enjoined from interfering with the diversion of water from Perkiomen Creek to tributary to the Schuylkill, with a flow of the Schuylkill River at Philadelphia of 200,000,000 gallons per day, over and above the requirements of navigation. *Philadelphia v. Philadelphia Suburban Water Co.*, 309 Pa. 130, 151, 163 A. 297, 300 (1932).

51. See Delaware River Basin Electric Utilities Group, *Master Siting Study—Major Electric Generating Projects—Delaware River Basin* 1975-1989, report to the Delaware River Basin Commission, at A-60 to 61 (1975) [hereinafter cited as DRBC *Master Siting Study*].

52. Letter from Col. N.G. Delbridge, Pittsburgh Dist., U.S. Army Corps of Engineers, to V.R. Butler, Chief, Div. of Dams & Encroachments, Pa. Dept. of Environmental Resources, Oct. 16, 1973.

53. *Id.*
54. "The Western Pennsylvania Water Company withdraws water from the Monongahela at Thama for service to portions of Pittsburgh and suburban areas in Allegheny and Washington counties. Although the company holds an allocation permit for up to 50 MGD at Thama, the Thama works currently has a capacity of only 40 MGD. This water is returned through sewage treatment plants on the lower Monongahela and Ohio Rivers and, therefore, the withdrawal is properly classified as an interbasin transfer that effectively removes 40 MGD from the upper Monongahela watershed. See Pa. Dept. of Environmental Resources, *Application for Water Allocation No. 0271601* by Western Pa. Water Co. (August 15, 1973); *Id.*, supplements on Aug. 15, 1973 and Sept. 25, 1974; Letter from Col. N.G. Delbridge, Pittsburgh Dist., Army Corps of Engineers, to V.R. Butler, Chief, Div. of Dams & Encroachments, Pa. Dept. of Environmental Resources, Oct. 16, 1973; Letter from Col. M.R. Janatow, Jr., Pittsburgh Dist., Army Corps of Engineers, to V.R. Butler, Feb. 27, 1975; Memo from R. Timothy Weston to Walter A. Lyon, Oct. 5, 1975.

55. Authorities cited note 54 *supra*. A ten year drought is a drought that on

in Pennsylvania and West Virginia can reach 33.9 MGD.⁵⁶ Therefore, navigation requirements, consumptive power uses, public water supply transfers, and other losses⁵⁷ in the upper Monongahela will exceed available flow during a predictable drought.⁵⁸

Even on the Susquehanna River, the largest United States river flowing to the Atlantic, consumptive water needs for power plants may become significant. By 1989 total power project consumptive uses are projected to approach ten percent of the seven-day minimum flow⁵⁹ of the river.⁶⁰ Proposals for one or more energy parks⁶¹ in the upper Susquehanna basin could result in even more substantial water demands. A 10,000 mega-watt park composed of five fossil fuel and five nuclear plants would evaporate 250-300 CFS,⁶²

the average has a ten percent chance of occurring in any one year. The low flow is often expressed in terms of the lowest consecutive seven-day average flow of such a drought (the seven-day, ten-year low flow), a level that is exceeded approximately ninety percent of the time. When such a drought occurs, critical low flows may last several months, causing depletion of reservoir storage and major shortages for users.
56. Pa. Water Use, *supra* note 14, Watershed 19 B, C, and D points. Current power facilities using once through cooling withdraw in excess of 1031 MGD and consume approximately twelve MGD. Although most of the water diverted by each power plant is returned and reused by lower plants, the 729 MGD withdrawal of the largest plant (Haffield) exceeds by several times the low flow of the river. Haffield is planning to install a cooling tower to control thermal discharges. This may improve the temperature in the river at low flow, but also will result in increased consumptive losses by approximately twenty-three MGD or ten percent of the present low flow.

57. Army Corps of Engineers gaging records indicate that on November 20, 1953, during a drought episode on the Monongahela, a low flow of 269 CFS was recorded at the Chalfont station (sixteen miles above Elrama), even though 340 CFS was being released from the upstream Tygart Dam. The loss of seventy-one CFS (twenty-six MGD) is not explained, but substantial infiltration of river waters into active and abandoned coal mines is suspected. Letter from Col. N.G. Delbridge to V.R. Butler, *supra* note 54; Memo from R. Timothy Weston to Walter A. Lyon, *supra* note 54, at 2-4.

58. Criteria for judging adequacy of water supplies generally require availability of supplies even under fifty-year drought conditions. Pa. Planning Parameters, *supra* note 13, at 49-50. Yet, on the Monongahela River even a ten-year drought, such as occurred in 1953, could create severe conflicts and shortages. See note 57 *supra*.

59. The seven-day minimum flow is the lowest seven-day average flow of record.

60. The seven-day minimum flow of the Susquehanna at Marietta, Pennsylvania is 1720 CFS. Consumptive water use by power projects in 1989 is projected to total 165.4 CFS. Susquehanna River Basin Electric Utilities Group, *Master Siting Study* Susquehanna River Basin Major Electric Generating Projects 1975-1989, Report to the Susquehanna River Basin Commission, at 20 (1975) [hereinafter cited as SRBC 1975 Master Siting Study]. The Susquehanna River Basin Commission has indicated that a reduction of the minimum flow passing Conowingo Dam (below the Maryland/Pennsylvania border) will not be allowed. The minimum releases from the Raystown Reservoir (now nearing completion) and augmentation from "other existing and proposed reservoirs can be expected to increase the minimum flow (averaged over any seven days) past Conowingo Dam, or alternatively to permit an equal consumptive use while maintaining the current minimum flow averages passing Conowingo Dam." *Id.* at 19.

61. Gilbert Associates, Inc., Report #1855, *Energy Park Development Site Identification Study* (Nov. 1973).

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which is equal to nearly one-half of the ten-year low flow of the west branch of the Susquehanna or, eighteen percent of the main branch at Sunbury.⁶² The necessity and extent of additional reservoir capacity to provide for these consumptive uses is, thus, a vital issue for the entire basin.⁶³

A decade ago Senator Frank Moss states, "For the next generation of Americans, I believe it is not an exaggeration to say that water—its competing uses and the conflicts that arise out of those uses—may be the most critical national problem."⁶⁴ In Pennsylvania and its sister states water conflicts among municipal suppliers, industry, agricultural users, and energy development are on the horizon or, in some cases, already at hand. Lawyers and administrators must seek to develop new laws and institutions to resolve these conflicts. As the remaining sections of this article will demonstrate, current legal doctrines, regulations, and administrative arrangements are not capable of managing consumptive water withdrawals by projects and protecting the interests of other water users.

III. Common-Law Approaches to Consumptive Uses

The problem of consumptive water use was first addressed by the common law. In Pennsylvania the right to take and consume water arises from riparian ownership, prescription, and condemnation.⁶⁵

A. Riparian Rights

Most eastern states have adopted the English common-law doctrine of riparian rights as applied to surface waters.⁶⁷ The riparian

doctrine governs allocation and use of waters flowing in a natural watercourse.⁶⁸ Rights under the doctrine arise from the ownership⁶⁹ of real property underlying or bordering streams and rivers.⁷⁰ A riparian right, then, is the right to use water flowing in a stream upon riparian land.⁷¹

1. *Nature and Limit of Riparian Rights.*—The holder of riparian rights has no property interest in the water itself, but only a right to use the water.⁷² Furthermore, even this right is not exclusive. All rights to water use by a riparian owner depend upon the equal,

what dated in their factual settings, often involving gristmill owners and barge canal proprietors, they are, nevertheless, applicable today and form the basis of current riparian law in Pennsylvania.

68. The terms "natural watercourse" or "stream" refer to water flowing in a definite channel with a bed and banks or sides. 93 C.J.S. *WATERS* §§ 3-4, at 596-601 (1956); 39 PA. LAW ENCYC. *WATERS* § 1, at 446 (1961); 1 *WATERS AND WATER RIGHTS*, *supra* note 1, § 52.1(8), at 308-13. The general elements of a watercourse are a channel, consisting of a well-defined bed and banks, a current of water, and a source. A flow and a place of discharge are generally implied. None of these elements or characteristics are considered to be an absolute fixed factor and too much stress should not be placed on any one. 93 C.J.S. *WATERS* § 3, at 596 (1956). Water flowing in natural watercourses is, however, distinguished from "diffused surface waters." 1 *WATERS AND WATER RIGHTS*, *supra*, at 300-303.

A commonly accepted definition of a watercourse is a "stream of water usually flowing in a definite channel having a bed and sides, or banks, and discharging itself into some other stream or body of water." 28 Am. & Eng. Ency. of Law (1st ed.), 944. More drainage over the surface of land is very different from the flow of a stream or brook across the premises of another. "In general the channel and banks formed by the flowing of the water must present to the eye on a casual glance, the unmistakable evidence of the frequent action of running water (Gould on Waters [2d ed.] sec. 264); but the water need not flow continually, and there are many watercourses which are sometimes dry. There is, however, a distinction to be taken in law between a regular flowing stream of water, which at certain seasons is dried up, and those occasional bursts of water, which in time of freshet, or melting of ice and snow descend from the hills and inundate the country." Angell on Water Courses (7th ed.), sec. 4.

Kislinski v. Gilboy, 19 Pa. Super. 453, 454-55 (1902); accord, Kunkle v. Ford City Borough, 305 Pa. 416, 158 A. 159 (1931).

69. Ownership of riparian land without actual possession or occupancy is sufficient to give riparian rights, including a right of action against any person transgressing those rights. Hogg v. Connellsville Water Co., 168 Pa. 436, 31 A. 1010 (1895).

70. 1 *WATERS AND WATER RIGHTS*, *supra* note 2, at 288-89. Riparian rights inhere to all riparian owners, including individuals, Gibbs v. Sweet, 20 Pa. Super. 275 (1902), business corporations, Lord v. Meadville Water Co., 135 Pa. 122, 19 A. 1007 (1896), Finn v. Providence Gas & Water Co., 99 Pa. 631 (1882), municipalities, Appeal of Haupt, 125 Pa. 211, 17 A. 436 (1889), the Commonwealth, Filbert v. Dechert, 22 Pa. Super. 361 (1901), and the federal government. Riparian rights can be exercised by a qualified and authorized agent of a riparian owner, Filbert v. Dechert, 22 Pa. Super. 362 (1901), or by the lessee of riparian lands, Philadelphia & Reading R.R. v. Pottsville Water Co., 182 Pa. 418, 38 A. 104 (1897); Standard Plate Glass Co. v. Butler Water Co., 5 Pa. Super. 563 (1897).

71. Appeal of Helman, 4 Wall. 35 (Pa. 1882); Garvin v. Miller, 20 Beaver 95 (Pa. C.P. 1958); Hough v. Doylestown Borough, 4 Brewst. 333 (C.P. Bucks 1870).

72. Mayor of City of Philadelphia v. Commissioner of Spring Gardens, 7 Pa. 348 (1847). In property law riparian water rights are classified as usufructuary rights, a type of incorporeal hereditament. 1 *WATERS AND WATER RIGHTS*, *supra* note 1, § 53.2, at 349-51; Hough v. Doylestown Borough, 4 Brewst. 333 (C.P. Bucks 1870).

uses and Recommendations, Vol. I (prepared for the Governor's Energy Council), at 15-16 (1975) [hereinafter cited as Ferrai].

63. See Burch & Shaw, *supra* note 48, at 142.

64. See Ferrai, *supra* note 62, at 15-16. Note, on January 23, 1976, the Governor's Energy Council suspended indefinitely any further consideration of power parks. See Minutes of the Governor's Energy Council, January 23, 1976.

65. F. MOSS, *THE WATER CRISIS* ix (1967).

66. Palmer Water Co. v. Lehighon Water Co., 280 Pa. 492, 124 A. 747 (1924).

67. STATE WATER LAW DRIFT, *supra* note 2, at 3; 1 *WATERS AND WATER RIGHTS*, *supra* note 1, at 61-66. The development of riparian doctrine in Pennsylvania took place, for the most part, during the latter half of the nineteenth century and the early part of the twentieth century. Subsequent to that period, there has been a shift to statutory control of water rights, see notes 392 to 395 and accompanying text *infra*, but most cases delineating riparian rights and duties were decided during the early days of the Industrial Revolution. While the original cases are some-

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correlative rights of other riparians. Riparian proprietors are tenants in common of a shared resource.⁷³ No right to divert or consume a specific quantity of water exists.

(a) *Uses on riparian lands.*—Under the English version of the doctrine the measure of the right to use water on riparian land was natural flow. A riparian proprietor enjoyed "the usufructuary right to the ordinary flow along or over his land, in its customary channel, undiminished in quantity and unimpaired in quality except as changed by act of God."⁷⁴ With certain exceptions a riparian owner had a right of action against any individual whose unlawful conduct caused a material and perceptible diminution in the flow over the aggrieved riparian's land.⁷⁵ The flow could not be diminished regardless of its effect on the uses of lower riparians. Therefore, consumptive water users, such as industry, agriculture, and power plants, were technically unlawful. Faced with the adverse economic impact of this result at the beginning of the Industrial Revolution, a majority of the American jurisdictions following the riparian doctrine modified the so-called natural flow or English rule.⁷⁶ In its place they adopted a reasonable use standard allowing some diminution in flow if other riparian users were not unreasonably harmed.⁷⁷

Pennsylvania developed a hybrid of the natural flow and reasonable use rules. A fusion (or perhaps confusion) of the language

73. Cf. *Philadelphia & Reading R.R. v. Pottsville Water Co.*, 182 Pa. 418, 38 A. 404 (1897); *Harley v. Medisoppen Water Co.*, 174 Pa. 416, 34 A. 368 (1896); *Irving's Ex's v. Borough of Media*, 10 Pa. Super. 132 (1899), *aff'd*, 194 Pa. 648, 45 A. 482 (1900); *Lehigh Coal & Nav. Co. v. Scranton Gas & Water Co.*, 6 Pa. Dist. 291 (C.P. Lack. 1896); *Hough v. Doylestown Borough*, 4 Brewst. 333 (C.P. Bucks 1870).

74. 1 *WATERS AND WATER RIGHTS*, *supra* note 1, § 51.2, at 289; *accord*, *Helms v. Zeltzoff*, 407 Pa. 482, 181 A.2d 277 (1962); *White v. Pennsylvania R.R.*, 354 Pa. 397, 47 A.2d 200 (1946); *Williams v. Fulmer*, 151 Pa. 405, 25 A. 103 (1892); *Standard Plate Glass Co. v. Butler Water Co.*, 5 Pa. Super. 563, 582-83 (1897); *Lancaster Milling Co. v. Media Heights Golf Club*, 59 Lanc. 159 (Pa. C.P. 1964); *Rennekamp v. Goldberg*, 54 Montg. 61 (Pa. C.P. 1936).

75. *Pennsylvania R.R. v. Miller*, 112 Pa. 34, 3 A. 780 (1886); *Miller v. Miller*, 9 Pa. 74 (1848) (recovery for diminution despite lack of actual damage); *Consolidated Water Supply Co. v. State Hosp. for Criminally Insane*, 66 Pa. Super. 610 (1917); *Craig v. Borough of Shippensburg*, 7 Pa. Super. 526 (1898); *Standard Plate Glass Co. v. Butler Water Co.*, 5 Pa. Super. 563 (1897).

It is no defense that the plaintiff also uses the water in a manner that causes material diminution in the flow to owners below him, *Scranton Gas & Water Co. v. Delaware, E. & W.R.R.*, 240 Pa. 604, 88 A. 24 (1913), or that the plaintiff does not use the water at all, *Hughesville Water Co. v. Person*, 182 Pa. 450, 38 A. 584 (1897); *Miller v. Miller*, *supra*; *Craig v. Borough of Shippensburg*, *supra*.

76. 1 *WATERS AND WATER RIGHTS*, *supra* note 1, § 51.3, at 29; 92; 5 R. POWELL, *LAW OF REAL PROPERTY* § 711 (1949).

77. See note 76 *supra*; *Hanks, The Law of Water in New Jersey*, 22 *KENTON L. REV.* 621, 630-32 (1968).

of the English and American rules is found in many of the later cases.⁷⁸ Thus, some analysis of the treatment accorded various water uses in different settings is necessary to identify the current status of consumptive water uses by power plants under Pennsylvania law.

Under both English and American rules a riparian owner's use of water for domestic purposes is paramount.⁷⁹ A riparian owner can divert, use, and consume any amount necessary for household⁸⁰ and general domestic needs,⁸¹ including drinking, bathing, cooking, laundry,⁸² livestock watering,⁸³ and other uses essential to preservation of life and health.⁸⁴ A riparian can divert water for these purposes even though a watercourse's flow is materially diminished or a small stream is entirely consumed.⁸⁵ Any diminution in flow and resulting harm to downstream riparians is *damnum absque injuria*.⁸⁶

The English rule and some early Pennsylvania cases suggest that apart from domestic needs no use of water could materially di-

78. See *Helms v. Zeltzoff*, 407 Pa. 482, 181 A.2d 277 (1962); *White v. Pennsylvania R.R.*, 354 Pa. 397, 47 A.2d 200 (1946); *Williams v. Fulmer*, 151 Pa. 405, 25 A. 103 (1892); *Clark v. Pennsylvania R.R.*, 145 Pa. 438, 22 A. 929 (1891); *Miller v. Miller*, 9 Pa. 74 (1848); *Irving's Ex's v. Borough of Media*, 10 Pa. Super. 132 (1899), *aff'd*, 194 Pa. 648, 45 A. 482 (1900); *Standard Plate Glass Co. v. Butler Water Co.*, 5 Pa. Super. 563 (1897); *Lancaster Milling Co. v. Media Heights Golf Club*, 59 Lanc. 159 (Pa. C.P. 1964).

79. *Philadelphia v. Philadelphia Suburban Water Co.*, 309 Pa. 120, 163 A. 297 (1932) (diversion for domestic uses superior to public right of navigation); *Palmer Water Co. v. Lehighon Water Co.*, 280 Pa. 492, 124 A. 747 (1924) (domestic uses superior to mechanical and manufacturing uses).

80. A "household" is not limited to a home or family unit. The right to use water for domestic or household purposes is unaffected by the riparian user's living in a home, hospital, tent, or even out in the open on the riparian land. *Filbert v. Dechert*, 22 Pa. Super. 362 (1903).

81. *Palmer Water Co. v. Lehighon Water Co.*, 280 Pa. 492, 124 A. 747 (1924); *Brown v. Kistler*, 190 Pa. 499, 42 A. 885 (1899); *Philadelphia & Reading R.R. v. Pottsville Water Co.*, 182 Pa. 418, 38 A. 404 (1897); *Lord v. Meadville Water Co.*, 135 Pa. 122, 19 A. 1007 (1890); *Pennsylvania R.R. v. Miller*, 112 Pa. 34, 3 A. 780 (1886); *City of Philadelphia v. Collins*, 68 Pa. 106 (1871); *Filbert v. Dechert*, 22 Pa. Super. 362 (1903); *Irving's Ex's v. Borough of Media*, 10 Pa. Super. 132 (1899), *aff'd*, 194 Pa. 648, 45 A. 482 (1900); *Standard Plate Glass Co. v. Butler Water Co.*, 5 Pa. Super. 563 (1897); *Lancaster Milling Co. v. Media Heights Golf Club*, 59 Lanc. 159 (Pa. C.P. 1964); *Wilkes-Barre Water Co. v. Lehigh Coal & Nav. Co.*, 14 Luz. 319 (Pa. C.P. 1885).

82. *Lord v. Meadville Water Co.*, 135 Pa. 122, 19 A. 1007 (1890); *Pennsylvania R.R. v. Miller*, 112 Pa. 34, 3 A. 780 (1886); *Filbert v. Dechert*, 22 Pa. Super. 362 (1903); *Lancaster Milling Co. v. Media Heights Golf Club*, 59 Lanc. 159 (Pa. C.P. 1964).

83. *Brown v. Kistler*, 190 Pa. 499, 42 A. 885 (1899); *Lord v. Meadville Water Co.*, 135 Pa. 122, 19 A. 1007 (1890); *Pennsylvania R.R. v. Miller*, 112 Pa. 34, 3 A. 780 (1886); *Wilkes-Barre Water Co. v. Lehigh Coal & Nav. Co.*, 14 Luz. 319 (Pa. C.P. 1885).

84. *Filbert v. Dechert*, 22 Pa. Super. 362 (1903).

85. *Brown v. Kistler*, 190 Pa. 499, 42 A. 885 (1899); *Pennsylvania R.R. v. Miller*, 112 Pa. 34, 3 A. 780 (1886); *Lancaster Milling Co. v. Media Heights Golf Club*, 59 Lanc. 159 (Pa. C.P. 1964) (dictum).

86. *Brown v. Kistler*, 190 Pa. 499, 42 A. 885 (1899); *Clark v. Pennsylvania R.R.*, 145 Pa. 438, 22 A. 989 (1891); *Pennsylvania R.R. v. Miller*, 112 Pa. 34, 3 A. 780 (1886); *Filbert v. Dechert*, 22 Pa. Super. 362 (1903); *Standard Plate Glass Co. v. Butler Water Co.*, 5 Pa. Super. 563 (1897); *Lancaster Milling Co. v. Media Heights Golf Club*, 59 Lanc. 159 (Pa. C.P. 1964).

prices.⁸⁷ A riparian owner can use only that quantity of water for extraordinary purposes that is reasonable in view of the rights of other riparian owners and that will not materially or perceptibly diminish the watercourse's flow.⁸⁸ An extraordinary use is not presumptively unreasonable,⁸⁹ however. Its reasonableness "depends upon the circumstances of each case, and is a question for the jury; the character of the stream, the purpose to which water is applied, and the manner of application are important considerations in determining this question."⁹⁰ The stream's size and the requirements of lower riparian owners enter the reasonableness equation.⁹¹ On the other hand, the extent of the extraordinary user's business or manufacturing needs is not considered in determining the reasonableness of his use because the necessities of one man's business cannot be the standard for another's rights in something that belongs to both.⁹²

Despite the mixed reference by Pennsylvania courts to the requirements of reasonableness and nondiminution in flow, the primary emphasis regarding extraordinary uses appears to be on the quantity taken relative to the size of the watercourse.⁹³ Often extraordinary uses for manufacturing, milling, or power production will not substantially diminish a watercourse's flow,⁹⁴ in which case they are likely to be deemed reasonable.⁹⁵

97. *Hemkamp v. Chidberg*, 54 Mont. 61 (Pa. C.P. 1936).
98. *Palmer Water Co. v. Lehigh Water Co.*, 280 Pa. 492, 14 A. 747 (1924); *Scranton Gas & Water Co. v. Delaware, L. & W.R.R.*, 240 Pa. 604, 88 A. 24 (1913) (cited in); *Brown v. Kistler*, 190 Pa. 499, 42 A. 885 (1899); *Clark v. Pennsylvania R.R.*, 143 Pa. 438, 22 A. 989 (1891); *Pennsylvania R.R. v. Keller*, 112 Pa. 34, 3 A. 780 (1886); *Filbert v. Dechert*, 27 Pa. Super. 362 (1903); *Standard Plate Glass Co. v. Butler Water Co.*, 5 Pa. Super. 563 (1897); *Houder v. Kite & Wyoming Valley R.R.*, 11 Pa. Super. 247 (Pa. C.P. 1910).
99. *Standard Plate Glass Co. v. Butler Water Co.*, 5 Pa. Super. 563, 585 (1897); *Wilkes-Barre Water Co. v. Lehigh Coal & Nav. Co.*, 14 Luz. 319, 325 (Pa. C.P. 1885) (appropriation and conversion to steam locomotives is not per se unreasonable, but it can become unreasonable because of the amount taken).
100. This quote, taken from the lower court's charge to the jury, was held to be a correct statement of the elements to be considered in determining reasonableness in *Brown v. Kistler*, 190 Pa. 499, 505, 42 A. 885 (1899).
101. *Brown v. Kistler*, 190 Pa. 499, 42 A. 885 (1899); *Clark v. Pennsylvania R.R.*, 143 Pa. 438, 22 A. 989 (1891); *Pennsylvania R.R. v. Miller*, 112 Pa. 34, 3 A. 780 (1886).
102. *Philadelphia & Reading R.R. v. Pottsville Water Co.*, 182 Pa. 418, 38 A. 404 (1897); *Clark v. Pennsylvania R.R.*, 143 Pa. 438, 22 A. 989 (1891); *Pennsylvania R.R. v. Miller*, 112 Pa. 34, 3 A. 780 (1886); *Wilkes-Barre Water Co. v. Lehigh Coal & Nav. Co.*, 14 Luz. 319 (Pa. C.P. 1885).
103. "The question is whether his use of the stream is reasonable and appropriate to the size of the stream and the quantity of water usually flowing there."
104. *Palmer Water Co. v. Butler Water Co.*, 5 Pa. Super. 563, 584 (1897).
105. *Palmer Water Co. v. Lehigh Water Supply Co.*, 280 Pa. 492, 124 A. 747 (1924); *Clark v. Pennsylvania R.R.*, 143 Pa. 438, 22 A. 989 (1891); *Myers & Ervin Co. v. Philadelphia, T. & C. Ry.*, 12 Mont. 46 (Pa. C.P. 1896).
106. There may be exceptions when a use is totally unnecessary. See, e.g., *Hughesville Water Co. v. Person*, 182 Pa. 450, 38 A. 584 (1897) (diversion the

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diminish the quantity flowing to lower riparian lands.⁹⁷ Nondomestic uses were deemed "extraordinary."⁹⁸ The courts gradually recognized, however, that some uses on riparian lands were necessarily consumptive. If stringently enforced, the English rule would completely bar irrigation,⁹⁹ for example. Pennsylvania cases subsequently held that riparians could divert water for irrigation. The extent to which this diversion and consumption will be allowed "depends on whether it is reasonable, having due regard to the condition and circumstances of other proprietors on the stream."¹⁰⁰ Diversion for irrigation is not permissible when it would "destroy or materially diminish or impair the application of water by other proprietors."¹⁰¹ In other words, riparian irrigators can materially diminish the flow of a watercourse, but they cannot substantially or irretrievably impair the uses of lower owners.

Pennsylvania decisions have continued to distinguish a class of "extraordinary" water uses that are not "incident to lands for ordinary purposes,"⁹² such as manufacturing,⁹³ milling,⁹⁴ diversions by railroads for their engines,⁹⁵ diversions to supply municipalities without the use of eminent domain,⁹⁶ and diversions for recreational enter-

87. *Whitely v. Christian*, 24 Pa. 298 (1855) (consumptive use of water for operating lead mine on riparian land unlawful); *Miller v. Miller*, 9 Pa. 74 (1818) (use of water for irrigation of farmland through which watercourse flowed unlawful).
88. The distinction between domestic and extraordinary uses is implicit in the court's statement in *Palmer Water Co. v. Lehigh Water Supply Co.*, 280 Pa. 492, 499, 124 A. 747, 749 (1924), that every riparian owner is entitled to use as much of the stream as is necessary for domestic needs, but use for extraordinary purposes must not diminish quantity.
89. Because water applied to irrigation evaporates or enters the groundwater, it is treated for purposes of surface water diversions as 100% consumptive. Pa. *WATER RIGHTS*, note 14 *supra*, at 15.
90. *Messinger's Appeal*, 109 Pa. 285, 238, 4 A. 162, 162-63 (1885).
91. *Id.*
92. *Irving's Ex'r v. Borough of Media*, 10 Pa. Super. 132 (1898), *aff'd*, 194 Pa. 648, 45 A. 482 (1899); *Myers & Ervin Co. v. Philadelphia, T. & C. Ry.*, 12 Mont. 46 (Pa. C.P. 1896).
93. *Standard Plate Glass Co. v. Butler Water Co.*, 5 Pa. Super. 563 (1897) (manufacture of glass).
94. *Irving's Ex'r v. Borough of Media*, 10 Pa. Super. 132, 133 (1899), *aff'd*, 194 Pa. 648, 45 A. 482 (1900) (party's diversion to furnish power to mill termed an "artificial" use); *Bessell v. Shuff*, 4 Dall. 211 (Pa. 1800) (classification of mill as extraordinary use implicit in court's charge that millowner's water use must not injure other riparians and that diverted water must be returned to stream).
95. *Clark v. Pennsylvania R.R.*, 143 Pa. 438, 22 A. 989 (1891); *Pennsylvania R.R. v. Miller*, 112 Pa. 34, 3 A. 780 (1886); *Wilkes-Barre Water Co. v. Lehigh Coal & Nav. Co.*, 14 Luz. 319 (Pa. C.P. 1885).
96. *Irving's Ex'r v. Borough of Media*, 10 Pa. Super. 132 (1898), *aff'd*, 194 Pa. 648, 45 A. 482 (1899).

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(b) *Uses off riparian lands.*—While an extraordinary use on the riparian land itself is permissible if it is reasonable and does not materially diminish the flow of the watercourse, a use that diverts water away from the riparian land is totally prohibited irrespective of reasonableness and nondiminution considerations.¹⁰⁶ A railroad company's pumping of water to a reservoir several miles distant for use away from its riparian land¹⁰⁷ or a water company's diversion of water to a distant municipality for consumer use¹⁰⁸ cannot be justified by the diverter's ownership of riparian land and a cause of action for this diversion will accrue to other riparian owners. Rights to use water off riparian lands can be acquired only by municipalities and utilities through eminent domain or prescriptive rights.¹⁰⁹

(c) *Priorities.*—Priority of use depends upon the relative rights of riparian owners. When all else is equal, priority belongs to the more important use recognized under riparian law. Domestic uses and uses naturally related to riparian land are superior to extraordinary uses carried out on the riparian premises.¹¹⁰ Extraordinary uses rank above uses that divert water away from the riparian property.¹¹¹ If a conflict arises among several extraordinary uses on riparian land, no use priority exists and each riparian owner is required to limit use to an amount that is reasonable relative to the competing uses and that does not materially diminish flow.¹¹²

Pa. Super. 362 (1903) (diversion of water to operate a fountain on the grounds of a mental institution not a necessary use).

106. Markleton Hotel Co. v. Connelville S.L. Ry., 242 Pa. 569, 89 A. 703 (1914); Scranton Gas & Water Co. v. Delaware, L. & W.R.R., 240 Pa. 604, 88 A. 24 (1913); Lind v. Meadville Water Co., 135 Pa. 122, 19 A. 1007 (1890); Consolidated Water Supply Co. v. State Hosp. for Criminally Insane, 66 Pa. Super. 610 (1917); Irving's Ex's v. Borough of Media, 10 Pa. Super. 132 (1899), *aff'd*, 194 Pa. 618, 45 A. 482 (1900); Standard Plate Glass Co. v. Butler Water Co., 5 Pa. Super. 563 (1897).

107. Scranton Gas & Water Co. v. Delaware L. & W.R.R., 240 Pa. 604, 88 A. 24 (1913).

108. Irving's Ex's v. Borough of Media, 10 Pa. Super. 132 (1899), *aff'd*, 194 Pa. 618, 45 A. 482 (1900); Craig v. Borough of Shippensburg, 7 Pa. Super. 526 (1898); Standard Plate Glass Co. v. Butler Water Co., 5 Pa. Super. 563 (1897). *But see* Hland v. Tipton Water Co., 722 Pa. 285, 71 A. 101 (1908) (court refused to enjoin water company with legal right to supply township's inhabitants from supplying water to railroad company that subsequently piped the water to points outside the township).

109. See notes 51-62, 181-91 and accompanying text *infra*.

110. Palmer v. Water Co. v. Lehigh Water Co., 280 Pa. 492, 124 A. 747 (1924) (mechanical and manufacturing uses are secondary to domestic uses).

111. Scranton Gas & Water Co. v. Delaware, L. & W. R.R., 240 Pa. 604, 88 A. 24 (1913).

112. Hughesville Water Co. v. Person, 182 Pa. 450, 38 A. 584 (1897); Pennsylvania R.R. v. Miller, 112 Pa. 34, 3 A. 780 (1886); Hollister v. Erie & Wyoming

Public interest has resulted in exceptions to these priority rules. Thus, it has been held that when a municipality with a duty to supply the domestic necessities of its citizens is faced with a calamity, such as a severe water shortage caused by a long drought, public welfare justifies the municipality's taking water for its citizens' domestic use regardless of the existing rights of riparian owners who may be injured thereby.¹¹³ The municipality will remain liable to any riparian owner whose domestic use has been impaired, but impairment of other uses creates no liability¹¹⁴ and, in fact, the municipal water supplier can force riparian owners with vested rights in non-domestic uses to forego their diversion temporarily.¹¹⁵ Nondomestic riparian uses are also subservient to the public right to use navigable waters¹¹⁶ for navigation.¹¹⁷ Certain water supply agencies are unrestricted by this right of navigation,¹¹⁸ but extraordinary riparian wa-

Valley R.R., 11 Luck. 247 (Pa. C.P. 1916). As noted previously, this limitation upon "extraordinary uses" applies equally to a water company that, solely as a riparian owner, diverts water to a nonriparian municipality without the use of eminent domain. Phillipsburg Water Co. v. Citizens Water Co., 189 Pa. 23, 41 A. 979 (1899); Irving's Ex's v. Borough of Media, 10 Pa. Super. 132 (1899), *aff'd*, 194 Pa. 618, 45 A. 482 (1900); Standard Plate Glass Co. v. Butler Water Co., 5 Pa. Super. 563 (1897).

113. Philadelphia v. Collins, 68 Pa. 106 (1871) (dictum); North Mt. Water Supply Co. v. Troxell, 14 Luz. 161 (Pa. C.P. 1908), *aff'd*, 223 Pa. 315, 72 A. 621 (1909).

114. Philadelphia v. Collins, 68 Pa. 106 (1871) (dictum on impairment of navigation).

115. North Mt. Water Supply Co. v. Troxell, 14 Luz. 161 (Pa. C.P. 1908), *aff'd*, 223 Pa. 315, 72 A. 621 (1909) (water company supplying municipality entitled to order requiring riparian owner with prescriptive right to dam watercourse to release water).

116. What constitutes a navigable waterway does not depend solely on its size or its actual use for commercial transportation. Pennsylvania Envir. Council, Inc. v. Bartlett, 315 F. Supp. 218 (M.D. Pa. 1970), *aff'd*, 454 F.2d 613 (3d Cir. 1971); Lakeside Park Co. v. Foresmark, 396 Pa. 389, 153 A.2d 486 (1959). Rather, rivers are regarded as navigable in law if, in fact, commerce, trade, and travel can be conducted thereon. United States v. Utah, 283 U.S. 64 (1931); Cleveland & Pitts. R.R. v. Pittsburgh Coal Co., 317 Pa. 395, 176 A. 7 (1935). See generally R.T. Weston, Public Rights in Pennsylvania Waters, State Water Plan Water Laws & Institutional Arrangements Backed Rep. No. 1, 2-21 (1975) [hereinafter cited as Weston].

Based on these guidelines the following rivers flowing partially or wholly in Pennsylvania have been declared navigable: Allegheny—United States v. Union Bridge Co., 143 F. 377, *aff'd*, 204 U.S. 364 (1907); Wainwright v. McCullough, 63 Pa. 66 (1869); Delaware—McKeen v. Delaware Diversion Canal Co., 49 Pa. 424 (1865); Lehigh—McKeen, *supra*; Monongahela—Grays Landing Ferry Co. v. Stone, 46 F.2d 394 (3d Cir. 1931); Monongahela Bridge Co. v. Kirk, 46 Pa. 112 (1863); Ohio—Ginslet v. Wood, 146 Pa. 370, 23 A. 404 (1892); Schuylkill—Philadelphia v. Philadelphia Suburban Water Co., 109 Pa. 130, 163 A. 297 (1932); Susquehanna—Post v. Wilkes Barre Connecting R.R., 286 Pa. 273, 133 A. 377 (1926). Many other streams in Pennsylvania have been declared "public highways" subject to public navigation rights. Weston, *supra*, at 13-18 and Appendix I.

117. Yoffee v. Pennsylvania Power & Light Co., 385 Pa. 520, 534, 123 A.2d 636, 644 (1956); *Id.* v. Philadelphia, 42 Pa. 219 (1862).

118. Philadelphia v. Philadelphia Suburban Water Co., 309 Pa. 130, 163 A. 297 (1932); Philadelphia v. Gilmartin, 71 Pa. 140 (1872); Philadelphia v. Collins, 68 Pa. 106 (1871); Hunt v. Graham, 15 Pa. Super. 42 (1900); Gallagher v. Philadelphia, 4 Pa. Super. 60 (1897).

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ter users like manufacturing and power plants cannot impair the navigability of a watercourse.¹¹⁹ A nondomestic withdrawal and diversion from a navigable river that impairs navigation gives rise to a public nuisance.¹²⁰

2. *Power Plants' Riparian Rights.*—A power plant sited on riparian land owned by an electric utility is a riparian proprietor. Absent special rights gained through specific grant, prescription, or condemnation, when a power plant diverts water from a watercourse for steam condensation and other operating processes, it acts as a mere riparian owner.

Use of water to produce power is generally classified as an extraordinary use.¹²¹ Although most cases dealing with power production by riparian proprietors involves use of water in gravity flow systems to provide mechanical power for enterprises like grain mills,¹²² water use by a modern thermal-electric power plant,¹²³ through analogy to milling and manufacturing on riparian land, would be similarly termed an extraordinary use.¹²⁴ Because a power plant's water use is an extraordinary one, its consumption is subject to the same limitations imposed on other extraordinary users.¹²⁵ Most important

119. *Philadelphia v. Philadelphia Suburban Water Co.*, 309 Pa. 130, 163 A. 297 (1932); *Gallagher v. Philadelphia*, 4 Pa. Super. 60 (1897).

120. *Philadelphia v. Gilmartin*, 71 Pa. 140 (1872); *Philadelphia v. Collins*, 68 Pa. 106 (1871); *Gallagher v. Philadelphia*, 4 Pa. Super. 60 (1897).

121. See notes 92-95 and accompanying text *supra*.

122. See note 94 *supra*.

123. In modern thermal-electric power plants, nuclear and fossil-fueled, the primary use of water from an outside watercourse is for condensation. These plants generate electricity by producing steam to turn turbines. The water from which the steam is produced is maintained in, and constantly recycled through, a closed system. When the steam has exhausted through the final turbine stage, it must be condensed and cooled before it can be returned to the steam generators. It is at this condensing-cooling stage that water from outside sources, (e.g., a watercourse flowing through the riparian land on which the plant is situated) must be supplied. Although most of the cooling water is returned to its source, substantial amounts are lost through evaporation and, where cooling towers are used, through "misting." Hill, *Thermal Pollution and Its Control*, 2 ENVIR. AFFAIRS 406 (1972). For a general description of a typical nuclear power plant see M. EL-WAKIL, *NUCLEAR POWER ENGINEERING* 16-19 (1962).

124. *Myers & Ervein Co. v. Philadelphia, J. & C. Ry.*, 12 Montg. 46 (Pa. C.P. 1896) (defendant's diversion of water for steam generation and condensing processes in production of electricity held extraordinary use).

125. See notes 72-120 and accompanying text *supra*. This assumes that the power plant is situated on riparian land and that any diversion of water is for use on that land. If the power plant is situated on nonriparian land, it is not a riparian owner and must justify its diversion on some basis other than riparian ownership. As a practical matter, nuclear power plants must be sited on riparian land or adjacent to some body of water that is constantly replenished. ENERGY POLICY STAFF, OR-

among these is that it lawfully can take only that quantity of water that is reasonable in view of the requirements of other riparian owners and does not materially and perceptibly diminish the watercourse's flow.¹²⁶ Although the propriety of a particular extraordinary use might depend on its nature,¹²⁷ the usual determinant of reasonableness¹²⁸ is the quantity of water diverted and the diversion's effect on the watercourse.¹²⁹ A power plant's choosing to supply its water needs by diverting water from a stream instead of other alternatives should have little bearing on the diversion's reasonableness. On the contrary, reasonableness will be determined by considering the stream's size, the amount of diversion, and its effect on other riparians.¹³⁰ What the power plant might have done is a moot question.

Power plant use will be subject, however, to superior rights statutorily granted to municipalities and public water supply agencies.¹³¹ It is similarly limited by conflicting uses that have been procured through prescription.¹³²

3. *Remedies for Power Plant Diversions.*—If a large nuclear power project so diminished a river's flow that downstream domestic, municipal, and industrial users were injured, what recourse would these riparians have?

(a) *Equitable remedies.*—Injunctions and restraining orders are available to lower riparian owners to terminate unlawful diversions and to prevent proposed withdrawals.¹³³ When a power plant without any claim of right diverts water for use away from riparian land or when its unlawful conduct creates a public nuisance or clearly

FICHE OF SCIENCE & TECHNOLOGY, CONSIDERATIONS AFFECTING STEAM POWER PLANT SITE SELECTION 22 (1968).

126. See notes 98-102 and accompanying text *supra*. See also *Myers & Ervein Co. v. Philadelphia, J. & C. Ry.*, 12 Montg. 46 (Pa. C.P. 1896).

127. See, e.g., *Hughesville Water Co. v. Peison*, 182 Pa. 450, 38 A. 584 (1897) (court indicated that it would enjoin any diversion that gave no benefit to the diverting riparian owner); *Filbert v. Dechert*, 22 Pa. Super. 362 (1903) (diversion of water to operate a fountain on the grounds of a state insane asylum was not a reasonable or necessary use).

128. See notes 103-05 and accompanying text *supra*.

129. In *Wilkes-Barre Water Co. v. Lehigh Coal & Nav. Co.*, 14 Luz. 319 (Pa. C.P. 1885), the court equated unreasonableness with perceptible diminution in a watercourse's flow that injuriously affects a lower riparian's enjoyment. In *Hough v. Doylestown Borough*, 4 Brewst. 333 (C.P. Bucks 1870), the court stated that the extraordinary purpose for which water is taken is immaterial. The question is whether the water diversion reduces the volume of the stream to the prejudice of lower owners' rights. See notes 103-05 *supra*.

130. *Clark v. Pennsylvania R.R.*, 145 Pa. 436, 22 A. 989 (1891). But see RESTATEMENT (SECOND) OF TORTS § 850B (Tent. Draft No. 17, 1971) (practicality of avoiding the harm by adjusting the use, method of use, or quantity of water used by each riparian proprietor is a factor in assessing reasonableness).

131. See notes 163-72 and accompanying text *infra*.

132. See notes 150-62 and accompanying text *infra*.

133. *Rider v. York Haven Water & Power Co.*, 743 P. 2d 844 (Pa. 1987).

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injured by the plant's diversion. In *Dinnick v. City of New London*,¹³⁹ a municipality had constructed a dam and diverted one-half of a river's water to supply its inhabitants during an extended drought. When the drought ended, the city maintained its diversion, removed restrictions on water use by its inhabitants, approved sixty new residential users, and agreed to supply daily a substantial quantity of water to a nuclear power plant. Since the city used its riparian rights rather than eminent domain to obtain the additional flow during the drought and thereafter,¹⁴⁰ a group of lower riparians sought to enjoin the continuation of its increased diversion. The Connecticut Supreme Court held that because defendant's diversion was for a beneficial public use, it would not be enjoined even though the emergency had long since passed. The injured riparian owners, unable to prove substantial injuries from the city's actions, were awarded only nominal damages.

The usefulness of power plants in combating the ongoing energy shortage may induce courts to take a *Dinnick* approach in dealing with unlawful diversions by power plants when mere riparian owners seek to enjoin their consumptive use. Nevertheless, *Dinnick* took an artificially restricted view of the equitable remedies available to lower riparians and courts. Shutting down a power plant if its diversion unlawfully injures other riparians is not the only alternative. The offending utility could construct new water facilities or participate in financing projects to develop water in the basin. Additionally, installation of backup reservoir capacity or adoption of a schedule of diversions may remove a utility's need to divert stream waters during low flow conditions when interference with other riparians is most likely to occur. Similarly, the utility could arrange to provide alternative water supplies from other streams or ground sources to affected lower riparians. These alternatives, of course, can be very expensive. If a utility does not voluntarily adopt one of these approaches, it is uncertain whether it can be forced to do so as a condition of continued operations.¹⁴¹ Although regulatory agencies in some instances have imposed such conditions,¹⁴² the

139. 157 Conn. 9, 215 A.2d 569 (1968).

140. Connecticut riparian law, for the most part, is identical to that of Pennsylvania. A riparian owner is entitled to the natural flow of a watercourse, undiminished in quantity and unimpaired in quality, and can recover actual or at least nominal damages for any wrongful diversion or unreasonable use. *Id.*

141. It is not entirely clear that a power plant's diversion of water to a reservoir on nonpayment for use in low flow periods based on its riparian rights alone is lawful. While ultimately the water will be pumped back and used at the power plant on riparian land, there is initially a diversion away from the riparian land. A question, which apparently has not yet been addressed by the courts, is whether the diversion is unlawful under the riparian doctrine's proscription of diversions for "use" on nonriparian land. See notes 103-05 and accompanying text *supra*.

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injures a lower riparian owner with only small attendant benefit to the utility, the equities strongly favor the plaintiff and the court can grant an injunction without considering available remedies at law.¹³⁸ In all water diversion cases an important equitable consideration is that if left unrestrained, a power plant's unlawful diversion can ripen into a prescriptive right. The prescriptive period runs from the commencement of the diversion even though the absence of intervening low flow protects lower riparians from significant injury. If the injunctive remedy is denied, the only means of barring acquisition of prescriptive rights by the power plant would be a multiplicity of lawsuits for nominal damages. To prevent this, an equity court will enjoin wrongful diversions even without proof of injury by the lower riparian owners.¹³⁹ A proposed diversion will not be restrained, however, on the speculative apprehension of lower riparian owners that they will be injured.¹⁴⁰ Equitable principles of balancing the equities and laches apply and will result in denial of an injunction if, for example, a lower riparian owner sits on his rights while a utility erects complex and expensive facilities for a diversion and use of water that may result in legal injury to the plaintiff.¹⁴¹

A power plant's performance of an essential public service¹⁴² can make an injunction difficult to obtain for riparian owners legally

138. See *Markleton Hotel Co. v. Connellyville S.L. Ry.*, 242 Pa. 569, 89 A. 703 (1914); *Borough of Tyrone v. Stevens*, 178 Pa. 543, 36 A. 166 (1897); *Beck v. Kuder*, 15 Pa. Super. 89 (1900).

139. *Giffiths v. Monongahela R.R.*, 232 Pa. 639, 81 A. 713 (1911).

140. *Hev v. Springfield Water Co.*, 207 Pa. 38, 56 A. 265 (1903); *Harley v. Mechanic Water Co.*, 174 Pa. 416, 34 A. 568 (1896).

141. *Appeal of Pennsylvania R.R.*, 125 Pa. 189, 17 A. 478 (1889); *Powers v. Bald Eagle Boom Co.*, 125 Pa. 175, 17 A. 254 (1889); *Hollman v. Union Canal Co.*, 37 Pa. 100, 104 (1860); *Lukens v. Alan Wood Iron & Steel Co.*, 19 Mont. 78 (Pa. C.P. 1903). Note, however, that an equity action is not barred by laches where the reason for the delay was the plaintiff's difficulty, despite diligent efforts, in ascertaining the identity of the party who caused the diversion. *Synons v. Gubbie*, 58 Pa. D. & C. 2d 76 (C.P. Mercer 1968).

142. There are no appellate cases that deal with the diversion and consumptive use of water, based on riparian rights alone, by a power plant for the purpose of producing electric power, but such use is analogous to diversions by railroad or water supply companies taking water without the aid of eminent domain powers or special statutory grants. In each case the taker is a public utility company performing a public service for profit, the use is classified as extraordinary, and the taker is constrained by the reasonable use and material domination concepts. Since in these situations both railroad and water supply companies have been held liable to lower riparian owners when the use materially diminished watercourse flow, caused actual damages, or interfered with lower riparian uses, see, e.g., *Rider v. York Haven Water & Power Co.*, 242 Pa. 141, 88 A. 903 (1913); *Clark v. Pennsylvania R.R.*, 145 Pa. 28, 22 A. 989 (1891). Similar results can be expected for corresponding effects caused by power plants generating electricity.

courts have not. Judicial reluctance notwithstanding, as important water uses come into conflict and demands for municipal, industrial, irrigation, and power uses exceed available supply, more creative use of equitable remedies will become imperative.

(b) *Legal remedies*.—When a power plant unlawfully diverts or consumes water, lower riparian owners are entitled to recover any actual and special damages sustained.¹⁴³ The measure of damages depends on whether the power plant interferes with an existing or a prospective riparian right and whether the interference is temporary or permanent.

If an unlawful diversion deprives lower riparian owners of existing water uses and forces them to acquire water from other sources to continue their activities, the measure of damages is the expense of replacing the water lost.¹⁴⁴ Alternatively, if the plant's consumption amounts to a permanent, material diminution in the volume of the watercourse, lower riparian owners can recover the depreciation in value of their property—the difference between the land's value before and after the unlawful diversion.¹⁴⁵ A continuous, unlawful diversion deemed temporary in nature will be considered a continuing trespass giving rise to successive causes of action.¹⁴⁶ To assure that the injured party recovers the full extent of his damages, suit must be timely commenced.¹⁴⁷

143. See *Craig v. Borough of Shippensburg*, 7 Pa. Super. 526 (1898); *Standard Plate Glass Co. v. Butler Water Co.*, 5 Pa. Super. 563 (1897).

144. *Tring's Ex'rs v. Borough of Mechu*, 10 Pa. Super. 143 (1899), *aff'd*, 194 Pa. 648, 45 A. 482 (1900) (mill owner entitled to amount expended to replace quantity of flow diverted by defendant); *Standard Plate Glass Co. v. Butler Water Co.*, 5 Pa. Super. 563 (1897) (glass manufacturer who used large amounts of water in its process permitted to recover expense of resupply made necessary by defendant's diversion).

145. *Wagner v. Purity Water Co.*, 241 Pa. 328, 88 A. 482 (1913); *Williams v. Folmer*, 131 Pa. 405, 25 A. 103 (1892); *Dielon v. Borough of New Holland*, 126 Pa. Super. 315, 191 A. 393 (1937).

146. *Wagner v. Purity Water Co.*, 241 Pa. 328, 88 A. 484 (1913); *Lentz v. Carnegie Bros. & Co.*, 145 Pa. 612, 23 A. 219 (1892); *Standard Plate Glass Co. v. Butler Water Co.*, 5 Pa. Super. 563 (1897).

147. A riparian owner who has been legally injured by unlawful diversions may unwittingly limit the damages recoverable by his failure to bring suit promptly. This is best illustrated by *Lentz v. Carnegie Bros. & Co.*, 145 Pa. 612, 23 A. 219 (1892). In that case a riparian owner sued for damages to his farmland caused by defendant's damming of a watercourse. Since defendant had conducted its activities for nearly seventeen years, it contended that the statute of limitations precluded plaintiff's suit. Although the court rejected this contention, it held that the Act of March 22, 1713, 1 Sta. L. 76, § 1 (recapitulated at Pa. STAT. ANN. tit. 12, § 31 (1953)) imposed a six-year statute of limitations on this action in trespass, because a continuing trespass was involved, plaintiff could recover for the damage due to his lands in the six years

A cause of action exists even when a power plant's diversion neither causes actual damage nor deprives the lower riparians of specific uses. While no actual damage has been inflicted, lower owners are entitled to nominal damages¹⁴⁸ because the diverting party has committed a legal wrong that can ripen into a prescriptive right if damages are not allowed.¹⁴⁹

B. Prescriptive Rights

The second method of obtaining water rights under the common law is by prescription. In general, the right to use a quantity of water in any watercourse other than a navigable stream¹⁵⁰ can be acquired by an open, notorious, and continuous use in a manner ad-

verse suit. *Accord*, *Kraft v. Hauser & McSherrydown Water Co.*, 242 Pa. 114, 88 A. 939 (1913); *Roeder v. Shophill Haven Gas & Water Co.*, 15 Sch. 325 (Pa. C.P. 1919). But since defendant had operated in the same manner for nearly seven years, the condition of plaintiff's land was the same at the time of suit as it had been six years earlier and as a result he recovered nothing. While plaintiff was able to prevent defendant from obtaining a prescriptive right, his delay in bringing suit prevented the recovery of any actual or consequential damages caused by defendant's clearly unlawful act.

A similar result can accrue in inverse condemnation cases. Under Pa. STAT. ANN. tit. 26, § 1-324 (Supp. 1975), any private party whose property has been injured but not condemned by a party that has the powers of eminent domain can file a petition for appointment of a jury to assess damages within six years of the date of the injury. A failure to file within six years results in a loss of the right to be compensated for the injury. The applicability of this statute of limitations to power plants depends upon whether the plant possesses power to condemn water. See notes 181-91 and accompanying text *infra*.

148. *Clark v. Pennsylvania R.R.*, 145 Pa. 438, 22 A. 989 (1891); *Miller v. Miller*, 9 Pa. 74 (1848).

149. *Clark v. Pennsylvania R.R.*, 145 Pa. 438, 22 A. 989 (1891). An important point regarding riparian rights should be noted. The lower riparian has the power to protect both existing and future (inclosure) rights. Interference with water uses may not be readily apparent, as when a power plant commences its diversion in times of relatively high flow. The prospective interference is, nevertheless, cognizable. It is hydrologically predictable. The loss is subject to evaluation, either in terms of the cost of acquiring alternative water supplies or the diminution of the value of impacted riparian land. Even when a power plant's diversion permanently interferes only with inclosure prospective uses, the market value of the riparian land will reflect the preclusion of those future uses. A key problem arises in this regard; there is no evidence that the market value of land directly reflects the loss or gain of water rights, especially interference with prospective uses. Many factors, such as urban land needs, inflation, transportation availability, and taxes affect land values, and the positive stimulus of some of these factors may mask the negative impact of water use interferences. The market may not reflect the value of prospective water uses precluded by a power plant's diversion until those future uses become more predictable current needs, that is, until those who need the water are willing to bid for it. Failure to perceive future scarcity and potentials for water conflict has resulted in little development of a water rights market, making evaluation of damages from loss of water highly speculative and probably economically inaccurate.

150. A right to a use that interferes with navigation in a navigable watercourse cannot be acquired by prescription. *Bind v. Smith*, 8 Watts 414 (Pa. 1839), because property held for a public purpose cannot be acquired by adverse possession. See A.D. Graham & Co. v. Pennsylvania Tyle Co., 347 Pa. 622, 33 A.2d 22

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however, to the amount of water taken continuously during the entire statutory period.¹⁵⁵ For example, in *Lancaster Milling Co. v. Media Heights Golf Club*,¹⁵⁶ the court held that the proprietor of a golf course, who for over twenty-one years had used water from a stream to irrigate greens, could not exercise a prescriptive right to divert additional quantities to irrigate fairways. The prescriptive right also might be restricted to the particular use engaged in during the twenty-one year period, at least when a party seeks to engage in a use radically different from the one through which it gained a prescriptive right. However, no definitive holdings address this point.¹⁵⁷

Once obtained, a prescriptive right can be asserted against a power plant's consumptive, interfering use. Because prescriptive rights are absolute, as contrasted with the impermanent and corrective nature of riparian rights, they can be asserted with more assurance that an effective remedy will be granted to the injured party. Thus, a mill owner or manufacturer with a prescriptive right to a daily quantity of water can restrain an upstream power plant operating as a mere riparian owner from interference with his prescriptive use.¹⁵⁸ In turn, a power plant acting as a mere riparian owner cannot enjoin an upstream owner whose impoundment or diversion of water under a prescriptive right interferes with the power plant's use.¹⁵⁹

Prescriptive rights to the use of water, therefore, hold a stronger position against a power plant's consumptive use than riparian rights. A power plant, like any other water user, however, can gain a prescriptive right by uninterrupted use for twenty-one years.¹⁶⁰ Moreover, prescriptive rights gained by older power plants apply to new plants built on the same site as long as increased quantities of water are not taken.¹⁶¹ Prescriptive rights held by power

verse to the rights of others¹⁶² for a period of twenty-one years.¹⁶³ Under certain circumstances similar rights can be obtained by public service entities possessing eminent domain powers unless inverse condemnation actions are commenced within six years of a taking.¹⁶⁴

Prescriptive rights differ markedly from riparian rights in that they are absolute and exclusive and not constrained by considerations of reasonableness or requirements of use on riparian land. Thus, a person who diverts water to nonriparian land or who in the process of extraordinary riparian manufacturing enterprise substantially diminishes a stream's flow can acquire a prescriptive right by open, notorious, and continuous use of the water in a manner inconsistent with the legal rights of upstream and downstream riparians.

A party can acquire through prescription absolute ownership of all the water of a watercourse.¹⁶⁵ The prescriptive right is limited,

151. *Loughran v. Maplewood*, 367 Pa. 593, 81 A.2d 879 (1951); *Horn v. Miller*, 142 Pa. 557, 21 A. 994 (1891). To support a defensive claim of prescriptive rights, the acts that are the basis of the claim must be injurious to the plaintiff and give to him or those under whom he claims a right of action. *Hughesville Water Co. v. Person*, 182 Pa. 450, 454, 38 A. 584, 585 (1893). Under Pennsylvania law, however, a lower riparian gains a right of action for at least nominal damages when a defendant engaged in an extraordinary use materially diminishes the stream flow or diverts water to nonriparian land, even if the plaintiff is making no use of the water that could be injured. See *Clark v. Pennsylvania R.R.*, 145 Pa. 438, 450, 22 A. 989, 990 (1891). "Any trespass or nuisance which infringes upon the rights of the plaintiff, or which would abridge his present or potential use of his property, will justify an action, although it causes no present actual damage . . ." *Id.* (emphasis added). Still, to gain a prescriptive right the "aggrieved" riparian owner must have notice of the adverse use. The statute runs from the time when the owner is or with proper attention to his own property should be warned of the adverse claim. *Hughesville Water Co. v. Person*, *supra* at 434, 38 A. at 585. In *Hughesville* defendants operated factories along a stream and for over twenty-one years had made open, continuous, nightly diversions. The court held that since plaintiffs, lower riparian owners, made no use of the water during the nighttime, defendants' nightly diversions were not reasonably discoverable by plaintiffs and, therefore, no prescriptive right could be gained through this continuous use.

152. Pa. Stat. Ann. tit. 52, § 72 (1933); see *Shaffer v. Baylor's Lake Ass'n*, 392 Pa. 493, 141 A.2d 583 (1958); *Palmer Water Co. v. Lehigh Valley Water Co.*, 280 Pa. 492, 121 A. 717 (1924); *McGeorge v. Hoffman*, 133 Pa. 381, 19 A. 413 (1890); *Appeal of Messinger*, 109 Pa. 285, 4 A. 162 (1885); *Gelbman v. Enghman*, 105 Pa. 371 (1884); *Irving's Ex's v. Borough of Media*, 10 Pa. Super. 132 (1899), *aff'd*, 194 Pa. 646, 45 A. 482 (1900); *Lancaster Milling Co. v. Media Heights Golf Club*, 59 Pa. Super. 159 (Pa. C.P. 1964). The period begins to run at the instant an unlawful diversion occurs. *Appeal of Messinger*, 109 Pa. 285, 4 A. 162 (1885).

153. Pa. Stat. Ann. tit. 26, § 1-324 (Supp. 1975); *O'Keefe v. Allsonia City Auth.*, 9 Pa. Commonwealth Ct. 397, 304 A.2d 916 (1973). Early eminent domain codes contained no statute of limitations on inverse condemnation actions and consequently public entities could acquire no prescriptive rights. See *Franklin v. Philadelphia*, N.A.N.R.R. 286 Pa. 331, 133 A. 563 (1926).

154. *Consolidated Water Supply Co. v. State Hosp. for Criminal Insane*, 66 Pa. Super. 610 (1917).

155. *Swanton Gas & Water Co. v. Delaware, L. & W.R.R.*, 240 Pa. 604, 88 A. 24 (1913); *Irving's Ex's v. Borough of Media*, 10 Pa. Super. 132 (1899), *aff'd*, 194 Pa. 646, 45 A. 482 (1900).

156. 59 Pa. Super. 159 (Pa. C.P. 1964).
157. In *Swanton Gas & Water Co. v. Delaware, L. & W.R.R.*, 240 Pa. 604, 88 A. 24 (1913), the court ruled that the railroad company's prescriptive right to divert a large quantity of water for use on riparian land could not be construed as a prescriptive right to divert water to a reservoir on distant, nonriparian land. While the case can be read as a prohibition against application of water to a use different from that for which a prescriptive right exists, the railroad's attempt to divert larger quantities to the reservoir than it previously had used on riparian land under its prescriptive right casts some doubt on this interpretation.

158. *C.F. Irving's Ex's v. Borough of Media*, 10 Pa. Super. 132 (1899), *aff'd*, 194 Pa. 646, 45 A. 482 (1900).

159. *C.F. Appeal of Messinger*, 109 Pa. 285, 4 A. 162 (1885) (defendant's damaging of stream under prescriptive right not expungeable by downstream mill owner).

160. Provided, of course, that the plant does not possess eminent domain powers over water rights. See note 153 and accompanying text *supra*, notes 181-91 and accompanying text *infra*.

161. In *Lukens v. Alan Wood Iron & Steel Co.*, 19 Mont. 76 (Pa. C.P. 1903),

plants give them a virtually unassailable right to the consumptive use of water.¹⁶²

C. Rights of Public Water Companies Holding State Permits

1. *Acquisition of Rights.*—The acquisition of water and water rights for public supply generally is governed by statute in Pennsylvania. Enabling acts permit cities and boroughs to acquire the water of springs, creeks, streams, and rivers to supply their citizens and confer the power of eminent domain for that purpose.¹⁶³ Municipal acquisitions are restricted in that they cannot deprive riparian and spring owners of water for domestic, dairy, stock watering, and farming uses.¹⁶⁴ All acquisitions of water and water rights by public water supply agencies, a term that encompasses all corporations vested with power to supply water to the public¹⁶⁵ including private, municipal, and quasi-municipal corporations, districts, and authorities, currently are governed by the Pennsylvania Water Rights Act,¹⁶⁶ at least with respect to water rights acquired after the Act's effective date.¹⁶⁷

Under the Water Rights Act no public water supply agency can acquire water rights, including the right to increased quantities, by purchase, gift, lease, prescription, or condemnation without first pro-

During six months of the year the diversion used nearly the entire stream flow and in months of greater flow it took a substantial portion. When defendant subsequently built a steel mill on riparian land and diverted the same quantity to a reservoir for use in steel processing and steam production, a lower riparian mill owner sought an injunction. The court refused to enjoin diversion for the new use, however, because no greater quantity was taken than during the prior thirty-year period. The court also affirmed defendant's expenditure of large sums of money in erecting the steel plant and the inequity of allowing plaintiff to restrain the new use and diversion.

162. *Id.*

163. PA. STAT. ANN. tit. 53, § 2905 (1974); *id.* § 38505 (1957).

164. PA. STAT. ANN. tit. 53, § 2905 (1974); *id.* § 38505 (1957).

165. PA. STAT. ANN. tit. 32, § 631(b) (1967).

166. *Id.* §§ 631-41. Originally the Act of April 29, 1874, P.L. 73, No. 32 (compiled at PA. STAT. ANN. tit. 15, § 3241 (1967)), gave public water supply agencies incorporated in the Commonwealth eminent domain power to appropriate all water required for their present and future needs in supplying the public. This act was subsequently repealed by the Act of July 20, 1968, P.L. 459, No. 216 (compiled at PA. STAT. ANN. tit. 15, § 2204(c)(2) (Supp. 1975)), insofar as it was inconsistent with PA. STAT. ANN. tit. 15, § 1322 (Supp. 1975). The latter statute provides that a public utility corporation with the principal purpose of supplying water to the public shall have the power of eminent domain to condemn water, provided that such corporation procures a water supply permit required by the Water Rights Act, *id.* tit. 32, § 631-41 (1967). Therefore, all public water supply corporations must obtain a water supply permit before exercising the power of eminent domain and, once this permit is obtained, must exercise that power within the limits of the permit.

167. Act of June 24, 1939, P.L. 842, No. 365, § 5 (compiled at PA. STAT. ANN. tit. 32, § 635 (1967)).

curing a water supply permit.¹⁶⁸ In reviewing permit applications the Department of Environmental Resources (DER)¹⁶⁹ must ascertain whether a proposed water use will conflict with the rights of any other public water supply agency and must determine (1) that the proposed diversion is reasonably necessary for current and future needs and (2) that the taking of this water will not interfere with navigation, jeopardize public safety, or cause substantial injury to the Commonwealth.¹⁷⁰ Once a public water supply agency receives a permit, it has the power to condemn all necessary water rights by eminent domain.¹⁷¹ A right to a hearing is provided to anyone who may be directly or adversely affected by any DER action under the Act.¹⁷²

2. *Rights of Downstream Water Supply Agency.*—The rights of a downstream water supply agency whose supply is affected by an upstream power plant depend upon the manner in which the agency acquired its water rights. The mere incorporation of a water company and conferral of eminent domain powers does not give the corporation the right to appropriate and divert water without condemnation; it has only the rights of a riparian owner.¹⁷³ It can seek to

168. PA. STAT. ANN. tit. 32, §§ 635-36 (1967).

169. In accordance with § 1908-A of the Administrative Code, the Department of Environmental Resources assumed the powers and duties formerly vested in the Water Supply Commission and Water and Power Resources Board with respect to the condemnation or appropriation of waters, applications for new or additional sources of water supply, and construction of water works. *Id.* tit. 71, §§ 510-8(1)(d)-(f) (Supp. 1975).

170. *Id.* tit. 32, § 637 (1967); see *Borough of Collegeville v. Philadelphia Suburban Water Co.*, 377 Pa. 636, 105 A.2d 722 (1954), construing PA. STAT. ANN. tit. 32, §§ 636-37 (1967).

171. PA. STAT. ANN. tit. 32, § 639 (1967). Prior to the passage of the Water Rights Act, acquisition of water and water rights by water supply agencies was governed by *id.* §§ 621-25 and the public utility supplements to the Corporation Act of 1874, *id.* tit. 15, §§ 3241-56.

172. PA. STAT. ANN. tit. 32, § 640 (1967); *id.* tit. 71, § 510-21 (Supp. 1975) (hearing powers conferred on Environmental Hearing Board).

173. *Phillipsburg Water Co. v. Citizens Water Co.*, 189 Pa. 23, 41 A. 979 (1899); *Lord v. Meadville Water Co.*, 135 Pa. 122, 19 A. 1007 (1890); *Appeal of Haupt*, 125 Pa. 211, 17 A. 436 (1889). Thus, if a water supply agency diverts water away from its riparian land to the community it serves, it has acted illegally as a riparian owner and is liable to other riparian owners injured thereby. *Lord v. Meadville Water Co.*, *supra*; *Irving's Ex's v. Borough of Media*, 10 Pa. Super. 132 (1899), *aff'd*, 194 Pa. 648, 45 A. 482 (1900); *Craig v. Borough of Shippensburg*, 7 Pa. Super. 526 (1898); *Standard Plate Glass Co. v. Butler Water Co.*, 5 Pa. Super. 563 (1897). A municipality that diverts water for supply purposes under statutes permitting it to do so is required to compensate riparian owners for the rights of which they have been deprived. *Appeal of Haupt*, 125 Pa. 211, 17 A. 436 (1889); *Craig v. Borough of Shippensburg*, 7 Pa. Super. 526 (1898). But when a public calamity, such as a long drought, requires the taking, the courts will bow to the public interest and permit a public water supply company to use the waters of a watercourse on an emergency basis despite injury to riparian owners and even though the water company never acquired such rights through condemnation, prescription, or grant. *North Mt. Water Supply Co. v. Troxell*, 14 Luz. 161 (Pa. C.P. 1908), *aff'd*, 232 Pa. 315, 72 A. 621 (1909).

restrain power plant diversions that unreasonably affect its supply or materially diminish watercourse flow within the limits of riparian doctrine, but it has no absolute right to a specific quantity or supply of water. On the other hand, when a public water supply agency acts pursuant to its power of eminent domain and in accordance with governing statutes,¹⁷⁴ its powers are broad.¹⁷⁵ The statutory power to appropriate water imposes a duty on a water company to supply the maximum demands of its subscribers under all conditions including drought and minimum flow periods.¹⁷⁶ Consequently, public water supply agencies and the courts can be expected to protect public supplies and sources jealously from threatening consumptive uses by others.

The question of what action can be taken to protect previously acquired public water supplies endangered by an electric power plant's consumptive use has not been addressed by Pennsylvania courts. The situation is analogous, however, to one in which a manufacturer, railroad company, or some other commercial enterprise on a riparian land attempts to divert and consume water in a manner that interferes with public water supply. The courts' willingness to vindicate the rights of downstream public water supply agencies threatened by consumptive diversions of upstream extraordinary uses is illustrated by *Appeal of Haupt*.¹⁷⁷ A private water company had contracted to supply water to private users and proceeded to install pipes and pumping apparatus. A downstream public water

agency established to supply a municipality previously had acquired through condemnation the right to as much water as necessary for that purpose. The public agency sued the private company to enjoin completion of the diversion works, alleging that the diversion would interfere with plaintiff's water supply, particularly in times of low flow. The court granted the injunction, ruling that public water supply was given a special status by the legislature, was of greater relative importance than commercial uses, and must be protected when the public supplier acquired its rights pursuant to statute and not as a mere riparian owner. Under this reasoning injunctions have been granted to restrain similar diversions by railroad companies to supply their engines.¹⁷⁸ Uses by electric utilities that interfere with public water supplies will be similarly restrained.

3. *Taking of Water by Downstream Power Plant.*—When an electric power plant is located downstream from a public water supply agency, a question whether the plant is entitled to an adequate supply for its needs arises. In general, an extraordinary user cannot force a public water supply agency to release water for the lower owner's use. In *Palmer Water Co. v. Lehighton Water Supply Co.*,¹⁷⁹ a private water firm was incorporated for the sole purpose of supplying water to a zinc manufacturer. The zinc concern later installed new processes and its requirements increased. Its private supplier was unable to meet the new demand from available flow and, in turn, brought an equity action against a nearby public water utility to force release of a constant amount of water from its upstream reservoirs. Defendant water utility, which served municipal consumers, had acquired through eminent domain the right to divert a substantial portion of the watershed's available flow. The court held that the private water firm was not entitled to an injunction, emphasizing that a public water utility has an important obligation and that the use of water for manufacturing and mechanical purposes is always secondary to the public's domestic and health needs.

While a power plant downstream from a public water utility can divert water for its extraordinary use, it must do so within the confines of riparian law if it takes as a mere riparian owner. Since diversion by a water supply agency may reduce significantly the quantity reaching the power plant, the plant might be further limited in the amount it can divert because any substantial diversion by the plant will more easily cause a material diminution in the flow of the already partially depleted watercourse. Moreover, the flow reaching the power plant is subject to further diminution since an up-

174. See notes 163-72 *supra*.

175. In *Reeves v. Philadelphia Suburban Water Co.*, 287 Pa. 376, 135 A. 362 (1926), the supreme court stated,

The supply of pure water to the public in territory thickly populated is today a most difficult problem and its difficulties are bound to multiply as time goes on and population increases. Whatever may have been this court's position . . . in previous decades, when its great importance may not have been fully realized, the tendency, as our decisions in the evolution will show, has been to broaden the view and to construe liberally grants of power to water companies, furnishing, as they do, the most essential of all public services to mankind, vital to life itself.

Id. at 382, 135 A. at 364. In this same vein, public water supply agencies generally are given power to condemn all water they reasonably deem necessary for their present and future needs. *Philadelphia v. Philadelphia Suburban Water Co.*, 309 Pa. 130, 163 A. 297 (1933); *Palmer Water Co. v. Lehighton Water Supply Co.*, 280 Pa. 492, 124 A. 747 (1924); *Boasburg Water Co. v. State College Water Co.*, 240 Pa. 198, 87 A. 609 (1913). A water supply agency can appropriate an entire stream if necessary, *Palmer Water Co. v. Lehighton Water Supply Co.*, *supra*, and can store, carry away, and sell water in accordance with the needs of its subscribers, *Reeves v. Philadelphia Suburban Water Co.*, *supra*.

176. *Palmer Water Co. v. Lehighton Water Supply Co.*, 280 Pa. 492, 124 A. 747 (1924).

177. 125 Pa. 211, 17 A3436 (1889).

178. *Wilkes-Barre Water Co. v. Lehigh Coal & Nav. Co.*, 14 Luz. 319 (Pa. C.P. 1885).

179. 280 Pa. 492, 124 A. 747 (1924).

stream public water supply agency can condemn additional quantities of water as its needs require.¹⁸⁰

D. Condemnation by Thermal Electric Power Plants

Several legislative enactments purport to confer power on utilities to appropriate water for electricity production by means other than hydroelectric generation.¹⁸¹ Under close analysis, however, this authorization is completely ineffective. Section 322(A) of the Pennsylvania Business Corporation Law provides that any public utility corporation shall have the right to take and condemn "property" for "[t]he production, generation, manufacture, transmission, storage, distribution or furnishing of . . . electricity . . . to or for the public."¹⁸² On the other hand, subsection (F) of the same section¹⁸³ states that the powers granted by the statute are not to be construed to permit a public utility to condemn waters or water rights without first having obtained a limited power permit¹⁸⁴ authorizing the acquisition. The statute that purportedly enables electric utilities to appropriate water for thermal-electric power generation is the Limited Power Act.¹⁸⁵ Any public service company holding a limited power permit granted on behalf of a power project¹⁸⁶ for use

180. For example, in *Philadelphia & Reading R.R. v. Pottsville Water Co.*, 182 Pa. 418, 38 A. 404 (1897), the court refused to restrain the condemnation of water by a public water supply agency and held that the downstream railroad that sought the injunction had no right of action against the public water company and that its water rights were subject to appropriation for public water supply.

181. These statutes concentrate on the use of water for thermal electric power generation by nuclear or fossil fueled plants as opposed to hydroelectric power generation. *E.g.*, Pa. Stat. Ann. tit. 15, § 1322(A)(3) (Supp. 1975).

182. *Id.* Although the statute refers to the power to condemn "property," as opposed to a specific power to condemn water and water rights, the language implies that water is included in the term "property" and that "property" is used merely as a general term to describe land, water, water rights, easements, rights of way and the myriad of other "property" the acquisition of which would be appropriate for public utility purposes. The conclusion that water and water rights are included is supported by subsection (F) of the statute, which specifically refers to water, water rights, and condemnation powers and limits the exercise of those powers. *Id.* § 1322(F).

183. Pa. Stat. Ann. tit. 15, § 1322(F) (Supp. 1975).

184. Limited power permits are granted pursuant to *id.* tit. 32, §§ 591-600, 621-625 (1967). For a discussion of limited power permits in the context of overall state regulation of water resources, see notes 192-212 and accompanying text *infra*.

185. Pa. Stat. Ann. tit. 32, §§ 591-600 (1967).

186. A power project is defined as a complete unit of improvement or development for the procuring and/or supplying of light, heat, or power by electricity and includes the various structures, facilities, appurtenances, transmission systems, and the like that are necessary and appropriate in the construction, maintenance, and operation of the unit. *Id.* § 621.

in public service has the right to appropriate and condemn waters¹⁸⁷ and other property and rights if DER¹⁸⁸ finds the region's and the Commonwealth's interests served by the project's operation.

These two statutes notwithstanding, the requirement of first obtaining a limited power permit renders the statutory grants of eminent domain powers nugatory. An anomaly in the Limited Power Act allows permits only for nonnavigable streams,¹⁸⁹ which are with few exceptions insufficient to support a major electric generating facility. For practical purposes, therefore, electric utilities are precluded from acquiring eminent domain powers to condemn water necessary for generating electricity by thermal-electric means under either section 322 of the Business Corporation Law or the Limited Power Act. Moreover, no statute enables the Pennsylvania Public Utility Commission to confer water acquisition powers on utilities for use in operation of thermal-electric plants. The Public Utility Code prohibits a utility's use of eminent domain until it obtains a certificate of public convenience from the Commission.¹⁹⁰ The power of eminent domain over water, however, is conferred through other statutes, all of which refer to the Limited Power Act.¹⁹¹

Thus, no means currently exist by which a thermal-electric generating facility can acquire the power to condemn water from navigable rivers for use in normal operating processes. Absent that power utilities must satisfy their needs by purchase or by taking as a riparian owner.

IV. Regulatory Approaches to Consumptive Uses

During the past fifty years a network of state, regional, and federal regulatory programs have gained primacy over common law mechanisms in governing the water field. The ability of these programs to deal effectively and comprehensively with the challenge of power plant water use must be examined carefully. Whether these regulatory laws can avoid potential water conflicts and expeditiously resolve those that do arise is of paramount concern.

A. State Regulatory Programs

In 1971 the Pennsylvania Department of Environmental Resources assumed the powers formerly vested in the Water Supply

187. *Id.* § 621.

188. By reason of section 1905-A of the Administrative Code, DER assumed these powers and duties that were formerly vested in the Water Supply Commission and the Water and Power Resources Board. *Id.* tit. 71, § 510.8 (Supp. 1975).

189. See notes 198-212 and accompanying text *infra* for a detailed discussion of the problems of the Limited Power and Water Supply Act and reasons for its ineffectiveness.

190. Pa. Stat. Ann. tit. 66, § 1124 (Supp. 1975). This requirement does not apply to electric cooperatives. *Id.* tit. 15, § 12432 (1967).

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Commission and the Water and Power Resources Board to regulate construction of dams and other water obstructions, condemnation and appropriation of waters, and applications for new or additional supplies of water and water power.¹⁹² Through this transfer DER administers the 1913 Water Obstructions Act,¹⁹³ the 1923 Limited Power Act,¹⁹⁴ and the 1939 Water Rights Act.¹⁹⁵

Under the Limited Power Act any person who uses a dam or changes the course, current, or cross section of any stream or body of water for the "development of water power" or for "the main purpose of storing, cooling, diverting, [or] generating . . . water for steam raising or steam condensation . . . in the generation of electric energy for use in public service" must obtain a limited power permit.¹⁹⁶ This includes both hydroelectric and thermal-electric plants.

By its terms the Limited Power Act is the exclusive method of obtaining state permits for power projects. Except as provided in the fourth paragraph of section 2, the Act supersedes the Water Obstructions Act¹⁹⁷ with respect to changes in streams and diversions of water for power purposes. The peculiar construction of section 2,¹⁹⁸ however, creates an anomaly in its application to thermal-electric plants. That section distinguishes between changes in streams to develop power¹⁹⁹ within the jurisdiction of the United States and those that are not within the jurisdiction of the United States. A power dam or a stream change to develop power is deemed to be within the first category under the following circumstances: (1) the stream change or dam is constructed in or upon navigable waters of the United States; or (2) the Federal Power Commission (FPC) finds that interstate or foreign commerce would be affected by a dam or stream change.²⁰⁰ DER is empowered to issue permits for power

plant water use for up to fifty years subject to conditions that the Department deems

necessary to protect the present and future interests of the Commonwealth and its people in the construction, maintenance, and operation of the project, and in the water and power resources to be utilized thereby, and suitable to secure to the permittee a reasonable opportunity for a fair return on the actual investment prudently made in the project.²⁰¹

Unfortunately, the 1923 Limited Power Act created a statutory *non sequitur* as applied to power projects within the jurisdiction of the United States. The Act attempted to tie the Commonwealth's issuance of a permit to receipt of a FPC license authorizing the proposed water diversion.²⁰² The difficulty is that the FPC has no jurisdiction to regulate diversion and consumptive water use for thermal-electric power generation. The United States Supreme Court recently affirmed²⁰³ the Commission's long-standing position²⁰⁴ that its jurisdiction under the Federal Power Act²⁰⁵ is limited to hydroelectric and not thermal electric power production. The inequity²⁰⁶ between the Pennsylvania Limited Power Act and the Federal Power Act imposed impossible conditions upon projects to supply

navigable in fact. And they are navigable in fact when they are used, or are susceptible of being used, in their ordinary condition, as highways for commerce, over which trade and travel are or may be conducted in the customary modes of trade and travel on water. And they constitute navigable waters of the United States within the meaning of the acts of Congress, in contradistinction from the navigable waters of the States, when they form in their ordinary condition by themselves, or by uniting with other waters, a continuous highway over which commerce is or may be carried on with other States or foreign countries in the customary modes in which such commerce is conducted by water.

See *United States v. Oregon*, 295 U.S. 1, 15 (1935); *United States v. Utah*, 783 U.S. 61, 76 (1931); *United States v. Holt State Bank*, 270 U.S. 49, 55 (1926); *Brewer v. Flood Out & Gas Co. v. United States*, 260 U.S. 77, 86 (1922); *United States v. Rio Grande Dam & Irrigation Co.*, 174 U.S. 690, 698 (1899).

The federal courts have embellished and expanded the basic test over the past century. To date the most fully developed and expansive statement of the federal test of navigability is contained in *United States v. Appalachian Elec. Power Co.*, 344 U.S. 377 (1940). As explained by the Supreme Court, the test does not depend on the ability of a river in its natural (unimproved) condition to support commercial navigation. If a river can be made navigable by "reasonable improvements," it is deemed a part of the navigable waters of the United States. For a fuller discussion of these definitions see Quinn, *An Analysis of Navigable Waters of the United States*, 18 *DAYTON L. REV.* 559 (1966); Leighty, *The Source and Scope of Public and Private Rights in Navigable Waters*, 5 *LAMB & WATER L. REV.* 391 (1970); Weston, *supra* note 116.

Pa. Stat. Ann. tit. 32, § 592 (V 5) (1967).

202. *Id.* § 592 (V 3).

203. *Chenuehuet Tribe of Indians v. FPC*, 420 U.S. 393 (1975). For a more detailed discussion of this case and the issue of FPC jurisdiction, see notes 339-42 *infra*.

204. "[T]he Commission is limited to the consideration of projects designed to produce water power." *FPC Ann. Rep.* 31-52 (1923) (emphasis added).

205. 16 U.S.C. § 797(c) (1970).

206. Letter from Robert E. Woodside, Attorney General of Pennsylvania, to S.S.

192. *Pa. Stat. Ann.* tit. 71, § 140 B (Supp. 1975).

193. *Id.* tit. 32, § 681-91 (1967).

194. *Id.* § 591-600.

195. *Id.* § 631-41.

196. *Id.* § 592, 594.

197. *Id.* § 681-91.

198. *Id.* § 592.

199. This term includes both hydroelectric dams and thermal-electric diversions.

Id. tit. 32, § 591 (1967) (definitions).

200. *Id.* tit. 32, § 592 (1967). The term "navigable waters of the United States" is a term of political art developed in a series of cases defining the extent of the federal government's power to regulate navigations and commerce. One of the earliest and most generally accepted legal definitions of navigable waters of the United States was contained in *The Daniel Ball*, 77 U.S. (10 Wall.) 557, 563 (1871) (emphasis added).

Those rivers must be regarded as public navigable rivers in law which are

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water for steam (thermal-electric) power on streams "within the jurisdiction of the United States."²⁰⁷ Because the Federal Power Act does not require and the FPC does not issue permits for thermal-electric plants, the requirement that a limited power permit for a steam power project within the jurisdiction of the United States shall become "null and void" unless the permittee obtains a federal permit within one year²⁰⁸ created an anomaly in the law.²⁰⁹

To eliminate this ambiguity the general assembly amended section 2 of the Limited Power Act in 1953 to add the following paragraph:

The provisions of this act relating to dams or changes in streams to supply water for steam power within the jurisdiction of the United States shall be suspended and postponed until the Federal Power Commission shall require licenses for such dams or changes in streams; and during the period in which the provisions of this act shall be so suspended and postponed, any such dams or changes in streams shall continue to be subject to existing laws relating to water obstructions.²¹⁰

The "existing laws relating to water obstructions" consist primarily of the Water Obstructions Act.²¹¹ Thus, to the extent a thermal-electric project involves a diversion from navigable waters of the United States, it is subject to the regulatory provisions of the Water Obstructions Act and not those of the Limited Power Act.²¹²

The 1913 Water Obstructions Act²¹³ empowers DER to regulate the construction of dams and other water obstructions, together with activities that "in any manner . . . change or diminish the course, current or cross section of any stream."²¹⁴ A thermal elec-

²⁰⁷ Since the FPC lacks regulatory authority over thermal-electric power projects and, thus, will not engage in findings that these projects affect interstate or foreign commerce, for the purposes of § 2 of the Limited Power Act we need only be concerned with thermal-electric projects that involve the diversion and use of navigable waters of the United States. *See* Pa. STAT. ANN. tit. 32, § 592 (B) (1967).

²⁰⁸ *Id.* § 592 (B) 1.

²⁰⁹ DER General Counsel's Opinion, "Control Over Consumptive Uses of Water in Power Projects," memo from R.T. Weston to W.E. Gilberthorn at 28 (May 1975).

²¹⁰ Pa. STAT. ANN. tit. 32, § 592 (B) 4) (1967).

²¹¹ *Id.* § 681-91.

²¹² It was the consistent administrative practice of the Water and Power Resources Board after the effective date of the Limited Power Act to issue permits for dams to supply water for steam power under the Water Obstructions Act. Thus, the 1953 amendment to § 2 of the Limited Power Act affirmed and statutorily authorized prior administrative practice with respect to steam power projects. *See* Woodside Letter, *supra* note 206, at 1.

²¹³ Pa. STAT. ANN. tit. 32, §§ 681-91 (1967).

²¹⁴ *Id.* § 682.

tric project can come under the permit provisions of the Act in two ways. First, it will usually involve "construction of a dam or other water obstruction" in or along a stream at the point of diversion. Second, diversion of large quantities of water for steam generation and cooling purposes will substantially "change or diminish" the current and cross section of the stream or body of water involved.²¹⁵

Although DER and its predecessor, the Water and Power Resources Board, have issued many permits for thermal-electric diversions under the Water Obstructions Act, no regulations specifically addressing the consumptive water use issue have been promulgated.²¹⁶ For a number of years, however, the agency applied a "guideline"²¹⁷ in evaluating permit applications for dams and diversions. The guideline required the minimum release of .15 cubic feet per second for every square mile of drainage area above the diversion.²¹⁸ In 1974 a task force for the State Water Plan prepared more sophisticated criteria to guide planning and regulation of low flows and to protect water quality and stream regimes.²¹⁹ The criteria have not been adopted in regulatory form, but are used in assessment of future water availability and new permit requests.²²⁰

Persons aggrieved by permit decisions of DER, including affected riparian owners,²²¹ can appeal to the Environmental Hearing

²¹⁵ The significance of the change upon the current and cross section of streams caused by consumptive water use in thermal-electric projects was emphasized by the court in *Chenoweth Tribe of Indians v. FPC*, 489 F.2d 1207 (D.C. Cir. 1973). The United States Court of Appeals for the District of Columbia Circuit specifically noted that cooling water requirements of thermal-electric plants are projected to increase from 120 billion gallons per day in 1971 (equivalent to ten percent of the average daily runoff of the United States) to 600 billion gallons per day in the year 2000 or fifty percent of the average daily runoff. However, only a fraction of this amount will be consumed by evaporation in the cooling process.

The Water Obstructions Act does not apply to "tidal waters of the Delaware River and of its navigable tributaries." Pa. STAT. ANN. tit. 32, § 682 (1967). Since the Delaware River and its navigable tributaries are clearly navigable waters of the United States, *Rundell v. Delaware & Raritan Canal Co.*, 55 U.S. 314 (How.) 80 (1852); *Black v. American Ingot Corp.*, 264 Pa. 260, 107 A. 737 (1919), thermal-electric projects diverting and utilizing these waters are not covered by § 2 of the Limited Power Act, Pa. STAT. ANN. tit. 32, § 592 (1967). Nor would this diversion for thermal-electric plants be covered by the Water Obstructions Act. Thus, DER has no authority to regulate the diversion of water from tidal portions of the Delaware River or of its navigable tributaries for use in fossil-fueled or nuclear-fired power plants.

²¹⁶ The regulations governing Water Obstructions Act matters are contained in 25 Pa. Code §§ 103.1-158.

²¹⁷ For an explanation of the legal distinction between regulations and guidelines see *Commonwealth v. Hornum Coal Co.*, 452 Pa. 77, 97, 306 A.2d 308, 319 (1973); *Swatley v. County of Bucks*, Dep't of Health, Pa. Env. Hearing Bd., DCL No. 73-267-B (July 24, 1974).

²¹⁸ For example, if a dam drained a watershed of 200 square miles, the minimum low flow release would be 30 cubic feet per second.

²¹⁹ Pa. Planning Policy Committee, *supra* note 13, at 50-52.

²²⁰ The issue of whether low flow criteria should be incorporated in regulations and the potential impact of alternative criteria are currently under study as part of the Pennsylvania State Water Plan's water law analysis effort.

²²¹ *See* Pa. STAT. ANN. tit. 32, § 682 (1967).

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Board²²² and commonwealth court²²³ in accordance with the Administrative Agency Law.²²⁴ Hearing board adjudications follow a full administrative hearing of record and a decision by independent board members based on evidence produced.²²⁵ Appeals from these adjudications are limited in scope and must allege constitutional or statutory violations, arbitrary, capricious, and unreasonable action, failure to support determinations by substantial evidence, or manifest abuse of discretion.²²⁶

The best protection for water users who may be affected by proposed power plant diversions is early and active intervention in administrative processes. Long before DER issues or denies a permit, notice of application is published in the *Pennsylvania Bulletin*. Concerned party input to the framing of permit review and the development of appropriate terms and conditions often can avoid protracted litigation in which the burden is on the challenging party. If, however, aggrieved persons do not intervene or bring an appeal within thirty days after notice of permit issuance, all rights to challenge the permit will be cut off.²²⁷

B. Interstate Compact Commission Program

Pennsylvania is signatory to two river basin compacts²²⁸ that established a comprehensive planning and regulatory regime for water resources. These compacts, approved by Congress²²⁹ and the member states,²³⁰ created the Delaware River Basin Commission

(DRBC) and the Susquehanna River Basin Commission (SRBC) as separate regulatory entities,²³¹ providing for a "joint exercise" of the sovereign rights of the signatory parties "in the common interests of the people of the region."²³² Both DRBC and SRBC are directed to prepare and adopt comprehensive plans "for the immediate and long range development and uses of water resources" in their basins.²³³ The commissions are empowered to allocate water among their signatory states,²³⁴ but the allocation does not constitute a prior appropriation of waters nor does it confer any superiority of right to use the waters.²³⁵

The compacts confer two powers on the commissions in regulating surface water withdrawals and uses: to review and approve certain projects and to regulate withdrawals within certain protected areas and under emergency conditions. Projects that have a "substantial effect" on basic water resources must be reviewed and approved by DRBC and SRBC.²³⁶ Projects can be approved by DRBC only if it finds that the proposal as submitted or modified will not "substantially impair or conflict with the comprehensive plan."²³⁷ SRBC approval requires a determination that a proposal "is not detrimental to the proper conservation, development, management, or control of the water basin" and is consistent with the comprehensive plan.²³⁸ Both commissions are empowered to adopt regulations governing submission, review, and consideration of project proposals.²³⁹

DRBC and SRBC have implemented the project review provisions with administrative regulations. Along the Delaware signifi-

DEL. CONSERVATION LAW § 24.0701 to 0723 (McKinney 1973); Pa. Stat. Ann. tit. 32, § 815.101 (1967). Legislation ratifying the SRBC Compact includes Minn. Res. Comm. Act No. 8, 301 (1974); N.Y. Environmental Conservation Law § 24.1101 to 1121 (McKinney 1973); Pa. Stat. Ann. tit. 32, §§ 820.1-8 (Supp. 1975).

231. DRBC Compact § 2.1; SRBC Compact § 2.1.

232. DRBC Compact § 1.3(b); SRBC Compact § 1.3(2).

233. DRBC Compact § 3.2; SRBC Compact § 3.3.

234. DRBC Compact § 3.3 (such allocations to be "in accordance with the doctrine of equitable apportionment"); SRBC Compact § 3.2.

235. DRBC Compact § 3.3(b); SRBC Compact § 3.3(c). This language is meant to limit the effectiveness of any commission allocations to the duration of the compact. While the compact is in effect, SRBC or DRBC allocation confers on the party a right to use the water to provided. This right is not permanent, however. Unlike a right of prior appropriation or an apportionment by the United States Supreme Court, it may terminate at the expiration of the basin compact.

236. DRBC Compact § 3.8; SRBC Compact § 3.10. The SRBC Compact requires approval for any project (i) on or crossing the boundary of member states; (ii) involving diversion of water; (iii) having a significant effect on water resources in another state; or (iv) that has been included in the comprehensive plan or would significantly affect the plan. *Id.*

237. DRBC Compact § 3.8.

238. SRBC Compact § 3.10(4).

239. DRBC Compact § 3.6; SRBC Compact § 3.6.

A 24.408, 475 (1975) (citizens owning riparian land downstream of proposed sewer interception have standing to challenge grant of Clean Streams Law permit).

222. Pa. Stat. Ann. tit. 71, § 510.21 (Supp. 1975).

223. *Id.* tit. 71, § 211.14, 211.403.

224. *Id.* tit. 71, § 1710.1-31 (1962).

225. See *Warren Sand & Gravel Co. v. Commonwealth*, 20 Pa. Commonwealth Ct. 186, 341 A.2d 556 (1975).

226. Pa. Stat. Ann. tit. 71, § 1710.44 (1962); *Belin v. DER*, 5 Pa. Commonwealth Ct. 677, 291 A.2d 553 (1972); *A.P. Weaver & Sons v. Sanitary Water Bd.*, 3 Pa. Commonwealth Ct. 499, 281 A.2d 515 (1971).

227. 25 Pa. Code § 21.21(a) (repealed in 4 Pa. Bull. 2281 (1974)); *Borough of Grove City v. Commonwealth*, Pa. Env. Hearing Bd., Del. No. 74.267 C (April 10, 1975); see *De Francis v. Commonwealth*, Unemployment Comp. Bd. of Review, 17 Pa. Commonwealth Ct. 514, 313 A.2d 202 (1975).

228. Delaware River Basin Compact, Pa. Stat. Ann. tit. 32, § 815.101 (1967) (hereinafter cited as DRBC Compact); Susquehanna River Basin Compact, *Id.* § 820.1-8 (Supp. 1975) (hereinafter cited as SRBC Compact).

229. DRBC Compact was approved by Act of Sept. 27, 1961, Pub. L. No. 87-228, 75 Stat. 688; SRBC Compact by Act of Dec. 24, 1970, Pub. L. No. 91-575, 84 Stat. 1309.

230. The legislation ratifying the DRBC Compact includes Del. Code Ann. tit. 7, §§ 6501-11 (1975); N.J. Stat. Ann. §§ 32:11D.1 to 11D.10 (1963); N.Y. Environ-

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Both DRBC and MCD rules provide for review and comment on project applications by concerned agencies of the signatory states as well as commission staff review.²⁵⁰ In the past several years both commissions have adopted principles to guide approval of proposed electric power project water uses. The Susquehanna body has incorporated a policy into its comprehensive plan requiring "compensation . . . for consumptive uses during periods of low flow."²⁵¹ Precise criteria defining the "trigger" low flow are now under study. Both the mean annual and ten-year low flows are being considered.²⁵² Whichever trigger is selected, the policy will require either termination of consumptive water uses in power projects during low flows, construction of backup storage facilities, or purchase of adequate flow releases from federal, state, or SRBC reservoirs to offset fully any consumptive withdrawals.²⁵³

Although not yet incorporated in regulatory form, the same policy has been followed by the Delaware Commission in reviewing several power project applications. Most notable is the recent DRBC decision on Philadelphia Electric Company's Limerick Nuclear Generating Station.²⁵⁴ After extended hearings by both the Delaware Commission and the Nuclear Regulatory Commission,²⁵⁵ DRBC set minimum flow criteria for the Schuylkill and Delaware Rivers and Perkasie Creek and limited withdrawals from these sources by Philadelphia Electric to periods when designated minimum flows are exceeded.²⁵⁶ DRBC imposed a "river follower" op-

250. 18 C.F.R. §§ 401.37, 39, 403.5, 403.25 (1975).

251. SRBC, Comprehensive Plan for Management and Development of the Water Resources of the Susquehanna River Basin 55 (1973) [hereinafter cited as SRBC Comprehensive Plan].

252. Conversation between R.T. Weston and P. Carucci, Esq., Assistant to the Executive Director of SRBC, December 9, 1975. The SRBC Comprehensive Plan additionally establishes minimum low flows for the Susquehanna entering Chesapeake Bay. The twenty-year low flow to the Chesapeake cannot be reduced in the months of August, September, and October. "The flows of 3,500 cfs, 3,050 cfs and 2,870 cfs into Conowingo Reservoir during August, September and October respectively are selected as surrogates for low flow into the Bay at the mouth of the Susquehanna River during those months." SRBC Comprehensive Plan, *supra* note 251, at 55.

253. Under the Susquehanna Compact the Commission can construct water supply projects or buy storage capacity in federal, state, or private reservoirs and contract with entities desiring to purchase a portion of the developed water. SRBC Compact §§ 3.9, 4.1-5. Similar powers are conferred on the Delaware River Basin Commission. DRBC Compact §§ 3.7, 4.1-5; see DRBC Resolution 71-4, in DRBC Water Management, *supra* note 13, at A.6 to 9.

254. DRBC Dkt. No. D-69-210 CP (Final) (Nov. 5, 1975). For further background regarding this project see notes 47-51 and accompanying text *supra*, notes 307-22 and accompanying text *infra*.

255. See notes 307-22 and accompanying text *infra*.

256. Withdrawals for consumptive uses are allowed from the Schuylkill River, which adjoins the Limerick Plant, when upstream flows exceed 530 CFS (342 MGD) with one reactor unit in operation, or 560 CFS (362 MGD) with two units in operation. This "trigger" criteria is substantially in excess of both the seven-day, ten-year and seven-day, two-year low flows. Diversions from Perkasie Creek, which involve an interbasin transfer to the Schuylkill, would be prohibited when flows

cant projects are defined to include surface water diversions in excess of a daily average gross withdrawal of 100,000 gallons in any calendar month.²⁶⁰ DRBC requires review applications for electricity generation projects with a design capacity of 100,000 kilowatts (KW) or more²⁶¹ to be accompanied by an environmental impact statement²⁶² prepared pursuant to the National Environmental Policy Act.²⁶³ In addition, each power plant application must contain a "master siting study" and "site selection analysis for the project."²⁶⁴ A master siting study describes in general terms all existing power projects and all projects planned or proposed for the ensuing fifteen-year period, together with the impact of each project upon the water and related land resources of the basin.²⁶⁵ The site selection analysis must demonstrate the "relationship of the proposed project, and its specific location, to the master siting study."²⁶⁶

SRBC rules provide similar project review requirements for activities that have the potential to alter the physical, biological, chemical, or hydrologic characteristics of interstate waters.²⁶⁷ Projects that require commitment of water for longer than ten years must be approved by the Commission, although withdrawals of less than one MGD that in conjunction with other diversions do not exceed twenty-five percent of the seven-day, twenty-year low flow are exempted.²⁶⁸ Virtually all power plant proposals must gain commission approval. SRBC does not mandate that a master siting study accompany each application. Instead, the Commission has required the several power utilities active in the basin to prepare and submit at least annually a joint master study covering the following fifteen-year period.²⁶⁹ The contents of the annual study are almost identical to DRBC specifications.

260. 18 C.F.R. §§ 401.32, 401.35-2 (1975).

261. *Id.* § 401.35-2.

262. *Id.* §§ 401.37(a), 401.51-67.

263. 42 U.S.C.A. §§ 4321-47 (1973).

264. 18 C.F.R. § 401.37(a) (1975).

265. *Id.* § 401.37(b). The study must

include, with as much detail as is available, a description of the five-mile reach of any stream within which each proposed project is or will be located, the concept, capacity and fuel source of each project, the quantity and method of heat and moisture dissipation, the water resource requirements and water-related ecological effects of each proposed project in the study.

266. *Id.* § 401.37(c).

267. *Id.* § 803.3(a)(4).

268. *Id.* § 803.3(a)(5).

269. SRBC Resolution 73-15 (Sept. 12, 1973).

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erational scheme upon the Linerick plant: whenever the identified flow constraints prevent plant operation at full load, Philadelphia Electric can "operate the plant only at such percentages of full load as the available water supply allows, as determined by the Delaware River Basin Commission from time to time."²⁵⁷ In addition, DRBC imposed a special condition upon approval of the Linerick plant:

Prior to January 1, 1977, the Commission will, in its sole discretion, determine the adequacy of the then existing storage facilities on the Delaware River or its tributaries together with additional storage to be built to supply all needs (including the applicant's) for water supply from that source by the year 1981. If the Commission then determines that the storage will not be adequate for all projected needs of the Basin, the applicant will build or cause to be built, at its own expense, at a location approved by the Commission, for service in 1981, a reservoir of sufficient storage capacity to assure the water supply needed for consumptive use by the Linerick plant, during periods when such use would reduce the flow in the Delaware River at the Trenton gauge below 3,000 cfs. Storage and release of water in such facility will be under the Commission's regulation, at the expense of the applicant.²⁵⁸

Thus, DRBC has reserved an option to require the power company to build backup storage if other reservoirs in the basin are determined inadequate to meet all present and projected water needs.²⁵⁹

dropped below 180 CFS (116 MGD) with one unit operating or 210 CFS (136 MGD) with two units operating. The goal for the Perkasie is maintenance of a long term no less than flow of 150 CFS at Gratiot gauge. Delaware River waters can be transferred to the Perkasie only when flows measured at Trenton exceed 3,000 CFS, a level set to prevent saltwater intrusion in the lower Delaware and to protect Philadelphia's water supply. DRBC Dkt. No. D-69-210 CP (Preliminary Decision, March 29, 1973), at 5.6.

257. DRBC Dkt. No. D-69-210 CP (Final) (Nov. 5, 1975), at 15.

258. *Id.*

259. This reservation was stimulated by the uncertain status of several proposed Delaware basin reservoir projects, including the controversial Tocks Island Dam. Following DRBC rejection of the Tocks project on July 31, 1975, the Commission undertook a broad reexamination of the basic water supply elements of its Comprehensive Plan, including base flow criteria, drought frequency planning assumptions, and priorities accorded competing uses. *Id.* at 13. Until the results of these studies are received, the Commission elected to impose a river flowlower regime on the Linerick plant's water use. Opponents of the Linerick project challenged the validity of the river flowlower scheme in a parallel appeal of the Nuclear Regulatory Commission's plan of a construction license for Linerick. The Environmental Coalition on Nuclear Power argued that the most viable option (and probable outcome) would be valve construction of a backup reservoir by Philadelphia Electric and that the power plant should not be approved prior to preparation of an environmental impact statement showing that this reservoir was environmentally possible. The Third Circuit rejected this challenge in a memorandum opinion issued one week after the final DRBC docket decision. *Environmental Coalition on Nuclear Power v. NRC*, No. 75-1421 (3d Cir., Nov. 12, 1975).

In addition to project review authority, both DRBC and SRBC are empowered to "regulate and control withdrawals and diversions from surface waters" within designated protected areas or under emergency conditions.²⁶⁰ After public hearings the commissions can declare as "protected areas" portions of the basins in which demands "have developed or threaten to develop to such a degree as to create a water shortage or to impair or conflict with the requirements or eff-ctuation of the comprehensive plan."²⁶¹ In any designated protected area water withdrawals for domestic, municipal, agricultural, or industrial uses in excess of quantities set forth in commission rules are prohibited unless the withdrawals are made pursuant to a commission permit or a state permit issued prior to the effective date of the basin compact.²⁶²

In the event of drought or other conditions that may cause immediate water shortage, DRBC and SRBC can declare a water supply emergency in all or part of their basins.²⁶³ Under the DRBC compact, for the duration of an emergency no person can divert or withdraw water without a special permit from the Commission.²⁶⁴ The SRBC emergency powers do not provide specifically for a special permit system, but allow that Commission to "direct increases or decreases in any allocations, diversions, or releases previously granted or required, for a limited time to meet the emergency condition."²⁶⁵ The standards for issuing a permit or modifying an allocation, diversion, or release are identical in both compacts. The commissions are directed

to avoid such depletion of the natural stream flows and ground waters in the protected area or in an emergency area as will adversely affect the comprehensive plan or the just and equitable interests and rights of other lawful users of the same source, providing due regard to the need to balance and reconcile alternative and conflicting uses in the event of an actual or threatened shortage of water of the quality required.²⁶⁶

Both the protected area and emergency powers overlay state common and statutory law relating to water use. Indeed, whenever the commissions find it necessary or desirable to exercise these powers, state issued permits for water diversion or withdrawal can be superseded "to the extent of any conflict with the control and regulation" exercised by DRBC or SRBC.²⁶⁷

260. DRBC Compact §§ 10.1-8; SRBC Compact §§ 11.1-8.

261. DRBC Compact § 10.2; SRBC Compact § 11.2.

262. DRBC Compact § 10.3; SRBC Compact § 11.3.

263. DRBC Compact § 10.4; SRBC Compact § 11.4.

264. DRBC Compact § 10.4.

265. SRBC Compact § 11.4(a).

266. DRBC Compact § 10.5; SRBC Compact § 11.5.

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To date, neither body has invoked its permit authority pursuant to the protected area provisions. In the 1960's, however, the Delaware Commission confronted severe drought conditions and was forced to implement an emergency diversion control program.²⁶⁸ The Commission authorized most withdrawals and diversions to continue without special permit,²⁶⁹ but imposed an emergency limit on New York City's use²⁷⁰ and a regime to control releases from some major reservoirs.²⁷¹ The emergency was terminated in March 1967.²⁷²

The project review provisions give the basin commissions control over new power plants that contemplate significant consumptive water uses. Emergency and protected area powers, which cover both new and existing uses, allow direct intervention in water management during low flow periods when conflicts are most likely to arise. The commission process also provides concerned water users who may be adversely affected by power project water consumption with a forum for raising and resolving conflicting water needs. DRBC²⁷³ and SRBC²⁷⁴ rules provide for public hearings on certain project applications. DRBC regulations authorize a full adjudicatory hearing procedure whenever "substantial opposition" is filed to a project.²⁷⁵ This hearing is limited, however, to issues raised in written objections, which must specify the grounds for opposition.²⁷⁶ SRBC rules allow the Commission in its discretion to hold either a formal adjudicatory hearing or a less formal, "legislative-style"

public hearing when evaluating major projects.²⁷⁷ Hearings of both commissions provide for administrative decision-making based on the compiled record. Decisions by either commission in executing project review, protected area, or emergency powers are subject to "judicial review in any court of competent jurisdiction."²⁷⁸ The federal statutes ratifying the compacts confer original jurisdiction over all appeals of commission actions upon the United States district courts.²⁷⁹

Although the compact commissions can provide an expert forum for avoiding or resolving water use conflicts, their effectiveness in managing power plant consumptive water withdrawals has not been demonstrated. Only two basins are covered; the critical Monongahela-Allegheny Ohio watershed, Potomac basin, and Lake Erie areas are not subject to equivalent regulatory structures. Moreover, the adequacy of current "comprehensive plans" in identifying minimum flow standards and assuring adequate water for all users has been seriously questioned.²⁸⁰ In the absence of definitive standards and criteria, ad hoc determination of these complex water resource issues in the context of each power plant application is unlikely to provide viable, long-term solutions.

C. Federal Controls

In addition to regulatory controls imposed on consumptive water uses by state and river basin agencies, federal regulations and regulatory agencies become concerned when water is to be diverted and consumed for certain purposes. Since this article's emphasis has been on consumptive uses related to thermal-electric power generation, the structure and policies of the Nuclear Regulatory Commission (NRC) and other federal agencies principally involved in regulation of electric power generation and energy development will be examined in an attempt to outline available redress for those who have been or may be injured by consumptive uses.

268. DRBC Emergency Resolution No. 1, Res. 65-13 (July 7, 1965).

269. DRBC Conservation Order No. 1, Res. 65-15 (July 7, 1965).

270. DRBC Emergency Resolution No. 2, Res. 65-14 (July 7, 1965); DRBC Resolution 65-16 (July 28, 1965); DRBC Resolution 65-17 (August 6, 1965); DRBC Emergency Resolution No. 5, Res. 65-19 (August 18, 1965); DRBC Emergency Resolution No. 6, Res. 65-25 (October 7, 1965); DRBC Emergency Resolution No. 7, Res. 65-26 (Nov. 24, 1965); DRBC Emergency Resolution No. 8, Res. 65-28 (Dec. 29, 1965); DRBC Emergency Resolution No. 9, Res. 66-4 (March 23, 1966); DRBC Emergency Resolution No. 10, Res. 66-5 (March 23, 1966); DRBC Emergency Resolution No. 11, Res. 66-12 (Aug. 24, 1966); DRBC Emergency Resolution No. 12, Res. 66-17 (Nov. 28, 1966).

271. DRBC Conservation Order No. 1, Res. 65-15 (July 7, 1965); DRBC Conservation Order No. 2, Res. 65-18 (August 6, 1965).

272. DRBC Emergency Resolution No. 13, Res. 67-3 (March 2, 1967). For a detailed analysis of the background and resolution of the Delaware Basin drought see R. Huganir, *The Delaware River Drought Emergency*, Inter-University Case Program #107 (1976).

273. 18 C.F.R. §§ 401.81-87 (1975).

274. *Id.* §§ 803.40-51.

275. *Id.* § 401.42; see *In re Philadelphia Electric Co., Limerick Nuclear Generating Station*, DRBC Dkt. No. D-69-210 CP (Final) (Nov. 5, 1975).

276. 18 C.F.R. § 401.43 (1975).

277. *Id.* §§ 803.42, 803.45.

278. DRBC Compact §§ 3.8, 10.6; SRBC Compact §§ 3.10(6), 11.6 (must be brought within ninety days). Special provisions in both compacts allow signatory states to invoke the original jurisdiction of the United States Supreme Court to review particular commission determinations. DRBC Compact § 1.2(c) (approval of out-of-basin diversions or compensating releases); SRBC Compact § 3.10(7) (approval of project reducing flow below proper minimum).

279. Act of Sept. 27, 1961, Pub. L. No. 87-728, 75 Stat. 688 (reservations to DRBC Compact); Act of Dec. 24, 1970, Pub. L. No. 91-575, 84 Stat. 1509 (reservation to SRBC Compact).

280. Although the challenge in *Environmental Coalition on Nuclear Power v. NRC*, No. 75-1421 (3d Cir., Nov. 12, 1975), was unsuccessful, the need for reevaluating current comprehensive plans was underscored in DRBC's final Limerick decision.

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1. *Nuclear Regulatory Commission.*—Prior to 1975 exclusive and primary responsibility for licensing and regulating construction and operation of commercial, nuclear fueled electric generating facilities in the United States was vested in the Atomic Energy Commission (AEC).²⁸¹ Although the AEC was abolished in 1975,²⁸² its regulatory functions, powers, duties, and rules were transferred intact to the NRC.²⁸³ With respect to regulation of commercial nuclear power, therefore, the only visible change has been in the agency name. AEC policies and regulations, as well as judicial interpretations thereof, are applicable in discussing NRC control of this field.

Under the Atomic Energy Act of 1954²⁸⁴ the NRC administrative process regulates commercial nuclear power plants in two stages—issuance of construction permits and operating licenses. Before an electric utility can begin construction of a generating facility, it must apply for and receive a construction permit.²⁸⁵ Intensive NRC involvement begins upon receipt of the construction permit application and continues at various levels for the entire useful life of the nuclear facility.

(a) *Consideration of water use by NRC.*—Prior to 1971 the AEC contended that under the Atomic Energy Act it was only authorized to consider the radiological effects of the proposed facility in deciding whether a construction permit or an operating license should be granted. The Commission refused to consider potential environmental effects. *New Hampshire v. AEC*²⁸⁶ upheld this position against the State of New Hampshire's attempt to force consideration of potential thermal pollution in the agency's review of a construction permit application.

The AEC allegedly modified its stance when the National Environmental Policy Act (NEPA)²⁸⁷ became law in 1970. This

change supposedly was reflected in updated regulations²⁸⁸ designed to bring the AEC into compliance with NEPA. As the landmark case of *Calvert Cliffs' Coordinating Committee, Inc. v. AEC*²⁸⁹ demonstrated, however, the new regulations failed dismally in accomplishing their objective. The court of appeals noted that NEPA has two facets—the substantive policy set out in section 101²⁹⁰ and the procedural mandates of section 102.²⁹¹ The substantive aspect, whereby NEPA directs that to the fullest extent possible federal agencies are to give appropriate consideration to environmental impact, is flexible and allows a limited exercise of discretion by an agency.²⁹² In contrast, the procedural requirements of section 102 are not discretionary and must be strictly adhered to at every significant, nonduplicative decision-making stage of a project unless compliance clearly would conflict with the agency's statutory authority.²⁹³ These requirements include preparation of environmental impact statements identifying environmental problems and project alternatives, balancing environmental, technical, and economic effects of the agency decision, and considering alternatives that would affect the balance. The overall goal is selecting the optimum course and mitigating environmental harm.

After the *Calvert Cliffs* decision the AEC again amended its regulations to bring them into compliance with NEPA. The new regulations mandate that an impact statement must be prepared, circulated, and reviewed prior to the issuance of a construction permit

and benefits of the federal action. The vehicle through which the environmental effects are identified, analyzed, and evaluated and in which alternatives are raised and the cost/benefit analysis performed is the environmental impact statement prepared by the agency primarily responsible for the federal action to be taken. See generally F. AMERSON, *NEPA IN THE COURTS* (1973).

288. 10 C.F.R. § 50, App. D. (1971). These revised regulations clearly evidenced the Commission's reluctance to depart from its pre-NEPA position that it need give little consideration to environmental factors. For example, the agency regulations provided that (1) the AEC's NEPA impact statement need not be independently considered or factored into the decision making process at the construction permit or operating license application hearings unless environmental issues were affirmatively raised by outside parties or AEC staff; (2) the agency hearing board was prohibited from conducting an independent evaluation and balancing of environmental factors if other agencies agreed that their own environmental standards would be satisfied under the proposed action; (3) nonradiological issues were not to be raised in any AEC hearing for which notice had been published in the *Federal Register* prior to March 4, 1971; and (4) a review of environmental factors was not to be conducted, at least prior to the time of final licensing hearings, for facilities already under construction on the effective date of NEPA.

289. 449 F.2d 1109 (D.C. Cir. 1971). For a detailed analysis of the *Calvert Cliffs* case and its implications with respect to AEC administrative procedures and policies see Comment, *Calvert Cliffs' Coordinating Committee v. AEC: The AEC Learns the True Meaning of the National Environmental Policy Act of 1969*, 3 ENVTL. 316 (1973).

290. 42 U.S.C. § 4331 (1970).

291. *Id.* § 4332.

292. 449 F.2d at 1114-15.

293. *Id.*

281. 42 U.S.C. §§ 2201-10 (1970).

282. Act of Oct. 11, 1974, Pub. L. No. 93-438, tit. I, § 104, 88 Stat. 1237 (effective Jan. 19, 1975 by Exec. Order No. 11,834, 40 Fed. Reg. 2971 (1975)).

283. 42 U.S.C.A. §§ 5841(f), 5871(b) (Supp. 1975).

284. 42 U.S.C. §§ 2011-96 (1970).

285. *Id.* § 2131.

286. 406 F.2d 170 (1st Cir.), cert. denied, 395 U.S. 962 (1969).

287. 42 U.S.C. §§ 4331-35 (1970). This article does not seek to provide an in-depth exposition of the provisions, requirements, and policy of NEPA. Briefly, the Act requires that all federal agencies consider the potential environmental effects of agency actions and decisions and that environmental considerations be given weight equal to other factors that influence an agency decision. NEPA explicitly requires that federal agencies examine the environmental effects and consequences of their actions and the like effects of viable alternatives and balance the environmental costs

for a nuclear power reactor²⁹⁴ and also before the issuance of a full power or design capacity license to operate a power reactor.²⁹⁵ In addition, impact statements must be prepared for any other action that the Commission determines will have a significant effect on the quality of the human environment.²⁹⁶

The revised NRC regulations do not, and possibly could not, list all the environmental considerations that must be addressed in an appropriate impact statement. Nevertheless, little doubt exists that one importance of water supply—both to the neighboring public and the facility itself—requires careful consideration of power plant consumptive water use in the agency's permit and licensing process.²⁹⁷

The Linerick nuclear generating facility provided NRC with an opportunity to explore the water supply impact of its licensing decisions. In reviewing issuance of construction permits the Commission recognized at the outset that it had a duty to analyze water avail-

294. 10 C.F.R. § 51.5(a)(1) (1975).

295. *Id.* § 51.5(a)(2).

296. *Id.* § 51.5(a)(10). Note that in Scientists' Institute for Public Information, Inc. v. AEC, 481 F.2d 1079 (D.C. Cir. 1973), it was held that an impact statement is required under NEPA not only when the Commission proposes to build a facility itself, but also whenever it makes a decision that permits action by other parties that will affect the quality of the human environment. Under its regulations the Commission, in accordance with Council on Environmental Quality guidelines, can require an impact statement before the issuance of an amended construction permit, a full power or design capacity license, or a license to operate at less than full or design capacity. 10 C.F.R. § 51.5(b)(2)-(3) (1975); see Frank Walton League of America v. Schlesinger, 337 F. Supp. 287 (D.D.C. 1971) (application for fifty per cent operating license that involves discharge of heated water that will endanger fish and wildlife site thermal standards constitutes an act significantly affecting human environment and requires environmental impact statement). Additional regulations require submission of an environmental report by the applicant for a permit or license, 10 C.F.R. §§ 51.20-21 (1975), but the required contents of the impact statements, *id.* § 51.23, and provide for the circulation and review of draft statements and the preparation of final statements, *id.* §§ 51.24, 51.26. Finally, provision is made for public hearings and review of all impact statements required by the Commission. *Id.* § 51.32.

297. See Environmental Defense Fund, Inc. v. Corps of Engineers, 324 F. Supp. 828 (D.D.C. 1971) (water supply impact of Cross-Terris Barge Canal). See also Hinkley v. Mitchell, 460 F.2d 646 (2d Cir.), cert. denied, 409 U.S. 990 (1972) (NEPA requires consideration of any and every effect that a project or project might have on the quality of the human environment).

The availability of cooling water is one of the most important factors in choosing the site for a nuclear power plant. Energy Policy Staff, Office of Science and Technology, Considerations Affecting Steam Power Plant Site Selection, 22 (1968); Baran, *The Legal and Policy Framework for Thermal Discharge from Nuclear Power Plants*, 3 *Environ. Affairs* 305 (1973); Bronstein, *The AEC Decision Making Process and the Environment: A Case Study of the Calvert Cliffs Nuclear Power Plant*, 1 *Ecol. L.Q.* 689 (1973).

ability and the impact of alternative methods for providing cooling water as part of a "good faith effort . . . to describe the reasonably foreseeable impact of a proposed action."²⁹⁸ Although final decision-making authority over the water question rested with DRHC,²⁹⁹ the NRC considered alternative water arrangements including the proposed Tocks Island Dam,³⁰⁰ the "river follower" system,³⁰¹ and a supplemental reservoir.

One procedural weakness that can prevent consumptive use problems from receiving the weight they deserve or the comprehensive approach they need is that NRC review of construction permit applications—the first point at which an environmental statement is prepared³⁰²—comes late in a long process of planning and designing a nuclear facility. By that time a utility proposing to build a nuclear plant will have expended considerable time, effort, manpower, and funds in facility design, site selection and acquisition, and preliminary site preparation.³⁰³ Moreover, long lead time plant components, such as reactor vessels and steam turbines, will have been ordered from and at least partially fabricated by manufacturers. As a consequence several courts have recognized that because prior expenditures of funds and irrevocable commitments of resources must be considered by the agency as elements in the NEPA cost-benefit analysis, each additional increment of money invested in a project tilts the balance away from environmental concerns.³⁰⁴ Although an agency's decision on the stage of a project at which a NEPA statement must be prepared is subject to judicial scrutiny,³⁰⁵ the NRC's requirement of a critical impact statement only at the construction permit stage remains effectively unchallenged.³⁰⁶ By that time suf-

298. *In re Philadelphia Electric Co. (Limerick Generating Station)*, Atomic Safety & Licensing Appeal Bd., 181, Nov. 30 1972, 50 153, ALAB 262 (March 19, 1973), at 41, *off'd*, Environmental Coalition of Nuclear Power v. FERC, No. 73 1421 (D.C. Cir. Nov. 12, 1973).

299. *Id.* at 42-43; see notes 228-80 and accompanying text *supra*.

300. At the time of NRC's decision in March 1975, the Tocks Island project proposed by the Corps of Engineers was still in official favor. Although Tocks was not rejected by DRHC until July, the NRC decision foresaw the possibility and recognized the need to assess alternative water supply approaches.

301. See notes 254-59 *supra*.

302. 10 C.F.R. § 50.15(a)(1) (1975).

303. See, e.g., Bronstein, *The AEC Decision-Making Process and the Environment: A Case Study of the Calvert Cliffs Nuclear Power Plant*, 1 *Ecol. L.Q.* 689 (1973). Bronstein estimated that site acquisition costs for the Calvert Cliffs station were \$1.6 million as compared to an overall construction and plant cost of \$347 million.

304. Coalition for Safe Nuclear Power v. AEC, 463 F.2d 951 (D.C. Cir. 1972); *Morningside Lagoon Park Ass'n v. Volpe*, 334 F. Supp. 132 (N.D. Ga. 1971). See also Environmental Defense Fund, Inc. v. Corps of Engineers, 470 F.2d 289 (8th Cir. 1972) (court ruled that in view of the fact that more than \$10 million had been expended, the project should be approved despite the existence of environmental problems).

305. Scientists Institute for Public Information, Inc. v. AEC, 481 F.2d 1079 (D.C. Cir. 1973); F. Abrams, *NEPA in the Courts* 179-86 (1973).

306. See, e.g., *Environmental Coalition of Nuclear Power v. FERC*, 1073.

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ficient resources may have been expended to limit or prejudice the environmental review process.

Perhaps the most serious problem is NRC's lack of authority or expertise to act as a comprehensive water planning agency. The Commission can review water uses in power plants only through individual impact statement analyses. It is unable to coordinate power plant water withdrawals with other water management decisions and must rely upon state and basin water agencies to the extent they exist and are effective.

The shortcomings of NRC's planning and review of nuclear facilities, at least in the water use field, are exemplified by the Limerick case.³⁰⁷ The Commission found that the river follower mode of operation would allow economically viable operation of the Limerick facility,³⁰⁸ although note was made that construction of a supplemental reservoir might improve the plant's benefit/cost ratio.³⁰⁹ While recognizing the strong possibility that a supplemental reservoir would be required by DRBC if the Tocks Island Dam is not built, NRC gave the reservoir alternative only a "generic" evaluation. No specific reservoir sites were approved.³¹⁰ The Commission merely attempted to identify and appraise the range of "environmental costs which would likely be incurred no matter which of the numerous

AEC regulations requiring an impact statement only at the construction permit stage on the ground that the regulations did not go far enough to implement NEPA. The petitioners contended that the AEC should prohibit site acquisition until after an impact statement has been prepared. The court dismissed the action on the grounds that the petitioners had waived their right to complain by failing to participate in the rulemaking proceeding at which the challenged regulations were formulated and noted that, in any event, the petitioners could ask for new rulemaking in this regard under 10 C.F.R. § 2.802.803 (1975). Although the court declined to rule on the merits of the petitioners' complaint, it did express the view that the AEC had no power to interfere with the free alienation of property by prohibiting a utility from acquiring a desired site because of problems identified in the impact statement. While such an observation may indeed be true, it overlooks the fact that a requirement of an impact statement before the acquisition of land for a nuclear power plant site would not be a prohibition against a utility's purchase of land, but merely a restriction on the use of that land for a nuclear electric generating facility. The AEC in its regulatory capacity had always exercised such power in granting or denying construction permits and operating licenses.

307. See notes 298-301 and accompanying text *supra*.

308. *In re Philadelphia Electric Co. (Limerick Generating Station)*, Atomic Safety & Licensing Appeal Bd., Dkt. Nos. 50-352, 50-353, ALAB 262 (March 19, 1975), at 42-43, 79-92.

309. *Id.* at 83-84, 91.

310. A previous study by the Delaware River Basin Commission initially had explored the possibility of using a supplemental reservoir for the Limerick plant. A number of reservoir sites were discussed by state and commission staff, but detailed site evaluations were not conducted. *Id.* at 10, 20-22.

potential sites . . . might eventually be selected by DRBC as the most appropriate locale for a supplemental reservoir.³¹¹ Ultimately NRC determined that "[c]onstruction of the Limerick facility should not be now authorized on the basis of an overall cost/benefit balance which presupposed employment of either the Tocks Island or the supplemental reservoir alternative."³¹² This balance could not be struck until further decisions are made and information collected. Since the river follower scheme appeared viable, the Commission found "no reason to withhold approval of construction simply because of the contingency that one of the two other alternatives might later be adopted."³¹³

Although NRC's issuance of construction permits for Limerick ultimately was upheld by the court,³¹⁴ substantial questions are raised by both the NRC and DRBC position of interim approval based on the river follower scheme. The river follower provisions of the permit theoretically would require Limerick to shut down when flows in the three source streams fall below designated levels. Other water users apparently would be protected during the most critical drought periods. According to the DRBC analysis the first of Limerick's two units will constitute 10.6 percent of Philadelphia Electric's 1981 generating capacity and two percent of the capacity for the Pennsylvania-New Jersey-Maryland (PJM) Interconnection power pool.³¹⁵ By 1984 the PJM pool is projected to have a reserve capacity of 23.9 percent.³¹⁶ DRBC concluded that even if all five generating stations under the river follower regime³¹⁷ were shut down simultaneously, sufficient generating capacity including interconnections and reserves would still exist to meet loads.³¹⁸ This assumes, however, that virtually all of the other PJM plants would be operational when operations at the five river follower stations are curtailed during low flow. The scheme appears to leave little room for emergency conditions and normal maintenance shutdowns in other parts of the PJM system.³¹⁹ Miscalculated adoption of the river follower scheme for a number of plants may leave the basin commission and public with an unenviable choice in a future

311. *Id.* at 73-74.

312. *Id.* at 79.

313. *Id.*

314. Environmental Coalition on Nuclear Power v. NRC, No. 75-1421 (Old Cir., Nov. 12, 1975).

315. *In re Philadelphia Electric Co., Limerick Nuclear Generating Station*, DRBC Dkt. No. D-69-210 CP (Final) (Nov. 5, 1975), at 11.

316. *Id.* at 12.

317. These include Limerick, Summit, Hope Creek, Gilbert, and Martins Creek. For a description of these plants see DRBC 1975 Master Siting Study, *supra* note 51.

318. DRBC Dkt. No. D-69-210 CP (Final) at 11.

319. DRBC did not mention this potential problem in its docket decision and

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drought, to suffer shortages of electricity, to face even more critical water scarcity, or to allow discharge of untreated thermal wastes.

Limerick highlights an even more serious need to consider power plant siting and water use in the context of overall basin water resources management. An effective use of a basin's resources demands that water use and supplementary storage as needed by all generating stations be coordinated and planned with reference to a master siting study.³²⁰ In the Delaware basin, for example, eight generating stations are involved in the water supply area. Five stations using 86 CFS (including Limerick) are or may be subject to river follower low flow constraints. Three of these five stations, using 70.7 CFS, are owned by the same three companies that own other stations (Salem, Edlystone, and Edge Moor) not previously made subject to river follower regimes.³²¹ If these companies are able to build water supply facilities to meet the requirements of the docket decision for one project, they could satisfy similar requirements for all their projects easily and economically at the same time. For example, Philadelphia Electric Company, in building a facility to meet Limerick's needs, could readily construct a slightly larger facility to provide both for Limerick's requirements of 54.3 CFS and for the Edlystone station's requirements of 3.9 CFS.³²²

The case-by-case review of power projects currently conducted by NRC and DRHC cannot be expected to protect adequately the interests of other users and the public over a long period. Only preparation of a basin-wide plan for assessing water availability, siting power plants, and establishing detailed criteria for power project water withdrawals will provide the information required for rational approval of new generating projects the NRC, state agencies, and basin commissions.³²³ The foundation of a total water management program is necessary before a multitude of new power uses are initiated and limited resources are committed.

(b) *Review of NRC actions.*—Riparian owners, municipalities, public water agencies, and other users that could be injured by a powerplant's withdrawals can intervene in NRC proceedings. If they properly participate in and exhaust available administrative proceed-

320. See DRHC Dkt. No. D-60-210 CP (Final), at 11; notes 244-49 and accompanying text *supra*.

321. DRHC Dkt. No. D-60-210 CP (Final), at 11.

322. *Id.* at 13.

323. DRHC is reassessing its comprehensive plan in light of changed conditions and pressing water needs. *Id.*

ings,³²⁴ the interveners can seek judicial reversal³²⁵ of the final NRC decision on various grounds, including (1) failure of the agency to balance properly the benefits of power production against the cost

324. AEC (NRC) regulations provide that no permit, license, or order for which an environmental impact statement is required shall be issued until ninety days after a draft impact statement (or thirty days after a final impact statement) has been circulated for comment to the Council on Environmental Quality and made available to the public. 10 C.F.R. § 51.31 (1975). A public hearing on the impact statement is required. *Id.* § 51.52. The hearing officer must determine if NEPA requirements have been met and is authorized to consider independently the cost benefit analysis and recommend agency action based on the impact statement. All interested persons can participate in the hearing and offer evidence regarding the impact assessment and any aspect of the proposed NRC action. In addition, any person whose interests may be affected can petition for leave to intervene as a party in NRC license proceedings. *Id.* § 2.714. As a general rule, any person with more than a passing interest will be permitted to intervene. See Comment, *The Proper Role of the Public in Power Plant Licensing Decisions*, 15 *Antitrust & Trade Reg. J.* 34 (1973). Interveners are designated as full parties to the proceeding. 10 C.F.R. § 2.714(g) (1975). Persons not designated as full parties nevertheless may be permitted to make a limited appearance with respect to certain issues at the discretion of the presiding officer. *Id.* § 2.715. Details of a request for a hearing or a petition to intervene are appealable to the Atomic Safety and Licensing Appeal Board. *Id.* § 2.714(a). Of course, the right to intervene can be waived inadvertently by a lack of timely petition to intervene. *Fashion Dist. Council v. AEC*, 434 F.2d 847 (D.C. Cir. 1970).

When a person has a right to intervene but fails to do so (*Gage v. AEC*, 493 F.2d 1214 (D.C. Cir. 1973)) or when he has not requested a full agency review or exhausted available remedies within the agency (Coalition for Safe Nuclear Power v. AEC, 463 F.2d 934 (D.C. Cir. 1972)), the courts may refrain from judicial review of agency action. Thus, it behooves an interested or potentially aggrieved party to petition for intervenor status early, to participate in all agency proceedings, and to exhaust the available agency remedies to preserve the right to seek judicial review of agency's final action.

325. Section 10 of the Administrative Procedure Act provides persons aggrieved by an agency action the right to seek judicial review in federal court. 5 U.S.C. § 702 (1970). This includes the power to seek judicial review of an agency's failure to fulfill the mandates of NEPA in conducting or approving an action that may significantly affect the environment. *Silva v. Lynn*, 482 F.2d 1282 (1st Cir. 1973); *Cape Henry Bird Club v. Laird*, 339 F. Supp. 404 (2d Cir. Va.), *aff'd*, 484 F.2d 453 (4th Cir. 1973); *Harrington Coalition Against Baiting the Lynx v. Volpe*, 310 F. Supp. 918 (M.D. Pa. 1971). Standing to seek review requires that the party suffer injury in fact and that the injury be within the zone of interests protected by the statute claimed to have been violated. *Barlow v. Collins*, 397 U.S. 159 (1970); Association of Data Processing Serv. Org., Inc. v. Camp, 397 U.S. 150 (1970). The injury alleged, whether to economic, recreational, or aesthetic interests, must be "individualized," that is, it must be to the specific party seeking judicial review. *Silva v. Lynn*, 482 F.2d 1282 (1st Cir. 1973). In this regard, it has been held that allegations that a particular project would adversely affect a party's hunting and fishing pursuits on a river, together with land uses of a riparian owner, or destroy the water supply of complainants, are all sufficient to give standing. *Environmental Defense Fund, Inc. v. VA*, 468 F.2d 1164 (6th Cir. 1972); *Environmental Defense Fund, Inc. v. Corps of Engineers*, 334 F. Supp. 916 (N.D. Miss. 1972); *Natural Resources Defense Council, Inc. v. Grant*, 341 F. Supp. 356 (E.D.N.C. 1972); *Environmental Defense Fund, Inc. v. Corps of Engineers*, 325 F. Supp. 728 (E.D. Ark. 1971), *aff'd*, 470 F.2d 289 (8th Cir. 1972); *Environmental Defense Fund, Inc. v. Corps of Engineers*, 324 F. Supp. 878 (D.C. 1971). *Calvert Cliffs Coordinating Comm. v. AEC*, 419 F.2d 1109 (D.C. Cir. 1971), clearly established that environmental aspects of a nuclear power plant are within the zone of interest of NEPA and that NEPA makes NRC decisions affecting the environment judicially reviewable. Consequently, there is little doubt that parties whose water rights would be adversely affected by a nuclear power plant's consumptive use would have a right to challenge the NRC's grant of a construction permit or an operating

of impaired water supplies, (2) failure to consider alternative plant siting or design, and (3) failure to consider water management alternatives that would increase available water and reduce adverse water resource impact. NEPA, however, grants at best only limited substantive rights to those challenging agency actions. An aggrieved party cannot use NEPA to recover damages,³²⁶ but is confined to preventing agency action based on failure to comply with the statute's procedural mandates in preparing a thorough impact assessment.³²⁷ Only a few cases have suggested an enforceable, affirmative duty on the agencies to mitigate adverse environmental impacts incurred as part of an activity governed by NEPA.³²⁸

The scope of review in NEPA cases has largely followed traditionally narrow administrative appeal tests. The party challenging an agency's NEPA decision must prove by a preponderance of the evidence³²⁹ that the agency failed to engage in "a full, good faith

consideration and balancing of environmental factors"³³⁰ before reaching its decision or that "the actual balance of costs and benefits that was struck was arbitrary or clearly gave insufficient weight to environmental factors."³³¹ The fundamental inquiries are whether the agency acted within the scope of its authority, whether its decision was arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law, and whether all procedural mandates were followed.³³² The court must determine that the agency considered all relevant elements³³³ and took a "hard look" at the environmental impact of and alternatives to a proposed action.³³⁴ It is unclear whether NEPA mandates selection of the least adverse alternative to a project³³⁵ or imposition of the least adverse set of conditions upon its approval. Nor is it settled that NEPA requires agencies and their licensees to take affirmative steps to ameliorate avoidable environmental harm.

While a few decisions indicate a judicial willingness to engage in a broader review of agency NEPA decisions,³³⁶ the Supreme Court's pronouncement in *Citizens to Preserve Overton Park v. Volpe*³³⁷ remains the guiding formula. Although the court's inquiry into the facts is to be searching and careful, the ultimate stand-

326. *Pye v. Georgia Dept. of Transp.*, 513 F.2d 290, 7 E.R.C. 2006 (5th Cir. 1975); *Morris v. TVA*, 345 F. Supp. 321, 324 (N.D. Ala. 1972); *Virginians for Dulles v. Volpe*, 314 F. Supp. 573, 578 (E.D. Va. 1972).

327. *See Bradford Twp. v. Illinois State Toll Highway Auth.*, 463 F.2d 517 (7th Cir.), cert. denied, 409 U.S. 1047 (1972); *Environmental Defense Fund, Inc. v. Corps of Engineers*, 335 F. Supp. 728 (C.D. Ark. 1971), *aff'd*, 470 F.2d 289 (8th Cir. 1972); *Pritz v. Volpe*, 4 E.R.C. 1195 (M.D. Ala.), *aff'd*, 467 F.2d 208 (5th Cir. 1972); *Virginians for Dulles v. Volpe*, 344 F. Supp. 573 (E.D. Va. 1972).

328. *In Sierra Club v. Froehle*, 359 F. Supp. 1289 (S.D. Tex. 1972), *rev'd* on other grounds *sub nom. Sierra Club v. Callaway*, 499 F.2d 982 (5th Cir. 1974), the district judge concluded,

NEPA states indirectly, but affirmatively, that under some circumstances federal agencies must mitigate some and possibly all of the environmental impacts arising from a proposed project. This requirement is embodied primarily within Section 101, 42 U.S.C.A. § 4321, with important implementing assistance from Section 102, 42 U.S.C.A. § 4332. . . . The courts should not impose unreasonable extremes of compliance or interpret themselves into the area of discretion as to what action should be taken, . . . but they should not hesitate to require further agency consideration when a project appears to call for mitigation and yet none was considered or only a half hearted effort was made.

Id. at 1319-40; *see* *Alex v. Reon*, 339 F. Supp. 1375 (W.D. Tenn.), *aff'd*, 4 E.R.C. 1966 (W.D. Tenn. 1972) (mitigation plan for stream channelization project found insufficient under NEPA); *cf. Maryland Nat'l Capital Park & Planning Comm'n v. United States Postal Service*, 487 F.2d 1029, 1042 (D.C. Cir. 1973) (action when no environmental impact statement has been filed for an agency action, court can condition its decision not to issue an injunction on agency agreement to modify design to eliminate environmental harm). In a pending Pennsylvania case, "mitigation damages" have been requested to compensate the environment for losses created by the routing of the I-95 highway through Tincumb Marsh. These "damages" could be awarded in the form of equitable relief requiring the Federal Highway Administration to purchase other areas of marsh land and dedicate them to wildlife preservation. *Stewart v. Resor*, Civil Action No. 70-551 (E.D. Pa., filed Feb. 17, 1976).

329. *Sierra Club v. Callaway*, 499 F.2d 982, 992 (5th Cir. 1974); *Environmental Defense Fund, Inc. v. Corps of Engineers*, 492 F.2d 1123, 1130-31 (5th Cir. 1974).

330. *Environmental Defense Fund, Inc. v. Corps of Engineers*, 470 F.2d 289, 300 (8th Cir. 1972); *Colbert Clubs' Coordinating Comm. v. AEC*, 449 F.2d 1109 (D.C. Cir. 1971).

331. *Colbert Clubs' Coordinating Comm. v. AEC*, 449 F.2d 1109, 1115 (D.C. Cir. 1971); *accord, Environmental Defense Fund, Inc. v. Corps of Engineers*, 470 F.2d 289, 300 (8th Cir. 1972).

332. *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 416 (1971); *Environmental Defense Fund, Inc. v. Corps of Engineers*, 470 F.2d 289, 300 (8th Cir. 1972).

333. Cases cited note 332 *supra*; *L. Jaffe, Journal. Control or Administrative Action* 182 (1965).

334. *Scientists' Inst. for Pub. Inform., Inc. v. AEC*, 481 F.2d 1039 (D.C. Cir. 1973); *Environmental Defense Fund, Inc. v. Corps of Engineers*, 470 F.2d 289 (8th Cir. 1972); *National Resources Defense Council, Inc. v. Morton*, 438 F.2d 827 (D.C. Cir. 1972); *Environmental Defense Fund, Inc. v. TVA*, 468 F.2d 1166 (6th Cir. 1972). Although the alternatives that must be considered should be those that are reasonably available, they are not limited solely to actions that the agency has the power to adopt. An agency is not relieved of the duty to consider alternatives merely because they would require legislative action or cooperation of another agency or would be administratively difficult. *Environmental Defense Fund, Inc. v. Froehle*, 473 F.2d 346 (8th Cir. 1972); *National Resources Defense Council, Inc. v. Morton*, *supra*. But *see* *National Resources Corp. v. Morton*, 486 F.2d 995, 1004 (10th Cir. 1973), 361 F. Supp. 78 (11th Cir. 1973) (overturning order requiring consideration of a broad range of executive and legislative action as alternatives to cancellation of helium procurement contracts). One alternative an agency must consider is taking no action at all. NRC regulations specifying the contents of impact statements require consideration of the "no action" alternative. 10 C.F.R. § 11.55(c)(15) (1973).

335. *See* Note, *The "No Action" Alternative Approach to Substantive Review Under NEPA*, 88 Harv. L. Rev. 735 (1975).

336. *See, e.g., National Health Council v. Morton*, 486 F.2d 995 (10th Cir. 1973); *Silva v. Lynn*, 482 F.2d 1282 (1st Cir. 1973); *Conservation Council v. Froehle*, 473 F.2d 664 (4th Cir. 1973); *Conservation Society v. Secretary of Transp.*, 362 F. Supp. 637 (D. Va. 1973).

ard of review is a narrow one. The court is not empowered to substitute its judgment for that of the agency.³³⁶

2. *Other Federal Agencies*.—No federal agencies other than the NRC have direct control over the siting, licensing, or water diversions of thermal-electric plants in Pennsylvania. The United States Supreme Court recently confirmed that the Federal Power Commission has no authority to regulate thermal-electric facilities.³³⁷ Reversing a lower court ruling that FPC had at least limited power to control power plant use of "surplus water" from federally owned dams,³³⁸ the Court held that jurisdiction under the Federal Power Act³³⁹ was confined to hydroelectric projects.³⁴⁰

The Federal Nonnuclear Energy Research and Development Act of 1974³⁴¹ directly addresses the problem of water uses in energy projects. The Energy Research and Development Administration (ERDA) is empowered, as part of its research, development, and demonstration projects, to request the interagency Water Resources Council³⁴² to assess water resource requirements and water availability for energy technologies that are the subject of federal research and development efforts.³⁴³ A Water Resources Council evaluation of the environmental, social, and economic impacts of proposed water uses is required prior to ERDA approval of federal assistance for demonstration projects and commercial applications of

336. *Id.* at 416, quoted in *Environmental Defense Fund, Inc. v. Corps of Engineers*, 470 F.2d 289, 300 (8th Cir. 1972).

337. *Chenoweth Tribe of Indians v. FPC*, 420 U.S. 395 (1975).

338. *Chenoweth Tribe of Indians v. FPC*, 489 F.2d 1207, 4740 (D.C. Cir. 1973). The circuit court opinion had argued that 16 U.S.C. § 797(c) (1970) gave the FPC licensing jurisdiction over

nonfederal construction and operation of water power projects on navigable waters, public lands, or reservations, and for the licensing of the nonfederal use either of water impounded by a government dam in excess of the amount needed to accomplish the purpose of the dam or of actual hydroelectricity generated by a Government dam and not required for governmental purposes.

The Supreme Court, however, found that the "surplus water" clause only applied to surplus water used in hydroelectric power projects. 420 U.S. at 416-22.

341. 16 U.S.C. §§ 791a-823 (1970). The Federal Power Act was enacted originally as the Federal Water Power Act, Act of June 10, 1920, ch. 285, § 320, 41 Stat. 1072, and was amended to its present form by the Act of Aug. 26, 1935, ch. 687, tit. II, § 212, 49 Stat. 847.

342. Included here are both traditional power dams and pumped storage projects that utilize the mechanical potential of water to drive turbine generators. 16 U.S.C. v. Union Elec. Co., 381 U.S. 90, 98-99 (1965); *See* *Hudson Preserv. Conf. v. FPC*, 354 F.2d 608 (2d Cir. 1965), *certiorari denied*, 453 F.2d 463 (2d Cir. 1971).

343. 42 U.S.C.A. § 5901-15 (Supp. 1976).

344. *See* notes 347-49 *infra*.

345. 42 U.S.C.A. § 5912(a) (Supp. 1976).

energy technologies covered under the Act.³⁴⁶ ERDA, however, is not a regulatory agency. Its authority is limited to research and development of energy technologies. Only the water uses of research and development projects are subject to the assessment provisions of the Nonnuclear Energy Research and Development Act. Therefore, it is unlikely that ERDA will have any significant effect upon consumptive water uses in conventional thermal-electric power facilities.

The Federal Water Resources Council, formed by the Water Resources Planning Act,³⁴⁷ similarly is restricted to an advisory role. The Council's duties to review river basin commission plans and maintain a continuing study of the adequacy of water supplies for each region's requirements,³⁴⁸ together with its special studies of energy-related water problems,³⁴⁹ may form an important basis for future water decisions. The Council, however, has no direct control over water uses.

V. Conclusion

The need to dispose of waste heat from power facilities and the consumptive water losses inherent in current thermal waste control technology clearly pose a major challenge to our water resource laws and institutions, a challenge that to some extent has been recognized, but not yet effectively addressed.

State law on the subject in Pennsylvania and many other eastern states is antiquated and confusing. The riparian doctrine leaves neither electric utilities nor other users with secure water rights in the event of shortage. The protracted litigation necessary to enforce riparian rights often will render "justice" long after the drought has ended—a prospect all water users should view with dismay. Past legislative efforts have been sporadic, ill-drafted, and poorly monitored. Amendments in the Limited Power Act³⁵⁰ allow the Commonwealth to oversee consumptive power withdrawals from relatively minor, nonnavigable streams, while canceling jurisdiction over large takings from Pennsylvania's great navigable rivers. Although the Commonwealth may continue to attempt regulation of power plant water uses under its 1913 Water Obstruction Act,³⁵¹ that statutory structure is an incomplete and ineffective foundation for water management planning and for resolving water use conflicts.

336. *Id.* § 5912(b)-(c).

347. *Id.* § 1962 (1974).

348. *Id.* § 1962a-1.

349. *See* PROJECT INTERDEPENDENCE BLUEPRINT, *supra* note 7.

350. *See* notes 198-212 and accompanying text *supra*.

351. *See* notes 213-214 and accompanying text *supra*.

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POOR ORIGINAL

Appendix H

Delaware River Basin Commission
Electrical Generating Facility Procedures

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Enclosure 1



JAMES F. WRIGHT
EXECUTIVE DIRECTOR

DELAWARE RIVER BASIN COMMISSION
P. O. BOX 7360
WEST TRENTON, NEW JERSEY 08628
(609) 883-9500

HEADQUARTERS LOCATION
25 STATE POLICE DRIVE
WEST TRENTON, N. J.

January 28, 1977

Mr. Clifford H. McConnell
Deputy Secretary
Bureau of Engineering and Construction
Department of Environmental Resources
Harrisburg, Pennsylvania 17120

Re: ICWP draft report: Water Supply
and the Nuclear Licensing
Process
RM-R 60:84E

Dear Mr. McConnell:

I very much appreciate your invitation to comment upon the subject draft report. It has been reviewed and the Delaware River Basin Commission procedures relating to the provision of water supply for nuclear production and utilization facilities are hereafter set forth.

The Delaware River Basin Commission (DRBC), under its federal-interstate compact authority, is required under its project review responsibility under the Compact (Article 3.8) to carry out the following procedure:

"No project having a substantial effect on the water resources of the basin shall hereafter be undertaken by any person, corporation or governmental authority unless it shall have been first submitted to and approved by the Commission The Commission shall approve a project whenever it finds and determines that such project would not substantially impair or conflict with the Comprehensive Plan and may modify and approve as modified, or may disapprove any such project whenever it finds and determines that the project would substantially impair or conflict with such plan... ."

With respect to water supply for electric generating projects, the Commission adopted, in 1971, an amendment to its Rules of Practice and Procedure relating to siting studies for major electric generating projects. It is contained in Section 2-3.5.2 of the Rules (copy enclosed, pages 14, 15, 16). Ever since the adoption of Section 2-3.5.2, the electric utility companies have, almost annually, prepared and updated the Master Siting Study required by the Rules. This has given the DRBC and other basin regulatory agencies a 15-year preview on the plans of the

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utilities. Such a preview allows the DRBC sufficient lead time to incorporate the future water supply needs of the utilities in the overall water supply plans for the Basin. It also allows possible siting problems to be identified early enough to consider alternatives, and prohibits piece-meal approvals which, prior to that time, had in some instances, allowed utilities to sink significant costs into a site prior to its full-scale review for approval.

The DRBC has also found it useful in certain instances, working with NRC, in its review of projects, to adopt conditional approvals on the water supply to be allocated to specific projects. Where there is some uncertainty as to the availability of certain planned water supply reservoirs, in many cases ten or more years into the future after the construction permit for the generating plant is required, the DRBC has conditioned its approval on the water supply aspects to a future review of the water needs and available supplies nearer to the time when the generating units are scheduled to be completed. Based upon this later review, the DRBC then advises the utility if sufficient water supply is available for all uses in the basin including the applicants or, if not, directs the utility to construct its own water supply storage for providing its consumptive use requirements during low flow periods. It is generally agreed by all parties concerned that it is desirable and more efficient to have one agency, such as DRBC, controlling the water supply storage for all users in the basin, but for various reasons this may not always be possible.

We agree that water supply (quantity) cannot be separated from water quality consideration and the review process does provide for a water quality review against required DRBC and state water quality standards.

The DRBC is now in a position to carry out the interstate coordination that is suggested in the "Nuclear Energy Center Site Survey - 1975, Executive Summary" (NUREG - 0001 - ES) (page 13):

"Interstate cooperation - Regional arrangements may be necessary to secure interstate jurisdictional coordination and to assure establishment of reasonable equity among the various producer, user, and neighbor groups that might be unequally affected by the centers' costs and benefits. Regional arrangements among the States involved, following patterns already established in various State compacts, could further NEC development by taking into account the interests and viewpoints of affected State and local communities, as well as the national interest. Such arrangements would facilitate Federal-State decision-making regarding center

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siting and could provide a useful framework for necessary inter-jurisdictional cooperation in the centers' continuing operation."

This Commission, being an agency of four states and also of the federal government, also has environmental assessment responsibilities over those projects which have, or may have a significant effect. Our permit procedures with respect to water quality and related environmental aspects are partially stated in the permit issued for the Limerick Nuclear Project (Docket D-69-210 CP), e.g.: DRBC "...as a federal-interstate body, cannot approve (a) project until the full disclosure provisions of NEPA have been satisfied." However, since the AEC called upon DRBC to act upon the water supply aspects of the application for the Limerick project before it would prepare its full EIS, the DRBC decided to consider the water aspects of the application -

"...in such a way that its action will have no environmental effect unless and until an environmental evaluation of the entire project has been completed under Section 102 of NEPA. This can be done by withholding any of the formal approvals which are required under the Delaware River Basin Compact before a project may proceed, and by making any water allocation specifically contingent upon the acceptance by the CEQ of the environmental impact statement prepared and filed by the lead agency. In the Commission's view, such an action would be neither major nor irreversible in its effect on the human environment, within the meaning of the statute, particularly in view of the unique interrelationship of the AEC as lead agency with the proceeding before this Commission."

This precedent-setting conclusion is applicable to future projects and is linked with the constraint which prohibits the use of the Delaware River water when such use would reduce the flow in the river at the Trenton gage below 3000 cfs, which is required to meet the salinity objective in the estuary of 250 mg/l at mile 92.47 (mouth of the Schuylkill River).

In addition to site specific reviews and participation in the NEPA reviews, the DRBC has also required the electric utilities to conduct an overview environmental impact study of the possible cumulative impacts of all of the proposed sites contained in the Master Siting Study. Such a study is now underway and will address the following environmental issues.

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Although Resolution No. 71-3 in effect places a moratorium on any new power projects in this basin until the environmental phase of the siting study has been prepared, seven power plants have been, or are in the process of being reviewed by DRBC. Of these, four are fossil-fueled and three are nuclear powered. All seven have been subjected to detailed environmental analysis in accordance with the National Environmental Policy Act of 1969 and approval by DRBC is presently on a case by case basis. The studies have indicated several unresolved accumulative environmental issues associated with multiple power plants in one river basin worth noting.

- a. Excessive thermal discharge into the river due to close proximity of power plants and other waste discharges. At the present time the Commission is not accepting proposals for once-through cooling systems in the upper estuary. Studies are needed to determine whether once-through cooling should be used at all in the basin and to disclose the ramifications of a no once-through cooling water policy.
- b. A minimum low-flow problem to maintain the salt front in the estuary. There have been delays in the development of adequate water storage facilities in the basin and, as a result, all proposed power plants having depletive water losses (due to cooling towers or instream induced evaporation) are being required to find suitable water makeup to maintain a minimum low flow during drought periods. These water makeup alternatives may have many serious environmental impacts.
- c. The accumulated problems associated with the water intake system such as entrainment and impingement have not been given suitable analysis to ascertain their significance on the basin waters.
- d. The method of fuel delivery as well as the type of fuel used for power plants have become major issues. It is obvious the basin can expect additional transmission lines carrying not only electricity but oil, gas and possibly coal products. The use of oil is under detailed scrutiny by the federal government. The

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increasing number of nuclear power plants raises the question of fuel movement and amount. Recently an environmental health consultant to DRBC has expressed significant concern for the amount of radiological fuels that will be in transit within the basin as a result of the existing and proposed nuclear power plants.


- e. The expanded use of nuclear fuels may precipitate a proposal for a fuel reprocessing plant in or near the basin.

The ICWP draft report makes extensive reference to the riparian and appropriative water right doctrines. DRBC follows the doctrine of equitable apportionment. The doctrine of equitable apportionment seems to have been followed by the courts in some of the major legal contests. Hence, your report should include reference to this doctrine.

The ICWP report should also take cognizance of the loss of water rights by severance under the riparian doctrine and the ever increasing number of permits that are being awarded in riparian states. The issuance of such permits seems tantamount to the use of the appropriate water rights doctrine.

We concur with the items contained in the Summary - General Siting Issues on pages 12 and 13 of the draft report and the General Summary on pages 16 and 17, which although written from a state perspective are generally appropriate from an inter-state viewpoint. The dangers associated with the transportation of new and spent nuclear fuels, page 15, seem understated.

Sincerely,


James F. Wright

enc.

cc: Mr. James Fish
Dr. William G. Mattox
Mr. Ray W. Rigby

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- (2) Operating costs and economies of various scales of operation;
- (3) Capability of handling industrial wastes with and without pre-treatment;
- (4) Capability to assimilate high peak flows and temporary shock loads or emergency conditions;
- (5) Space and facilities for sludge disposal;
- (6) Personnel skills required and their availability for operation and supervision;
- (7) Capacity to absorb growth; and the relative times required to place a separate and a regional system in operation;
- (8) Desirability of the site selection alternatives for the treatment plant in view of considerations of efficiency of land use, potential service area, and relative transmission distances;
- (9) The effect for a reasonable distance downstream on the quality of the receiving waters; and
- (10) Effectiveness of the proposal in identifying all sources of pollution, and in achieving a coordinated, comprehensive and orderly plan for abatement of pollution in the region.

(c) A preliminary engineering report shall accompany each application and shall include factual findings and conclusions with respect to items (1) through (8) above.

(d) For the purpose of this regulation, "a region" is defined to mean one or more drainage areas or parts thereof. A "regional solution" is one which is based upon a feasibility study of the region for which a single system of sewage collection and treatment would be physically and economically feasible.

2-3.5.2 Siting Studies for Major Electric Generation Projects.

(a) An application under Section 3.8 of the Compact for approval of an electric generating project with a design capacity of 100,000 KW or more

shall include, as part of the application: (1) a master siting study, (2) a site selection analysis for the project, and (3) the environmental statement otherwise required.

(b) (i) The master siting study shall describe in general terms all existing major electric generating projects of the applicant and of other public utilities using the water resources of the basin, and all such projects proposed or planned for the ensuing 15-year period. The master siting study shall describe particularly the impact of each proposed project on the water resources and related land resources of the basin. It shall include, with as much detail as is available, a description of the five-mile reach of any stream within which each proposed project is or will be located, the concept, capacity and fuel source of each project, the quantity and method of heat and moisture dissipation, the water resource requirements and water-related ecological effects of each proposed project in the study.

(ii) The master siting study will be reviewed by the Commission in relation to the Comprehensive Plan, may be employed as an input to the Comprehensive Plan, and may be considered, in whole or in part, for inclusion in the Plan. A master siting study may be amended from time to time to reflect changing power demands, technology and water resource conditions. The Commission will act in relation to a master siting study or amendment thereof only after public hearing.

(c) The site selection analysis shall demonstrate the relationship of the proposed project, and its specific location, to the master siting study. Prior to submitting the site selection analysis, the applicant shall circulate it for comment among other interested public utilities, the federal and state governmental agencies having jurisdiction over the siting of electric

generating stations in the state in which the project is located, regional or county planning commissions having jurisdiction in the project area, and such major water users as the Commission shall designate, and such comments shall be appended to and submitted together with the application. Prior to acting on the application, the Commission will make the site selection analysis available for public review and comment.

(d) The Commission will review each application for a major electric generating project with reference to the doctrine of equitable apportionment, including such priority of uses as will recognize alternative water resources and sites for electric generating projects, the increasing demands on the water resources of the basin and the optimum beneficial use of the water resources of the basin.

(e) The Commission will not act upon an application for approval under Section 3.8 of the Compact to initiate a partial or preliminary phase of an electric generating project which is subject to this regulation unless the application conforms to requirements of paragraph (a) hereof.

2-3.6 Sequence of Approval. A project will be considered by the Commission under Section 3.8 of the Compact either before or after any other state or federal review, in accordance with the provisions of the Administrative Agreement applicable to such project.

2-3.7 Form of Referral by State or Federal Agency. Upon approval by any state or federal agency of any project reviewable by the Commission under this Part, if the project has not prior thereto been reviewed and approved by the Commission, such agency shall refer the project for review under Section 3.8 of the Compact in such form and manner as shall be provided by Administrative Agreement.

2-3.8 Form of Submission of Projects not Requiring Prior Approval by State or Federal Agencies. Where a project does not require approval by any

Appendix I

State of South Carolina

Outline, Permits Required for
Cherokee Nuclear Station--Units 1, 2, 3

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State of South Carolina
Water Resources Commission



Clair P. Guess, Jr.
Executive Director

February 2, 1977


Mr. Jim Fish, ICWP Project Coordinator
F. Robert Edman & Associates, Inc.
W-3173 First National Bank Building
St. Paul, Minnesota 55101

Dear Jim:

In answer to your request by telephone on February 1, 1977, concerning the steps a utility must navigate in order to construct an operative facility, I have enclosed the following outline. This is a section of the EIS for the Cherokee Nuclear Plant of Duke Power Company presently nearing construction. As this summary is required and readily shows the different circumstances prevailing in each State, it would probably be beneficial to your purposes merely to acquire several typical project EIS's for comparison, if you have not already done so. The steps for a particular plant or facility in South Carolina may not all be identical, depending on specific location, plant design or whatever.

In South Carolina, riparian law does not allow for water allocation for a specific purpose, but the allocation is somewhat implied through water consumption considerations in several permit procedures. On page 1 the changes indicate that the NPDS permits are under State control, not EPA. If you need further explanation, please do not hesitate in calling.

Sincerely,


Christopher L. Brooks
Planner/Economist

CLB/jat
Enclosures

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Permits Required For
Cherokee Nuclear Station
Units 1, 2, 3

<u>Permit/Approval, Certification Description</u>	<u>Anticipated Application Submittal Date</u>	<u>Permit Required Date</u>	<u>Environmental Impact</u>
I. Federal Government			
A. Nuclear Regulatory Commission (NRC)			
1. Construction Permit	4-74	3-76	All Areas
2. Operating License	4-80	5-83	Operational Effects
B. Environmental Protection Agency (EPA) <i>S.C. Dept. of Health & Environmental Control</i>			
1. NPDES Permit	7-75	8-76	Water Quality
C. Federal Aviation Administration (FAA)			
1. Notification of obstruction to navigable airspace	9-75		Air (Ambient)
D. Federal Power Commission (FPC)			
1. Change in the proposed project boundry	7-75		Water Quality
E. U. S. Corps of Engineers			
1. Dredging and Transportation of Dredged Material - Notification	3-76	8-76	Water Quality
<i>\$10 or \$404 permits required depending on location</i>			

Amendment 2
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 Amendment 3
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ER Table 12.1.0-1 (Sheet 2 of 3)

Permits Required For
Cherokee Nuclear Station
Units 1, 2, 3

<u>Permit/Approval, Certification Description</u>	<u>Anticipated Application Submittal Date</u>	<u>Permit Required Date</u>	<u>Environmental Impact</u>
II. State of South Carolina			
A. Department of Health and Environmental Control			
1. Construction Permits (4a-d)	7-75	8-76	Water Quality
2. 401 Certification	7-75	2-76	
3. Sanitary Facilities ^{1, 2}	2-76 ¹ 4-80 ²	8-76 ¹ 4-83 ²	Water Quality
4. Authorization to Operate			
a) Wastewater Treatment System	5-81	5-82	Water Quality
b) Nuclear Service Water Pond (NSW)	5-81	5-82	Water Quality
c) Cooling Water System	5-82	5-83	Water Quality
d) Intake Sedimentation Basin	8-77	11-78	Water Quality
B. Public Service Commission			
1. Certificate to Construct a Major Facility	7-75	6-76	Planning Need for Plant

*C. Budget : Control Board
 permit for construction
 in the navigable waters
 of South Carolina
 (depends on location)*

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ER Table 12.1.0-1 (Sheet 3 of 3)

Permits Required For
Cherokee Nuclear Station
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<u>Permit/Approval, Certification Description</u>	<u>Anticipated Application Submittal Date</u>	<u>Permit Required Date</u>	<u>Environmental Impact</u>
III. Cherokee County and Other Regional Authorities			
A. Cherokee County Health Department			
1. Sewage facilities ^{1, 2}	2-76 ¹ 4-80 ²	8-76 ¹ 4-83 ²	Water Quality

NOTES:

¹ Temporary sewage facilities

² Permanent sewage facilities

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Amendment 3

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

POSTAGE AND FEES PAID
UNITED STATES NUCLEAR
REGULATORY COMMISSION



POOR ORIGINAL

849 300

~~849 334~~