

STATE WATER PLAN INTRODUCTION SECTION DRAFT JANUARY 6, 2006

VISION AND PURPOSE

Pennsylvania has abundant and magnificent water resources. These resources should provide the basis for an exceptional quality of life for Pennsylvania's residents, an opportunity for outdoor enthusiasts, an attraction for visitors, unparalleled natural beauty, thriving ecosystems, agricultural prominence, and economic prosperity throughout the Commonwealth. All those with an interest in Pennsylvania have a stake in the use, enhancement, and stewardship of the state's water resources. Indeed, the Pennsylvania Constitution vests a right to pure water and the values of the natural environment in all Pennsylvanians, and imposes a duty to conserve and to maintain public natural resources for this generation and generations yet to come.

In order to achieve this vision, the State Water Plan will offer tools and guidance for all those who make decisions that affect the Commonwealth's water resources or who make decisions based upon the availability of water of adequate quantity and quality. The Plan should be useful to those who wish to locate and to design their projects so that the availability of water resources does not constrain them; those who wish to preserve high environmental quality where it exists and to achieve it where it does not; local governments with planning, conservation, and economic development responsibilities; and Commonwealth and interstate compact agencies. This Plan should serve their needs by providing a qualitative and quantitative description of water resources in Pennsylvania based upon accurate, transparent, and readily accessible data, and guidance on the use of that description and those data in the decisions that face the Plan's users. The Plan is a starting point for considering the opportunities available to Pennsylvanians for managing the state's water resources to achieve our vision for the Commonwealth.

INTRODUCTION TO THE STATE WATER PLAN

The Commonwealth of Pennsylvania has traditionally been seen as blessed with abundant natural resources, and in most circles, as endowed with adequate water to serve its citizens, businesses, and varied industries. Its annual rainfall and multiple snowfalls seem to adequately charge its streams and groundwater aquifers. The water users have not always been kind to these bountiful waters, with history showing strong and recurring evidence of abuses. Now, in the initial years of the 21st Century, the governments and citizens have an opportunity to establish a plan for the future development, conservation and utilization of the waters of the Commonwealth.

It is extremely important to begin to establish a framework for planning certainty with a high degree of flexibility to accommodate the variety of water users, and uses across the Commonwealth. Certainty and flexibility allows decision-makers and users and stakeholders to

have mutually beneficial ways to consider numerous alternatives in order to maximize water use for environmental benefits; for economic and developmental opportunities; for recreational potential to be exploited; for agricultural, poultry, and livestock production to remain viable; and for continued implementation of the traditional, domestic uses we all rely upon.

Water provides Pennsylvania with an important advantage in attracting and retaining economic activity, development, agriculture, tourism, and residents. We often think of water supplies in the context of residential development. But that is far too narrow a focus to appreciate the importance of water resources. From power plants to dairy farms to bait and tackle shops, most business in Pennsylvania depends critically on the availability of suitable supplies of water in an appropriate location and of an acceptable quality. Water also lies at the heart of many important recreational and environmental amenities from urban riverfronts to lakes in State Parks to trout streams. These amenities enrich the lives of Pennsylvanians in ways that do not readily translate into an economic measure and that reports on the environmental health of streams or the concentrations of pollutants in rivers cannot capture. These amenities also provide significant economic benefits and may provide untapped economic opportunities.

This Plan, including the State-wide element and the six (6) regional components, represents a beginning, an initial effort, to meet the mandates of Act 220 of 2002, The Water Resources Planning Act, that requires development of a State Water Plan by March 2008 and a subsequent update every five (5) years thereafter. This Plan is not the complete document that some may be looking for. However, this effort, and the Plan, is the start of a process that will lead to more effective water resources planning and management in the Commonwealth. Certain planning elements have been completed on a state-wide or on a regional level to make the future of water resources brighter and more sustainable for Pennsylvania.

This State Water Plan represents the first five years of collaboration to compile information about water quantity and quality in Pennsylvania, as well as information concerning existing uses of that water. The development of the Plan includes an emphasis on soliciting and gathering regional and local recommendations in assessing problems and priorities. The regional and state water planning process is dynamic and represents the continuing hard work of many dedicated individuals and professionals who consistently participated throughout the planning process.

The Plan is intended to provide anyone with an interest in water the information they need to make reasonable and sustainable choices with regard to water resources. It uses as its base a **water budget**. The water budget quantifies how much water comes into a particular watershed by rainfall or from upstream watersheds and how much water is demanded within the watershed. It is to help provide a balance in protecting the Commonwealth's resources in support existing and future growth. And it is to help Pennsylvanian's better understanding their role in preserving and enhancing our quality of life through effective resource management.

THE NEED FOR THE STATE WATER PLAN

From Colonial days, the Commonwealth's waterways have served many and varied purposes - - floating timber to growing cities, transportation by canals for people and cargos, including tons

of coal from the bituminous and anthracite coal fields, power development and cooling of today=s nuclear power plants, recreation including abundant fisheries, whitewater rafting and canoeing, carrying away wastes from our cities and mines, and providing adequate water for domestic water supplies for growing and dependent citizens and communities. All this was done with little concern for the future because of the seemingly abundant and never ending supplies from the Commonwealth=s mountains and valleys. Adding to the feelings of unrestrained availability was the relatively unregulated access provided by the riparian nature of water rights - - frequently permits are not required to access water if you have a stream abutting land or flowing through your property - - unless you are a public water supplier withdrawing water from surface waters.

Most recently drought has adversely impacted Pennsylvania and her communities several times since 1980. Pennsylvania droughts do not seem to cause the widespread, disastrous losses as seen in other parts of the United States. Rather, the impacts are felt locally and regionally. Agricultural and lawn and garden shops interests suffer losses of revenue. Golf courses become parched, while stream flows diminish threatening aquatic organisms and recreational uses. Homeowners became accustomed to parched lawns and lower quality domestic plants beautifying their homes. Numerous new or deepened wells are required. Municipalities, accustomed to a plentiful supply of water expected in the eastern United States, begin to realize their vulnerability to relatively short duration drought periods, coinciding with growth that has occurred over the recent decades and strained some inadequate supply systems. There are restrictions imposed on non-essential uses of water and water supplies are stretched. And then it rains and we return to normal conditions and begin to stress available supplies and sources, again.

In this Commonwealth there is a necessity for increased water supplies to meet growing demands caused by growth and development. Some may suggest that future demands may be curtailed by not providing the water that supports the growth and expansion into new areas. However, livable communities must be able to grow, while sustaining this growth. Community leaders cannot close the doors to a city or county when unanticipated growth occurs. Resources need to be planned and developed to sustain the vitality of communities. New reservoirs for any purpose, much less for water supply, are extremely difficult to plan and develop for a number of factors. A variety of solutions to provide the adequate supplies deemed necessary for a community must be considered, planned, and developed.

[QUALITY, FLOOD CONTROL/FLOODING & STORMWATER DISCUSSION GRAPH
NEEDED HERE]

The future of sustainable growth and industry in the Commonwealth of Pennsylvania hinges on an adequate fresh water supply. Throughout history, civilizations have risen and fallen with the flow of water, and though we are living in a time of unprecedented advances in technology, there is still no way to create water. Variable weather patterns and exponential population increases coupled with demands from a growing manufacturing and industrial sector all affect the requirement for fresh water. Yet despite escalating demand, the worldwide supply of water has remained constant. We drink the same water the dinosaurs drank, and what seemed an endless supply during the prehistoric era is barely adequate to meet today=s burgeoning need. To assure

that our Commonwealth has sufficient water for both present and future needs, three primary action steps must be taken. First, we need to scope out and assess what we have in terms of available water. Second, we must then plan for future uses, and in some cases develop new water sources. Third, we must manage demand and curb waste through comprehensive water conservation programs.

WATER AND PENNSYLVANIA

Since the early days of the Commonwealth, much water has, literally, gone over the dam. Pennsylvania is still seen as water rich - - approximately 42 inches of precipitation per year gives a great sense of water wealth; however, the recurring droughts since the 1980s cause concerns with the availability of water resources to meet future needs of the Commonwealth and her citizens. This amount of rain and snow sometimes result in timing issues in that excesses frequently cause major flooding with resultant costly impacts on citizens and communities. Many miles of Pennsylvania streams are laden with the legacy of past mining - - acid mine drainage with high mineral content that renders the waters useless for human consumption. Industrial water uses led to a variety of water resources impoundments across the waterways to augment supply for canal construction, or employ water dynamics to generate power, or store water for future use, or to provide for streamflow to float timber or cargo boats to growing and demanding metropolises of business and industry in Pittsburgh, Philadelphia or other communities. Water is not always in the location and the quantities deemed needed for today=s demands. Conflicts between users are growing and in this 21st Century more emphasis is being placed on ensuring that flows are available for aquatic organisms that mean much to quality of life issues associated with the preservation of our environment and our water resources.

In the 19th Century, oil and gas were discovered in Pennsylvania. Those natural resources made Pennsylvania the nation's manufacturing center for a century. Water can provide the natural resource base for a similar Pennsylvanian preeminence. People should want to be here. It is a good place to live, to work, and to visit.

The water needs of residences, business, and amenities differ. They may, in fact, conflict. Historical mining practices provide the most obvious example of that conflict. The failure of older coal mining operations to preserve water quality has now made water that is clean enough to use without expensive treatment scarce in some parts of the Commonwealth; one-sixth [check] of the stream miles in Pennsylvania **fail to meet water quality standards** as the result of abandoned mine drainage.

[QUALITY, FLOOD CONTROL/FLOODING & STORMWATER DISCUSSION GRAPH NEEDED HERE, AS WELL WITH MENTION OF LINKAGE TO CHESAPEAKE (AND GREAT LAKES?) CLEANUPS-RESTORATION]

A BRIEF HISTORY OF PAST STATE WATER PLANS

Although water planning dates to colonial times with Pennsylvania being part of the Gallatin Report in 1808 that evaluated the transportation system, including water, of the fledgling United

States. In the early 19th Century Governor Tiner called for a review of the Commonwealth's water resources. It wasn't until 1913 (?) that Pennsylvania undertook its first water resources inventory which resulted in ten reports in 1918. (1923?)

Again in the late 1960's the Commonwealth began a broad water resource planning effort as a component of a national water planning initiative. In 1975 *SWP-1 Planning Principles* was completed which resulted in nineteen basin reports completed in 1983. However, both of these earlier efforts resulted in static documents, providing varied statistics and recommendations for developing a water supply for a growing Commonwealth, but they became, essentially, outdated upon publication. The State Water Plan has not had an update in nearly twenty-five years. The need for a focused effort to enhance Pennsylvania's economic growth and environmental sustainability is essential for our collective future. Act 220 requires the Department of Environmental Protection to develop a new state water plan that will provide inventories of water resources and factors across the Commonwealth, assessments of these water resources and factors, and identification of issues and needs to improve the Commonwealth's water resources for future generations.

“WHEN THE WELL IS DRY, WE KNOW THE WORTH OF WATER”

The admonition from Benjamin Franklin hardly describes enormity of the economic reality of the need for a State Water Plan. Water provides Pennsylvania with an important advantage in attracting and retaining economic activity, development, agriculture, tourism, and residents. We often think of water supplies in the context of residential development. But that is far too narrow a focus to appreciate the importance of water resources. From power plants to dairy farms to bait and tackle shops, most business in Pennsylvania depends critically on the availability of suitable supplies of water in an appropriate location and of an acceptable quality. Water also lies at the heart of many important recreational and environmental amenities from urban riverfronts to lakes in State Parks to trout streams. These amenities enrich the lives of Pennsylvanians in ways that do not readily translate into an economic measure and that reports on the environmental health of streams or the concentrations of pollutants in rivers cannot capture. These amenities also provide significant economic benefits and may provide untapped economic opportunities.

Because Pennsylvania is relatively wet, in most of the Commonwealth, if we avoid foolish location decisions and protect the quality of our existing water, water will be abundant. Indeed, the availability of reliable, high-quality water forms one of the reasons why a person or a business would want to choose to stay in Pennsylvania, to relocate to Pennsylvania, or to visit us. Many of the fastest growing regions of the country are in the desert southwest. Of course the desert is beautiful, but lush green forest and grassy lawns have their attractions, and they are abundant in Pennsylvania. Businesses and farms do not litigate for years over water rights in Pennsylvania.

WHAT IS THE STATE WATER PLAN AND WHO ARE THE USERS?

This State Water Plan compiles information about water quantity and quality in Pennsylvania, as well as information concerning existing uses of that water. The Plan is coupled with a computer-based information tool that allows users to explore very specific new projects.

This Plan, then, dramatically reduces the trouble and expense of predicting conflicts over water resources well in advance. In most locations, there is plenty of water. Projects for new housing, new business, or enhanced recreational and environmental amenities can proceed without having to worry about reliable, high-quality water. Indeed, water is a feature of those locations that one could market to tourists or investors.

But in some locations, the water resource can not sustain every proposed project. New withdrawals from a stream may impair its usefulness for farmers. New development may impair the quality necessary to maintain fish in a stream. In dry spells, the groundwater resource may not adequately serve all of the new residential development that might otherwise be proposed.

The Plan, and its **water budget**, is expected to allow everyone with an interest in any project or any water resource to assess those conflicts inexpensively and early. Therefore, the stunning costs and environmental effects that arise when conflicts surface very late in the planning process can be avoided. Conservation groups and developers, power plants and farmers, hoteliers and manufacturers will not find themselves at loggerheads after large investments of time and money. They can avoid locating inappropriately or in conflict with one another by identifying areas of scarce water resources while plans remain fluid, so to speak.

We intend the Plan to be a practical, useful document, not an exhortation to “do the right thing.” Private actors and governmental agencies each have interests, purposes, and agendas that we do not expect to change with this Plan. However, all of them seek to achieve their goals with a minimum of cost and difficulty. Accordingly, taking water resources into account easily and early will assist all actors. Moreover, by making consideration of water resource issues easier, the Plan should result in better decisions and superior outcomes.

For example, many county and municipal governments have active programs to promote new economic development and many have programs to promote tourism. Any new project they attract may well have water needs, some greater than others. The Plan allows them to focus their efforts on attracting projects or tourism that will not conflict with other existing water uses. So, in some areas, the availability of water would be a significant marketing attribute. In others, the existence of high quality resources would be a feature that would attract tourists and others seeking higher quality of life opportunities. In yet other areas, water resources may be tight, and prudent marketing plans would focus on projects that have limited or no water demands.

The Commonwealth similarly promotes economic and community revitalization through grants and incentives. Again, all parties should know before making decisions whether the proposed project will run the risk of being engulfed in a water resource conflict before the Commonwealth promotes it.

Private parties often pursue projects, whether economic development agencies have recruited them or not. Most projects do not benefit from conflict. If private parties can identify potential disputes over the use of water resources, they can take the likelihood of those disputes into account in deciding whether or how to proceed. Not only will real estate developers, industrial firms, and farmers take this information into account, but so will their lenders and investors,

purchasers of their interests, and all manner of other market participants. By making water resource issues readily accessible, this Plan will enable ordinary market forces to induce private parties to take water resource issues into account without any further governmental intervention.

Not only will the proponents of any given project have access to water resource information through the Plan, but so will opponents. Because prudent private parties will anticipate that those who oppose their project will be able to evaluate the project's implications for water resources, the project proponents will tend to make more conservative, wiser decisions.

While markets may be the most powerful tool available to the Commonwealth to assure environmental quality and economic development, sometimes private parties make decisions that run counter to public policy. Environmental quality and sound land use are fundamental to Pennsylvania. People want clean streams and pleasant waterfronts. They are constitutionally entitled to certain environmental amenities and the preservation of certain public resources in our Commonwealth. Therefore, this Plan has been constructed with the understanding that environmental quality is good in and of itself.

This Plan also proceeds from a deep understanding that environmental quality is critically important to the economic health of this Commonwealth. While people may in good faith dispute whether an environmental *protection* effort makes economic sense in a particular instance, there is no reasonable dispute that the better the environmental *quality* – the purer the water, the cleaner the air, the more robust the ecosystem – the more people will want to live, to work, and to vacation in Pennsylvania. There is no conflict between this Plan's vision of water as *both* an environmental and an economic resource.

To that end, the Plan allows regulators with the principal task of assuring environmental quality or sound land use to have the data and information necessary to make informed decisions and to take water resources issues into account more readily. The Plan will allow local zoning authorities to fulfill their obligations under the Municipalities Planning Code to plan for water quantity and quality and their general obligations to make land use decisions that further the health, safety, welfare, and morals of their communities. It will allow the Department of Environmental Protection, and all other Commonwealth regulators, more consistently and completely to consider the implications of their decisions on water quantity and quality and to fulfill not only their statutory obligations, but the obligations imposed upon them by the Environmental Rights Amendment to the Pennsylvania Constitution.

THE WATER BUDGET

The Plan contains considerable detail and nuance. However, the Plan uses as its base a **water budget**. The water budget attempts to quantify for each watershed of at least fifteen square miles how much water comes into that watershed by rainfall or from upstream watersheds and how much water is demanded within the watershed. Demands come in various forms. Some users of water withdraw water and never return it to that watershed. It may evaporate. It may boil off. It may be incorporated into something else, like a corn crop or bottled juice. Or, it may be discharged into a different watershed.

Other users take water from a stream or groundwater from underlying soil or rock, use it, and then return it essentially to the same place. Many municipal water systems operate in this way, as do power plants that require cooling water that returns to the stream from which it is withdrawn, with some evaporative losses that must be considered in water budgets.

If those were the only demands on water resources in Pennsylvania, almost all of Pennsylvania would have more than enough water to support any conceivable set of uses. However, most streams in Pennsylvania serve other important uses. A stream without water really does not represent the same amenity as a babbling brook or, for that matter, a major river. Cities, towns, state forests, and everything in between are built around waterways. If those streams are dewatered, dirty, and unpleasant, they do not serve an important purpose.

[AGAIN, QUALITY, FLOOD CONTROL/FLOODING & STORMWATER DISCUSSION
GRAPH NEEDED HERE, AS WELL WITH MENTION OF LINKAGE TO CHESAPEAKE
(AND GREAT LAKES?) CLEANUPS-RESTORATION]

Moreover, virtually all streams support aquatic ecosystems. In some streams, those ecosystems are very valuable. Pennsylvania has preeminent fishing resources that are a joy to millions and a livelihood for many. In others, they have an intrinsic environmental value that we discount at our peril. Only in a Dickensian nightmare would one wish more dead streams on Pennsylvania. Aquatic ecosystems require adequate, clean, water, even in dry periods.

Demands for in-stream water have as much importance as demands for residential, business, or agricultural use. Therefore, for most streams in Pennsylvania, the important question of whether the demand for water would exceed the yield of the watershed in a dry period turns critically on how much water of what quality must remain in the stream in order to support the in-stream uses. This Plan attempts to weigh those questions and to provide tools for further consideration in specific instances. Users of the Plan must keep in mind that not only must decisions leave enough water in the stream for the next user downriver, but they must also leave enough water in the stream for all the users who want the stream to thrive biologically and to provide an esthetic and recreational amenity.

Water resource plans struggle with human being's difficulty conceptualizing uncertain events. Rainfall varies from year to year and month to month. Several years of dry weather motivated enactment of the Water Resources Planning Act, and several years of wet weather immediately followed, possibly motivating apathy towards water resources planning and management actions. Resource conflicts first arise in years that are unusually wet or unusually dry. In wet years, poor planning leads to floods. In dry years, poor planning leads to wells that run dry and streams that run low.

The Water Resources Planning Act enjoined this Plan to evaluate whether "demand" exceeded "safe yield" in any watershed. If so, that watershed would become a Critical Water Planning Area. If "demand" approached, but did not exceed "safe yield," this Plan suggests significant attention to avoid the mismatch between the resource and its uses. However, even in an area where "demand" approaches or exceeds "safe yield," much of the time there will be plenty of water. "Demand" will only approach or exceed "safe yield" in exceedingly dry periods. Users

of the Plan must take care to understand what the data reported here and in the associated budget tool really say about *how often* and *in what circumstances* water resource conflicts arise. Often, that understanding provides the key to resolving the issue.

This Plan is an optimistic document. It is a force for “yes,” not “no.” It sees a beautiful, vibrant Pennsylvania using water to achieve even higher environmental quality, even stronger economic growth, and even more robust communities. It offers a way to do more and to do better with Pennsylvania’s resources, not less. We urge it upon all Pennsylvanians who care about their surroundings, their lives, and their livelihoods as a useful, working document.

STATE WATER PLAN GUIDING PRINCIPLES

In order to develop this new state water plan a setting of guiding principles has been employed to prioritize and establish actions required by the plan. The following principles provide a base for planners, readers and implementers of the plan to have a starting point and common ownership for the plan and the waters of the Commonwealth, and to implement the **Vision and Purpose** defined above:

- (1) As trustee of this Commonwealth’s water resources, the Commonwealth has a duty to preserve the natural, scenic, historic and esthetic values of the environment and to conserve, protect, manage and maintain those resources for the benefit of all the people, including generations yet to come.
- (2) Water resources are both finite and renewable assets that must be used and conserved responsibly, as the Commonwealth and its local governments have a vital interest in ensuring that these water resources are available for the present and future use and enjoyment of its citizens.
- (3) The control and prevention of pollution is directly affected by the quantities of water in said streams and the uses to which such water may be put, requiring integration and coordination of the planning for both quantity and quality.
- (4) Planning for the development, use, conservation, and management of adequate supplies of water is necessary to minimize the effects of recurring periods of drought, the increasing use of water, and an overuse of water which may threaten to create water shortages.
- (5) Severe shortages and overuse may render water resources incapable of meeting essential needs, may cause conflicts between diverse users of the common resource, may disrupt or damage economic activities and may contribute to environmental degradation, pollution and unsanitary conditions, all of which are detrimental to the health, safety, and welfare of the people of this Commonwealth.
- (6) The Commonwealth is subject to frequent flooding, that dictates inclusion of storm water and floodplain management considerations in a properly developed water plan and integration of these waters as part of the waters available in the Commonwealth.

(7) The most practicable accommodation and balance among multiple water uses will assure the greatest benefits to the citizens of this Commonwealth for municipal, domestic, industrial, commercial, agricultural, navigation, energy development and production, recreation, water-quality maintenance and conservation of fish and wildlife purposes.

(8) The preservation of stream flows and water resources to protect stream ecology, aquatic organisms and water-related environmental values is essential to carry out the Commonwealth's trustee responsibilities and must be assured when providing for reasonable and beneficial water withdrawal and non-withdrawal uses.

(9) The water resources of the Commonwealth, on or beneath the surface of the ground, are interconnected and part of a single hydrologic resource that can be used conjunctively, thus dictating a coordinated and comprehensive approach to the planning process to avoid conflicts between competing users, to encourage investment and economic development, and to ensure the most efficient utilization of the water resources of this Commonwealth.

(10) Comprehensive water resources planning and management must rely on accurate information on water availability, and present and anticipated water use and demand in order to identify resource shortfalls, potential conflicts and areas requiring special management, and to recommend and implement programs and actions needed to address identified concerns.

(11) Comprehensive water resources planning should consider region-specific needs and conditions, and vest planning authority in regional interests, when and if these interests have the technical and science-based capability to conduct responsible planning at the appropriate scale.

(12) Comprehensive water resources planning must distinguish between short-term and long-term conditions, impacts, needs and solutions to ensure appropriate and cost-effective responses to water resources planning issues, including those related to water resources emergencies.

(13) Comprehensive water resource planning should provide for a wide variety of current and future water uses, while providing flexibility to encourage, promote, and facilitate independent efforts by agricultural, municipal, domestic, public water supply, commercial, energy development and production, and industrial users of water to implement reasonable conservation practices and measures that would not otherwise be required.

(14) The conservation of water resources reduces the impact of withdrawals, diversions and consumptive use upon water resources, while providing a degree of drought protection that may delay or eliminate the need for construction or expansion of capital projects, and is a demand management tool available to all water resources users.

(15) The public interest requires that allocated water resources which are not used or fully developed be available for allocation and use by others, and that water rights holders exercise due diligence in implementing permitted allocations and withdrawal uses.

(16) Close coordination and cooperation among federal, interstate, state and local agencies and public and private organizations in matters relating to the water resources of this Commonwealth are in the public interest.

This plan is a first effort to begin implementation of these principles while setting the stage for future developments and updates to address the individual issues and needs identified in this effort. This 2008 version of the State Water Plan is only a beginning. It begins the data inventory and assessments required by Act 220, but it is not the end. It is not the panacea for Pennsylvania's water woes. Please join us in finding the solutions over the next several years and next several updates. Together we can set the plans in motion for better water management for future generations.

OVERARCHING GOALS AND OBJECTIVES OF THE STATE WATER PLAN

This renewed planning effort to develop a flexible State Water Plan for the wise management of the Commonwealth's water and related land resources to meet the present and future needs of the people of Pennsylvania, and to improve the quality of life provides guidance and opportunities designed to implement the above guiding principles and to:

- (1) plan for the quantity and quality of adequate water to meet present and future needs, while protecting the environment, and assuring the public health, safety, and welfare;
- (2) create an accessible system to help ease water management decision-making;
- (3) serve the purposes of its users by providing well-documented, reliable data that are accessible and in a format users can employ;
- (4) consider federal, state, and interstate water resources policies, plans, objectives, and priorities, including those identified in statutes, regulations, compacts, interstate agreements, or comprehensive plans adopted by federal, state or local agencies or compact basin commissions;
- (5) encourage best conservation and management practices to avoid harm to water resources and to promote continued economic benefit, abundant natural resources, and a high quality of life for the citizens of the Commonwealth;
- (6) engage and educate all stakeholders in the Commonwealth's water resources about the conservation and enhancement of these resources; and
- (7) utilize water and related land resources of the Commonwealth toward achievement of the State's social, economic, and environmental goals.

SPECIFIC GOALS AND OBJECTIVES:

- I. Water Availability
 - i. Water Supply

Goal: Water supplies of adequate quantity and quality to meet short-range and long-range needs.

Objectives:

- a. Develop water resources to assure adequate supplies during water shortages and droughts, as well as other possible emergencies
 - b. Identify feasible alternatives (e.g., surface water versus ground water, individual development versus regionalization, single-purpose development versus multiple-purpose development, etc...) taking into account physical, social, economic, and environmental factors, to make possible selection of practicable solutions
 - c. Encourage reuse of water and the development and use of new technology.
 - d. Consider the implications of transfers of water between watersheds.
- ii. Water Conservation

Goal: Develop and conserve water and related land resources to meet residential, municipal, industrial, agricultural, electric power, navigation, recreational and environmental protection requirements, and to provide flood damage reduction and water necessary to meet water quality management requirements.

Objectives:

- a. Consider the extent to which particular technologies for sustaining this resource are cost-effective and available for use to help fulfill the vision of the State Water Plan and should be encouraged
- b. Stress conservation measures that help ensure the future availability of water resources

iii. Instream Flow

Goal: Protection and restoration of uses, both natural and human, including existing and designated uses, that depend upon instream flows

Objectives:

- a. Determine water availability, with consideration for maintenance of those characteristics of stream hydrology that are supportive of flow-dependent natural and human uses
- b. Continue research to identify the characteristics of stream hydrology that best support flow-dependent natural and human uses of water and to identify the relationships between those characteristics and uses
- c. Identify and implement projects and programs that will protect or enhance the characteristics of stream hydrology that support flow-dependent natural and human uses of water
- d. Develop educational materials and programs to inform the public of the importance of instream flow protection

II. Water Quality Management

i. Water Pollution

Goal: Prevent pollution of the waters of the Commonwealth, and reclaim and restore to a clean, unpolluted condition all presently polluted waters, so that probable and planned water uses will be protected at all times.

Objectives

- a. Consider both the quality and quantity of water resources, including the effect of water quality on water availability and the effect of water quantity on water quality
- b. Consider surface and ground water problems created in the past and measures that may be appropriate and available to improve the integrity of these impaired resources for the future.
- c. Promote the protection of sources of public drinking water supplies from pollutants
- d. Develop and institute programs to control and reduce the amount of (acid) mine drainage entering the streams of the Commonwealth from abandoned surface and subsurface mines and
- e. Establish water quality standards designed to protect all probable users of the Commonwealth's waters.
- f. Provide for development of water quality management programs, which are designed to protect and conserve the Commonwealth's waters by way of innovative wastewater management, storage, and collection systems that are consistent with the Commonwealth's policies related to best management practices, smart growth, and infrastructure investment.
- g. Identify and develop institutional arrangements for implementation of regional or basinwide water quality plans
- h. Develop financing methods and programs for the provision of adequate present and future water management facilities and devices.
- i. Provide a basis for allocation of grant funds and for enforcement of pollution control laws.
- j. Control pollution from non-point sources, such as sediment and agricultural wastes, and prevent pollution incidents by requiring adequate product and waste handling safeguards.

ii. Wastewater

Goal: Minimize the effects of wastewater pollution on the Commonwealth's waters

Objectives:

- a. Consider opportunities presented by treated wastewater to replenish natural water resources and to augment water supplies

iii. Water Conservation

Goal: Reduce/eliminate unnecessary water use

Objectives

- a. Emphasize pollution prevention strategies and technologies

- b. Consider the extent to which particular technologies for sustaining this resource are cost-effective and available for use to help fulfill the vision of the State Water Plan and should be encouraged

III. Recreational Opportunities *(could be folded into Economic Development Category)

i.

Goal: Adequate water and related land resources to meet present and future water-oriented and water-enhanced recreational needs.

Objectives:

- a. Promote the preservation of the natural and scenic beauty of areas adjacent to certain wild and scenic water areas and streams for the use and enjoyment of present and future generations for aesthetic enjoyment, as well as for tourism industries such as those that promote picnicking and camping.
- b. Ensure adequate water for fishing, boating, swimming, and other recreational activities.
- c. View recreation as primarily an environmental, economic, social, and educational concern.
- d. Determine the geographic priorities in order to maximize benefits for the greatest number of citizens.
- e. Provide adequate fishing and boating opportunities by development of access areas and by obtaining easement on, or purchase of, valuable land and/or impoundments from private owners.
- f. Coordinate the activities and the responsibilities of Federal, state, local, and private entities.
- g. Coordinate water-related outdoor recreation planning with overall land-use planning, of which it is an integral part.

IV. Stormwater Management/Flooding

i. Stormwater Management

Goal: Reduce and control stormwater runoff to surface waters

Objectives:

- a. Consider opportunities presented by stormwater to replenish natural water resources and to augment water supplies
- b. Assess floodplain and stormwater management problems

ii. Protection of Flood Prone Areas

Goal: Mitigation of existing flood damage problems, and minimization of future flood damages.

Objectives:

- a. Assess floodplain and stormwater management problems
- b. Establish a prioritized list of flood control needs for the purpose of guiding flood control investments.
- c. Identify feasible alternatives (e.g., upstream versus downstream control and/or structures, single-purpose versus multi-purpose, permanent solutions versus emergency solutions, structural measures versus non-structural measures, etc.), taking

into account physical, social, economic, and environmental factors, to make possible the selection of practicable solutions.

- d. Promote sound flood plain management and assist in integrating flood plain management with local land use management.
 - e. Advocate and apply a basin-wide system approach to flood damage reduction measures.
 - f. Stress the interrelationship between traditional State-Federal flood control measures and urban storm drainage.
- iii. Infrastructure

Goal: Ensure that adequate infrastructure is in place in areas of significant stormwater runoff to effectively manage the water to prevent flooding and associated problems.

Objectives

V. Land Use

i. Smart Growth and water resources issues

Goal: Protect water resources from overburden due to the unwise development of land; including inadequate drinking water supplies, stormwater runoff due to increased impervious surfaces, and conflict between water users in areas zoned inappropriately

Objectives:

- a. Educate local officials about the existing tools they can use to manage land use decisions and the impact of their decisions on water resources
- b. Acknowledge that private and public decisions involving or affecting water resources are made under existing law and that the Plan will not change existing law. This is true of every goal in the document. Not sure of its particular significance here.

ii. Infrastructure

Goal: Assure that areas designated for infrastructure improvements are zoned accordingly and are consistent with Smart Growth policies

Objectives:

- a. Improve the integration of land use planning and infrastructure expansion to guide growth into the most desirable areas and protect rural, agricultural, and natural lands

VI. Economic Development

Goal: Promote the economic benefits of available water resources

Objectives:

- a. The Plan should identify opportunities for water resources to be used to encourage and to promote environmentally sound economic growth

VII. Homeland Security/Emergency Management

Goal: Protect water resources in areas that are prone to natural and or human-induced disasters

Objectives:

- a. Improve emergency management planning
 - i. Ensure adequate drinking supplies in case of emergency
 - ii. Protect sensitive water resources from threats of terrorism and natural disasters

VIII. Education/Outreach

a. Public Officials

Goal: Educate public officials about the State Water Plan and tools they can use to plan for water resources so that local plans are consistent with the State Water Plan

Objectives:

- a. Work with DCED, PSATS, PSABS, CCAP and other organizations to develop and implement training programs for municipal officials, municipal solicitors, and municipal engineers to ensure consistency with the State Water Plan

b. Public at Large

Goal: Educate public about the benefits of the State Water Plan, water use, and water conservation.

Objectives:

- a. Develop Technical Assistance Center
- b. Hold public meetings to educate the public about the State Water Plan
- c. Work with Public Participation subcommittee to conduct outreach activities that inform the public about the State Water Plan

c. Water Users

Goal: Educate water users about the wise use of water resources and the benefits water resources provide to them

Objectives:

- a. Work with industry groups and trade associations to educate water users about water conservation and economic development opportunities that exist in areas with abundant water resources

IX. Interagency Coordination

i. Policies/Regulations

Goal: Ensure that state and local agencies develop policies and regulations in a manner that is consistent with the goals of the State Water Plan

Objectives:

- a. Hold interagency meetings on a regular basis
- b. Review and evaluate proposed statutes, regulations, and policies that would impact water resources

- c. Suggest changes in water laws and institutional arrangements deemed necessary to assure the adequacy of present and future supplies and the equitable distribution thereof.
- ii. Projects that impact water resources
 - Goal:** Ensure that state and local agencies implement projects in ways that are not inconsistent with the state water plan
 - Objectives:**
 - a. Discuss projects at agency coordination meetings
 - b. Ensure consistency provisions in regulations and/or Department policies are upheld
- iii. State funding
 - Goal:** Ensure that state agencies do not fund projects that are inconsistent with the state water plan
 - Objectives:**
 - a. Review grant requests to be sure projects will not conflict with the State Water Plan