REPORT OF THE STATE WATER COMMISSION

TO THE GOVERNOR AND THE GENERAL ASSEMBLY OF VIRGINIA

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COMMONWEALTH OF VIRGINIA
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Report of the
State Water Commission
To
The Governor and the General Assembly of Virginia
Richmond, Virginia
January, 1988

TO: Honorable Gerald L. Baliles, Governor of Virginia,
and
The General Assembly of Virginia

I. INTRODUCTION

The State Water Commission is a legislatively mandated fifteen-member panel (Va. Code § 9-145.5) whose purpose is to:

1. Study all aspects of water supply and allocation problems in the Commonwealth.

2. Coordinate the legislative recommendations of all state entities having responsibility with respect to water supplies and allocation issues.

II. COMMISSION DELIBERATIONS

In 1987 the Commission reviewed the Commonwealth's policies with respect to:
(i) the development of a water supply plan, (ii) the state groundwater management strategy, (iii) the protection of private water supplies and (iv) the reporting of water withdrawals by irrigators. The Commission met five times, holding public hearings in Prince William County (July 28, 1987) Roanoke (August 5, 1987), and Virginia Beach (August 6, 1987) followed by business meetings in Richmond (December 9, 1987 and January 29, 1988).

A. Water Supply Plans

The 1981 Session of the General Assembly enacted legislation directing the SWCB to prepare plans and program reports for each river basin and subbasin. In preparing the river basin plans and program reports the SWCB was to:

1. Estimate current water withdrawals and use of agriculture, industry, domestic use, and other significant categories of water users;

2. Project water withdrawals and use by agriculture, industry, domestic water use, and other significant categories of water uses;

3. Estimate, for each major river and stream the minimum in-stream flows necessary during drought conditions to maintain water quality and avoid permanent damage to aquatic life in streams, bays and estuaries;

4. Evaluate the ability of existing subsurface and surface water to meet current and future water uses, including minimum in-stream flows, during drought conditions;

5. Evaluate the current and future capability of public water systems to provide adequate quantity and quality of water;
6. Identify water management problems and alternative water management plans to address such problems;
7. Evaluate hydrologic, environmental, economic, social, legal, jurisdictional, and other aspects of each alternative management strategy identical; and
8. Upon request, provide water supply planning assistance to localities.

The SWCB was to include in its reports any recommended action to be considered by the General Assembly.

Officials of the SWCB presented a summary of their efforts to develop basin plans for the state's eleven planning areas (Appendix A, Chart 1). The basin plans examine the capability of the 542 largest public water supply systems (greater than 10,000 gallons per day) to meet the demands that will be placed on them, including industrial and agricultural needs by the year 2030. The plans were developed to enable the SWCB to assess the adequacy of the water supplies of communities and look at the options available to those communities to meet their future needs.

Virginia's supply of fresh water comes from rivers and streams, and ground and surface water stored in seventy-five reservoirs throughout the Commonwealth. In an average day approximately 28 billion gallons are available from these sources, with 27 billion coming from rivers and streams (Appendix A, Chart 2). According to estimates of the SWCB an extreme drought affecting all of the state's rivers and streams could theoretically reduce the total supply of fresh water to 2 billion gallons per day (BGD); although the likelihood of such an occurrence is extremely remote.

The current total withdrawals average 6.5 BGD of which 2.5 BGD is from saline sources. Of the 4 BGD in fresh water withdrawals thermopower is the largest user withdrawing approximately two-thirds of the water withdrawn each day. The remaining freshwater withdrawals are by the industrial/ manufacturing/mining section (15%), the domestic/commercial/institutional sector (13%), and the agricultural sector (2%). Although agriculture seemingly represents a small percentage of the withdrawals it remains significant since much of these withdrawals occur during drought situations (Appendix A, Chart 3). It should be noted that only 5% of the water is permanently withdrawn the vast majority is eventually returned to the water supply system.

Virginia's population is projected to increase from 5.3 million in 1980 to approximately 8 million by the year 2030. According to the SWCB this will result in a 450 MGD increase in freshwater demand or a total demand of 4.4 BGD within forty years (Appendix A, Charts 4 & 5).

In analyzing the 542 community water supplies the SWCB concluded that 134 systems (25% of the systems) will experience problems between now and 2030. The type of problems which are anticipated are: inadequate water sources (49%), transmission problems (20%), deficiencies in water treatment plans (20%), inadequate storage (10%) and source water quality problems (2%). Of the 134 systems which are expected to have problems, nearly one-third are currently experiencing problems and by the year 2000, 83% will have been confronted by these problems (Appendix A, Chart 6). The SWCB believes that all of these problems are technically solvable but at a cost, perhaps, in excess of $620 million.

The water supply plans contemplate a number of strategies to solve these problems:

1. Development of alternative sources - this is essential since half of the problems which exist are due to inadequate water sources. Such alternatives as the development of new intake points, additional well capacity, construction of new reservoirs, importing of water from another system or jurisdiction all need to be considered.
2. Expansion of treatment capacity
3. Increased the pumping capacity
4. Increased finished storage capacity
5. Regionalization
6. Water conservation

Beyond those problems for which there are available solutions there are also outstanding issues, according to the SWCB which present possible obstacles to the provision of adequate water supplies. First, how do we supply water to "water short" areas and what should be the state government's role in resolving this issue. Second, no policy has been developed with respect to minimum in-stream flow. The 1981 legislation directed the SWCB to incorporate the minimum in-stream flow rates into its planning process. After having looked at the issue in house and using consultants the SWCB has concluded that this issue transcends simply establishing minimum flow rates but rather is a question of how do you achieve a balance among competing interests such as public water systems, industry, agriculture versus the public stewardship responsibility to preserve aquatic life and habitat and provide public recreational opportunities. In the absence of a state policy or specific statutory authority the decision as to how water will be allocated among users, even in drought situations remains problematic. The third issue is the increased burden placed on smaller "disadvantaged" communities to finance their water facilities. The General Assembly passed the Water Supply Revolving Fund but did not appropriate any funds. If the Fund was to be capitalized it would assist communities in meeting their water supply needs.

A fourth issue is how do we protect water resources in developing areas. Such protection will assure that the quality of the resource will not be degraded and future demand for water would be accommodated. The final issue discussed by officials of the SWCB is their inability to evaluate the condition of the 1100 small (less than 10,000 GPD) public water supply systems; although it was stated that many of these systems are substandard due in large measure to a lack of funding.

The legislation which directed the SWCB to develop the basin plan also authorized the creation of an advisory committee to assist in developing these plans and programs. The eighty-member State Water Plan Advisory Committee (SWPAC) which was created in 1983 presented its final recommendations on the water supply plans to the Commission. Mr. Louis Guy, acting chairman of the State Water Plan Advisory Committee indicated that the plan makes a major contribution in its documentation of the amount of surface water available in different basins and how much off stream use is currently taking place and can be expected in the future. But it fails to adequately assess both the stream flow which is needed to protect stream uses during a drought and the subsurface resource (groundwater). In addition, according to Mr. Guy the plan does a "good job of discussing problems", but proposes few solutions, as directed by the legislation. The State Water Plan Advisory Committee recommended that the Commission take the following actions:

1. Remove the irrigation "loophole" in the Groundwater Act;
2. Since only one-half of the significant irrigators have reported voluntarily, leaving a large gap in water use data, it is important that reporting by irrigators be mandatory;
3. Establishment of a comprehensive withdrawal permit program; and
4. Water utility powers of eminent domain should include the protection of future reservoir sites.

B. Groundwater Management Strategy

Approximately 80% of Virginians use groundwater to meet some of their daily needs. For 25% of the population groundwater is their only source of drinking water. Sixty-six of 95 counties depend on groundwater as their primary source of drinking water. The importance and vulnerability of this resource led to the creation of a steering committee composed of state agency representatives to study how Virginia has protected its groundwater and what more needs to be done. The steering committee found that although "Virginia laws are as strong as any in the country in providing statutory protection for groundwater," there is "inadequate guidance for agency personnel and others in how to interpret and apply these laws."

Officials of the SWCB presented an overview of the new groundwater protection strategy to the Commission. It should be noted that this strategy focuses solely on water quality and is regarded as a first stop in a continuing effort to protect Virginia's groundwater resources. The strategy recommends the following:

1. Top priority be assigned to six potential sources of groundwater contamination: underground storage tanks, landfills, waste lagoons, septic tanks, and pesticides and fertilizers;
2. The SWCB be given adequate resources to develop and implement an effective underground storage tank program;
3. A handbook be developed which describes the groundwater protection requirements of the various regulatory programs;
4. Increased cooperation among agencies in the collection, management and use of groundwater data;
5. Groundwater protection should be a goal of local land use planning and decision making.
6. Specially tailored groundwater training should be developed for local and state official, well drillers, pesticide applicators and sanitarians;
7. Strengthening of the existing permit program to increase groundwater protection provisions (NPDES permits, no discharge certificates, landfill permits, RCRA permits and water well construction permits); and
8. Continued monitoring of state groundwater protection programs.

C. Protection of Private Water Supplies

The 1987 Session of the General Assembly passed House Joint Resolution No. 324 requesting the State Water Commission to study the quality of groundwater in Virginia. Specifically, the Commission was directed to consider ways to protect the quality of private drinking water supplies and the relationship of groundwater management to the quality of drinking water.

1. Public systems

State law provides for the regulation of public drinking water supplies (§ 32.167 through 32.1-176). A public water supply (waterworks) is one which provides water for drinking or domestic use to (i) the public, (ii) at least fifteen connections, or (iii) an average of twenty five individuals for at least sixty days a year. The Health Department regulations include technical criteria for the design and operation of waterworks as well as water quality and quantity criteria. Specifically, the regulations, by statute, are to include: (i) minimum health and aesthetic standards for pure water; (ii) minimum standards for the quality of water which may be taken into the system, (iii) criteria for siting and construction, (iv) inspections, examination and testing of raw or finished water and (v) submission by owners of samples of water for bacteriological, chemical, radiological, physical or other tests.

The analysis of water samples may be prepared by the Division of Consolidated Laboratory Services (DCLS) or a private laboratory certified by Division of Consolidated Laboratory Services under an Environmental Protection Agency national certification program. According to Mr. Eric Bartsch, Director of Water Programs for the Health Department, prior to FY 1985 the Division of Consolidated Laboratory Services performed free analyses for all public water supply systems. The Division of Consolidated Laboratory Services budget currently provides for the free water analyses of only publicly-owned systems. Investor owned systems must pay for such analyses. The Division of Consolidated Laboratory Services charges $10 per sample for bacteriological analyses and $350 per sample for a complete chemical, organic and inorganic analyses. The complete chemical analyses does not include trihalomethanes and volatile chemicals which would increase the cost by $25 and $150 respectively. Radiological analyses are performed free of charge.

2. Private water supplies

A 1985 survey by the Virginia Water Resource Research Center at VPI-SU revealed that between 300,000 - 550,000 Virginians know someone whose well has been contaminated by bacteria or chemicals. Currently, the quality of water a consumer drinks from a non-public drinking water system is unregulated, except for a bacteriological test at the time of construction for those wells falling under the Sewage Handling and Disposal Regulations. These regulations which contain standards for the siting of wells prior to the issuance of septic system tank permit do require that the water be disinfected, if bacteriological limits are exceeded. No other water quality inspections are made by the local health department. The regulations being proposed pursuant to the Private Well Construction Act contain only criteria on the location and construction of wells. They do not deal with water quality or quantity.

The Commission which held three public hearings on the protection of private water supplies received testimony which detailed incidents of contamination of private wells from such sources as landfills, failed septic systems, underground storage tanks, industrial and agricultural chemicals and pesticides, mining activity and salt water intrusion. The comments and recommendations received by the Commission reflected many of the concerns documented by the new groundwater management protection strategy. There was recognition by most speakers that what is done on the land ultimately affects the quality of the groundwater. The public's comments emphasized that the problem of contamination must be met with a combination of complimentary approaches which should include the establishment of groundwater and surface water quality standards; the importance of land use controls restricting certain activities on a "critical" aquifer recharge zones; the selection of waste sites based on hydrogeologic and soil characteristics; the regulation by local government of underground storage tanks not currently being regulated by the federal or state government; the monitoring of the quality of drinking water; and public education.

The Commission received the following specific recommendations:

- That additional financial and technical resources be provided to local governments for collection of groundwater data and specifically for the development of groundwater vulnerability maps.
- That the state require the testing of all new wells and either share the costs of such analysis, or provide the analysis at cost to the homeowner. Officials of the Health Department cautioned the Commission that such a requirement would result in considerable expense. The Department issues about 29,000 on site septic permits per year and the vast majority involve the construction of a private well along with them. If the state was to bear the cost it would result, according to the Health Department, in an annual expenditure of $10.1 million for chemical analyses and $14.5 million if volatile organics are included. The annual costs for one bacteriological sample per new well would cost $290,000. These estimates were disputed by officials of Prince William County who indicated that they were able to contract for testing which would include volatile organic chemicals and other contaminants for $85 considerably less than the $500 paid by the Health Department.
- That there be testing of existing wells as part of a real estate transfer. It is contended that testing at the time of transfer would enable the new owner to document any contamination from a possibly failed septic system.
- That the General Assembly should amend those statutes which grant local government land use and zoning authority so that they reflect the importance of protecting groundwater. Several local governments and the Virginia Association of Counties recommend that the protection of groundwater specifically be recognized as an element in the comprehensive plan and zoning ordinances. Other localities are concerned with changing the planning language with regards to groundwater protection. They take the position that there is already such authority to include groundwater in the comprehensive plan since groundwater is a "natural resource" which is one element to be included in the plan (§ 15.1-447).
- That the Virginia Code be amended to require that the issuance of a building permit be contingent upon a finding by the Health Department that a safe, adequate and proper water supply is available to such a building.

D. Reporting of Water Withdrawals by Irrigators

Since 1982 the Virginia Cooperative Extension Service has been assisting the SWCB with the voluntary irrigation use reporting program. Beginning in 1986 the data gathering effort was intensified in response to House Joint Resolution 161 which requested the Extension Service agents to assist the SWCB and farmers in the reporting of water withdrawals for irrigation. The response rate by farmers last year was a disappointing 45%. According to the extension agents over half of the irrigators who should have reported simply refused. This year the VPI-SU Extension Service has instituted several changes aimed at simplifying the reporting process and making the program easier to administer. For example a uniform reporting form (Appendix B) has been made available to all irrigators. In addition, this year the reporting deadline was extended to January 15, 1988. In spite of these procedural changes, the agents are not optimistic that this year's effort will generate a higher level of compliance. The Commission would encourage those irrigators to report their usage, since this is the one element in the water supply plan which has not been satisfactorily documented.

III. RECOMMENDATIONS

The Commission endorses the concept of placing ground water protection on an "equal footing with surface water, storm water and flood water", as recommended in the Ground Protection Strategy. The Commission therefore, supports legislation which would amend current law to enable local governments to include the protection of ground water and surface water in their comprehensive plan and zoning ordinances.

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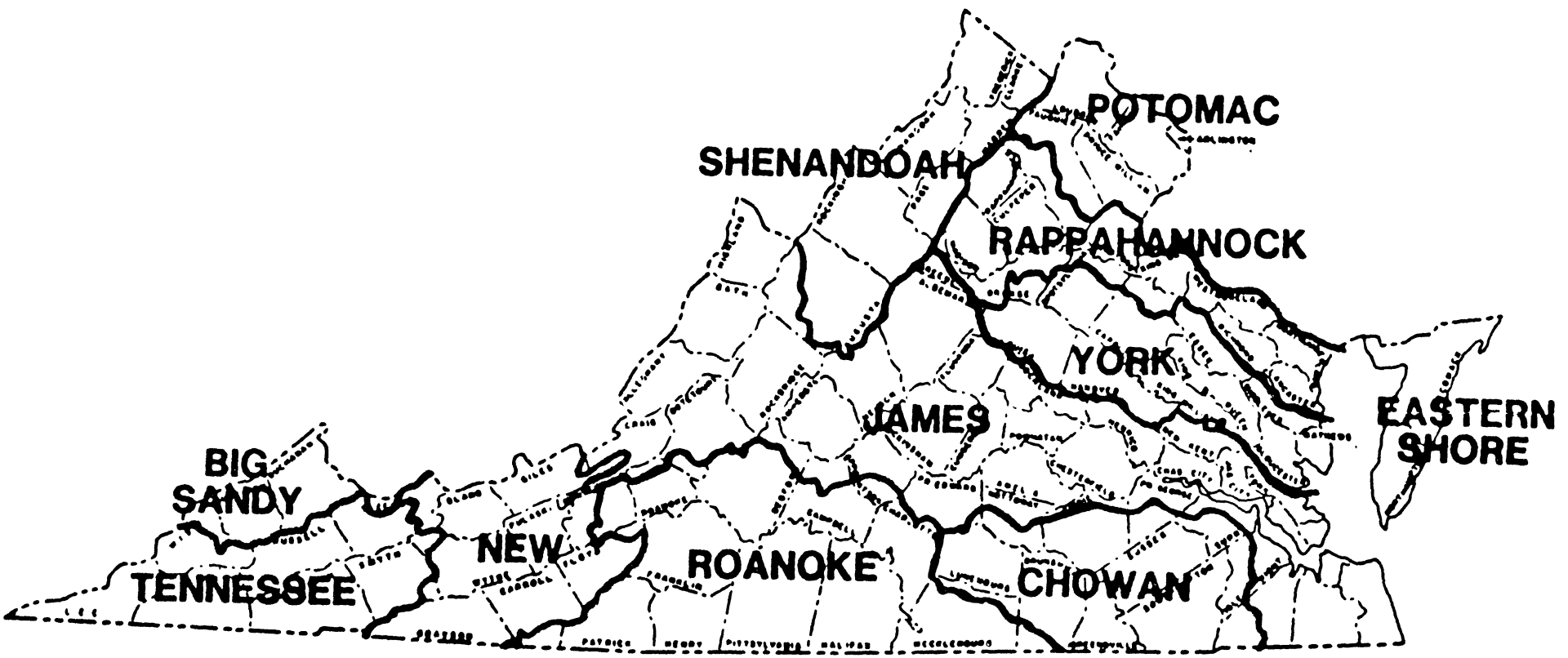
WATER SUPPLY PLANNING AREAS

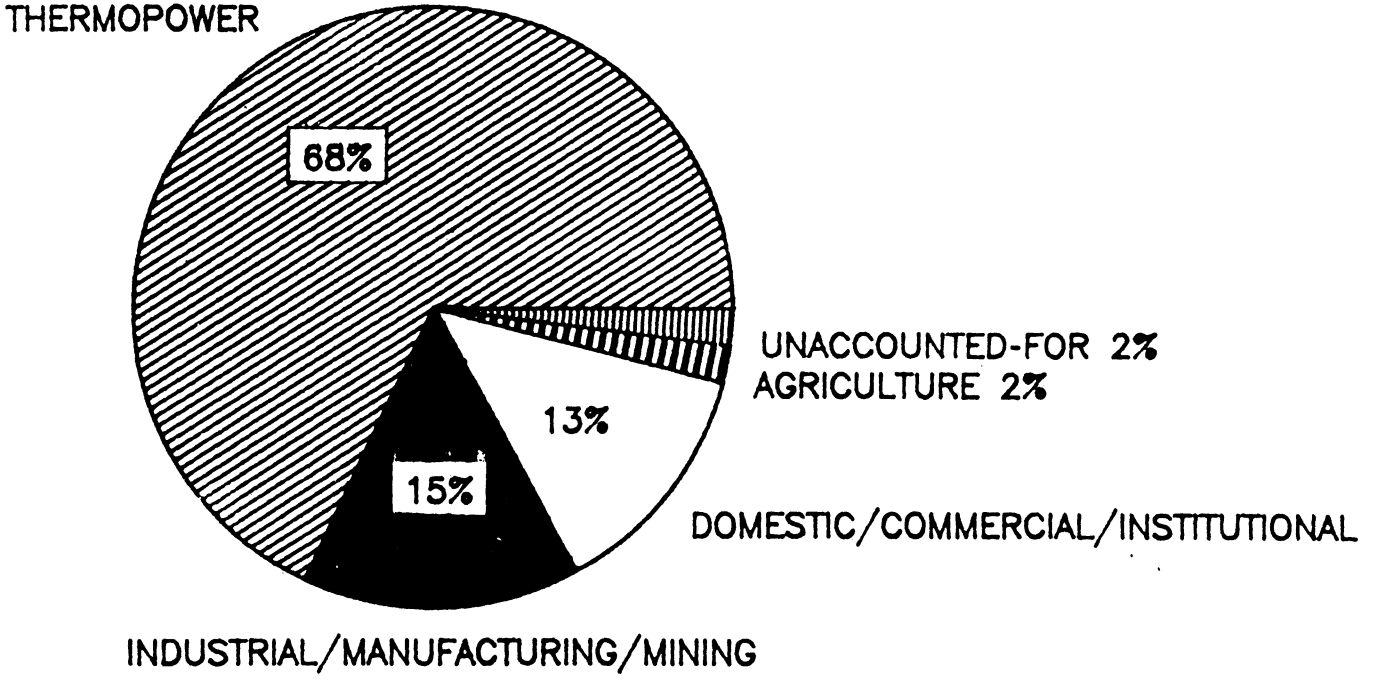


WATER SUPPLY SOURCES AND AMOUNTS

SOURCE	MILLION GALLONS AVERAGE DAY	MILLION GALLONS EXTREME DROUGHT DAY*
RIVERS AND STREAMS	27,350	1,510
GROUND WATER	190	190
RESERVOIRS	520	520
TOTAL	28,060	2,220

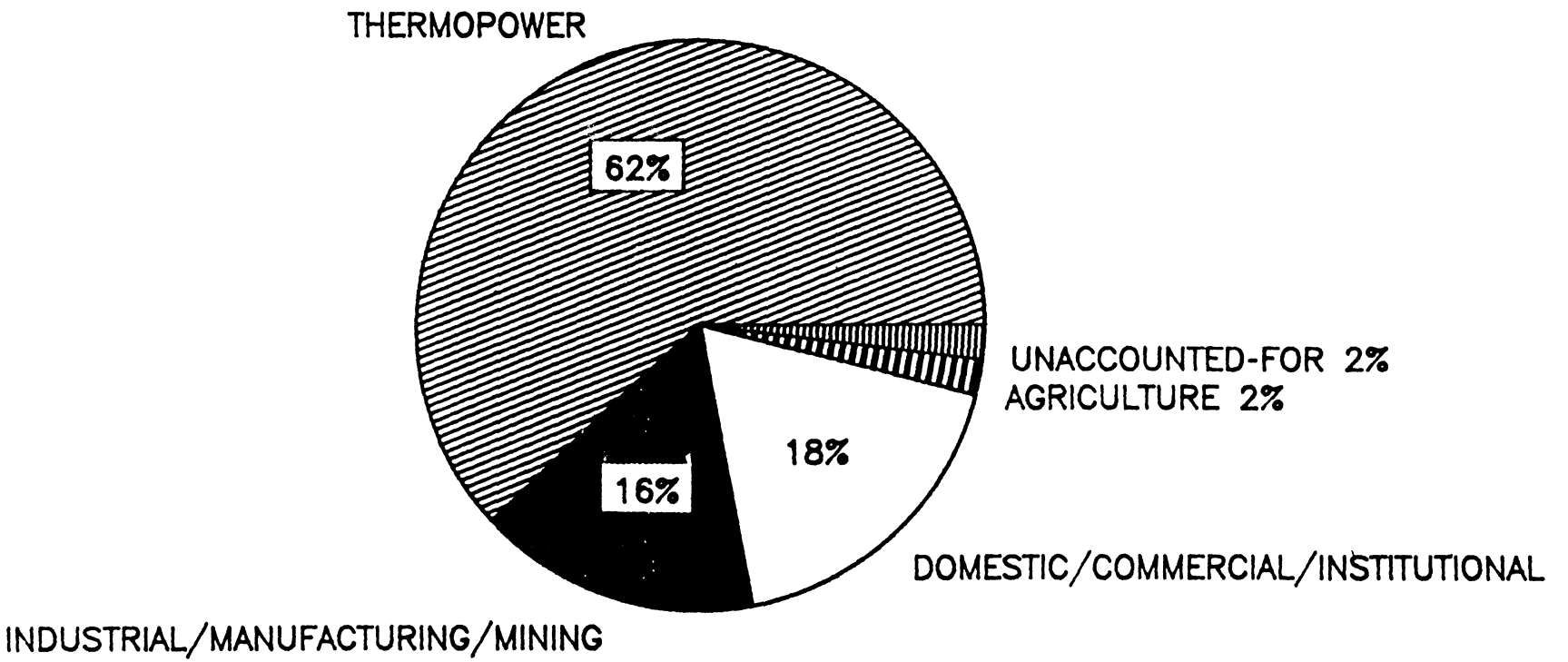
*RECORDS DO NOT INDICATE THAT THIS HAS EVER OCCURRED, AND THE LIKELIHOOD THAT IT WILL IS EXTREMELY REMOTE.

TOTAL OFFSTREAM WITHDRAWALS (FRESH WATER) BY CATEGORY OF USE (1980-1986)



4010 MILLION GALLONS PER DAY WITHDRAWN

TOTAL OFFSTREAM WITHDRAWALS (FRESH WATER) BY CATEGORY OF USE (2030)



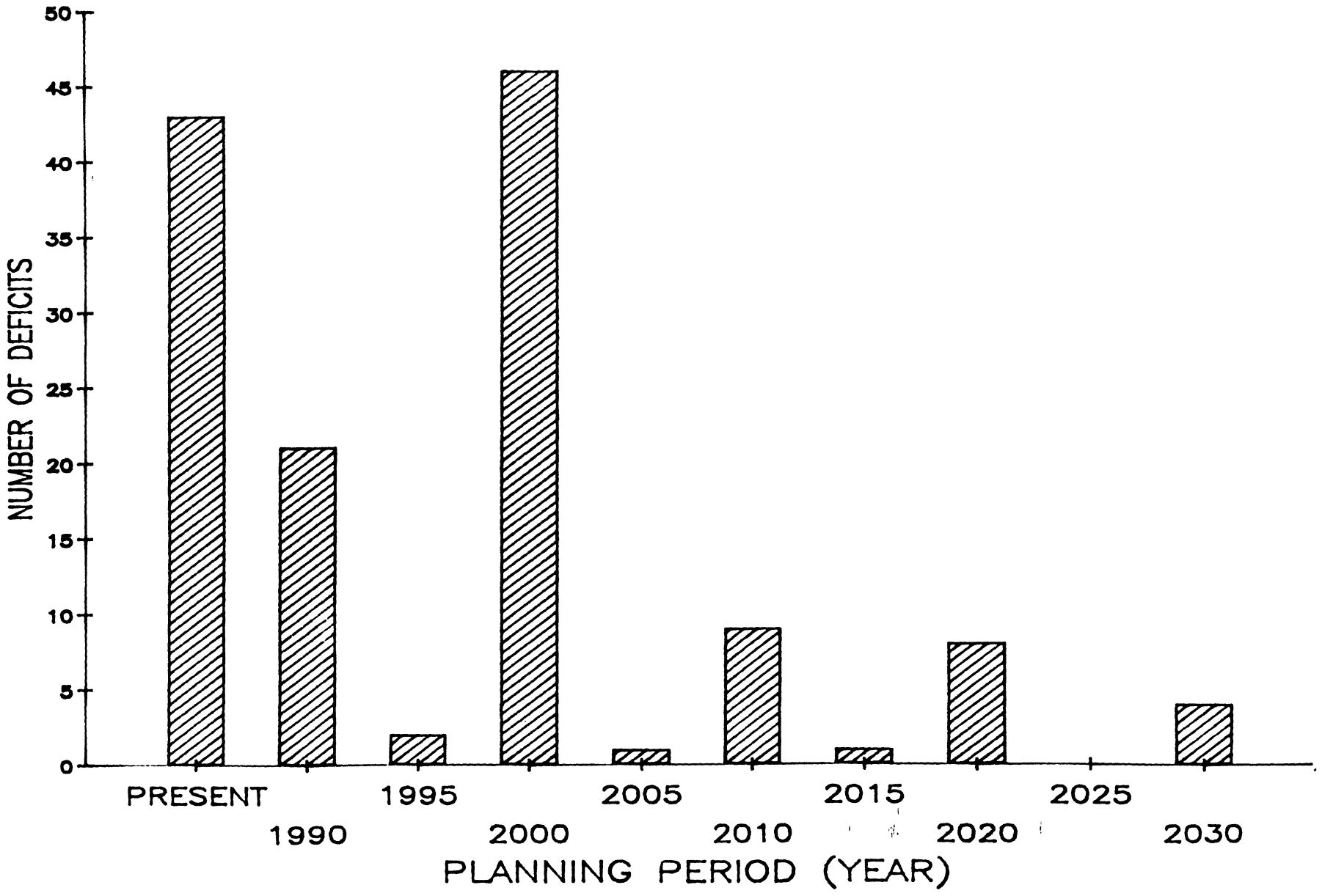
4460 MILLION GALLONS PER DAY WITHDRAWN

APPENDIX A CHART 5

CURRENT AND PROJECTED WATER DEMAND, MGD

	CURRENT (1980–1986)	PROJECTED (2030)	PERCENT INCREASE
DOM/COM/INST.	521	786	51
IND/MAN/MIN.	611	710	16
AGRICULTURAL	59	111	88
THERMOPOWER	2,753	2,753	0
UNACCOUNTED–FOR	66	100	51
TOTAL	4,010	4,460	11

PROJECTED CHRONOLOGY OF DEFICITS FOR WATER SUPPLY SYSTEMS



1987 VIRGINIA IRRIGATION WATER USE REPORTING FORM

Name of Owner _____ Owner Phone # _____

Name of Operator _____ Operator Phone # _____

Farm/Business Name _____ ASCS Farm # _____

Address _____

_____

County/City Location of Irrigation _____ *(Use a separate* **REPORTING FORM** *to report irrigation water use in another jurisdiction)*

Irrigation Water Use Information

WATER SOURCE # 1: *(See box below for additional information)*

Type of Source*	Source Description**	Number of Acres Irrigated	Major Crop Irrigated

Monthly Water Use (transfer information in "million gallons" from WORKSHEET if used):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

For each water source reported, please select **one** *from the list below and provide description above as indicated.*

*Type of Source	**Source Description
1. River or stream	Name of river or stream
2. Multi-owner/public lake	Name of water body
3. Private farm pond	Approximate storage (acre-feet)
4. Well	Approximate depth (feet)
5. Dug pond	Approximate depth (feet)
6. Public water system	Name of supplier
7. Other	Describe source

Use this side of REPORTING FORM only if you are reporting irrigation use from more than one water source at the same farm/business location.

WATER SOURCE # 2: *(See box on other side for additional information)*

Type of Source* | Source Description** | Number of Acres Irrigated | Major Crop Irrigated

_____ _____ _____ _____

Monthly Water Use: (transfer information in "million gallons" from WORKSHEET if used)

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

WATER SOURCE # 3: *(See box on other side for additional information)*

Type of Source* | Source Description** | Number of Acres Irrigated | Major Crop Irrigated

_____ _____ _____ _____

Monthly Water Use: (transfer information in"million gallons" from WORKSHEET if used)

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

WATER SOURCE # 4: *(See box on other side for additional information)*

Type of Source* | Source Description** | Number of Acres Irrigated | Major Crop Irrigated

_____ _____ _____ _____

Monthly Water Use: (transfer information in "million gallons" from WORKSHEET if used)

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC