APPENDIX C

American Planning Association Policy Guide on Water Resources Management

INTRODUCTION AND FINDINGS

Water is a finite resource. Although three-quarters of the earth is covered with water, 97.6 percent our water is salty and 1.9 percent is frozen into the polar ice caps. This means that only about half a percent of our planet's water resources is fresh water. Of these fresh water resources, 0.02 percent is found in rivers, lakes, and streams while the rest, 0.48 percent, is groundwater. These water resources are used for water supply, ecological, recreational, navigational, and waste disposal purposes, and these diverse uses are currently managed under a large number of federal, state, and local laws.

The U.S. Geological Survey (USGS)—in its report, *Estimated Use of Water in the United States in 1995* (Circular 1200, 1998)—estimates that the total use of water (both fresh and saline) in the U.S. was around 402,000 million gallons per day (mgd) in 1995, about 2 percent less than the Survey's 1990 water-use estimate and 10 percent less than its 1980 estimate. This decline in water use occurred even though the nation's population increased 16 percent from 1980–95. Much of this water is used for thermoelectric power generation, which had declined from its 1980 peak use of 210,000 mgd to 190,000 mgd in 1995. Industrial water use (29.1 mgd in 1995) also declined 3 percent from 1990-95, a trend the USGS attributes to the more efficient production technologies used by new industries, more industrial water recycling, and changes in pollution laws.

Total irrigation withdrawals (134,000 mgd in 1995) increased from 1965 to 1980, but then gradually declined from 1980 to 1995, dropping 2 percent from 1990-95. Although the number of irrigated acres (around 58 million) remained fairly constant in the U.S. from 1980-95, irrigated acreage during this period declined in the 19 western states at the same time it increased in the more humid eastern states. On a per-acreage basis, average irrigation water use in 1995 was about 2.1 acre-feet, less than the 2.2 acre-feet average in 1985 and well below the 1975 and 1980 average of 2.5 acre-feet. Irrigation withdrawals vary not only by such factors as the amount of rainfall, energy costs, farm commodity prices, application technologies, and conservation practices, but they also vary by region.

The USGS notes that the only two water uses showing continual increases from 1950 to 1995 were the "Public Supply" and "Rural Domestic and Livestock" water-use categories. Although public supply withdrawals (40.2 mgd in 1995) increased 4 percent from 1990-95, the nation's population increased by 7 percent during this same five year-span, so per capita public supply water use actually declined from 184 gpd in 1990 to 179 gpd in 1995 (a trend that the USGS attributes to increased water conservation). The 13 percent increase in rural water use (8.89 mgd in 1995) is attributed to increases in livestock withdrawals; rural (self-supplied) domestic withdrawals were about the same in 1995 as they were in 1990.

It is often difficult to accurately assess and forecast the complex interrelationships between groundwater and surface water. This means the impacts that development will have on the quantity or quality of one water resource cannot be assessed without also assessing its impacts on all other water resources. For example, increased water demand may force aquifers to be overpumped, an action that not only leads to the drilling of deeper wells but one that may also impair groundwater quality (by increasing dissolved mineral concentrations when water is drawn deeper from the aquifer or by disrupting groundwater flow patterns and inducing saline or polluted surface water or brackish water

from another aquifer to flow into the freshwater aquifer). The overpumping of alluvial or surficial aquifers may also reduce their base flow discharges to surface water bodies, thereby reducing stream flows and also indirectly affecting stream quality (as ambient pollutant concentrations increase).

Both groundwater and surface water resources can be disrupted by contamination. Pathogens, minerals, and organic and inorganic chemicals polluting the groundwater can cause surface water to become polluted and vice versa due to the interconnections between the two. Significant contaminant sources include agricultural chemical use, wastewater discharges from public sewer and on-site wastewater disposal systems, solid and hazardous waste landfills, storage tanks, and industrial materials spills and waste impoundments. Impervious surfaces can not only reduce aquifer recharge, but can also increase water pollution and flood hazards by increasing the amount of runoff. Aquifer penetrations, such as injection wells, oil and gas wells, or improperly abandoned wells, may also introduce contaminants directly into an aquifer. Atmospheric deposition of contaminants can also impair water quality. The minimal attenuation and the impracticality of remediation of contaminants in groundwater, and the high cost of water treatment make prevention of contamination the only really effective means of protecting aquifers and the most efficient means of protecting surface water resources.

Jurisdictional complexity often makes it difficult to comprehensively manage and protect our water resources. For example, while state and federal environmental protection statutes set water-quality standards for surface water and drinking water, other state laws may govern groundwater and surface water ownership and use, and still other state and local laws might regulate land-use activities generating water demand or posing threats to water quality. The needs of nonconsumptive in-stream uses of water—such as the protection of fish and wildlife habitats, the enhancement of recreational activities, the maintenance of navigation, and the need to maintain ambient water quality standards—are more and more coming into direct conflict with the needs of consumptive off-stream uses for the same surface water. Large-scale diversions of surface water and excessive pumping of groundwater diminish stream flows, further aggravating intense surface-water-use conflicts. Greater coordination is clearly needed between the state agencies, between the state and local agencies, and between the local agencies responsible for different aspects of water resources use and management.

Water resource issues need to be integrated better into the comprehensive land-use planning process. Urbanization increases runoff from impervious surfaces, causing stormwater flooding and nonpoint source pollution problems. As cities grow larger and water demand starts surpassing the amount of water found locally, people and businesses begin to look further and further from the community to meet their projected water needs—to drill wells in other aquifers, pipe water from large rivers and lakes hundreds of miles to their town, and to augmenting rainfall. As water supplies become even more constrained, even more complicated and expensive schemes to obtain adequate amounts of fresh water may be considered, such as desalination of seawater or brackish aquifers, towing large bladders of fresh water through the ocean to dry port cities, or hauling icebergs to coastal areas. These escalating water supply schemes represent the direct costs to a region of "mining" its water resources at unsustainable rates. But there are also indirect costs, in lost potential for development and in the potential disruption of the existing economic and social order in the receiving areas if they don't have the additional water and in the donating areas from loss of their water resource. Futhermore, dependency upon water resources derived from nonsustainable sources can create long-term economic uncertainty and instability for the dependent communities.

Conservation, each user using less water, is one way to create "new" and perhaps more sustainable sources of water. Water reuse is important. Returning treated effluent to a river where the next town takes out water for its potable supply has been going on for years. Wastewater can be treated and reused for irrigating golf courses, agriculture, parks and gardens, treated and released to surface waters for recreational, navigational, and ecological purposes, or even cleaned to drinking water standards and reused for

aquifer recharge or water supply purposes. Similar strategies could also be used to manage stormwater.

Requiring water conservation, as the federal government did when it mandated water-conserving fixtures in the 1992 Energy Policy Act, is one approach to better managing our water resources. But, other strategies can also be employed—the conjunctive use of both groundwater and surface water resources, reducing water demand through Smart Growth initiatives and more sustainable land-use planning

GENERAL POLICY

Water should be treated as a collective public resource and managed in a sustainable manner.

1. Water should not be consumed to such an extent so as to:
   - interfere with its reasonable use by others;
   - impair the ability of a water resource to be naturally replenished; and
   - impair its ecological, recreational, or navigational functions.

2. Water should not be discharged in such a manner so as to:
   - interfere with its reasonable use by others;
   - create hazardous conditions (e.g., erosion, sedimentation, flooding and subsidence); and
   - impair its ecological, recreational, or navigational functions.

3. Pollution and other manmade threats to water resources should be minimized.

Commentary: *This general policy is intended to articulate a "Golden Rule" of water resources management. By considering water both a "collective" and " public" resource, APA recognizes that, despite differing state water laws, any private or individual "right" to use water remains only contingent and is therefore always subject to whatever governmental oversight as may be necessary to protect and further the greater general welfare. By requiring that water resources be used "sustainably," APA recognizes that there is a duty to manage water resources in such a way so as not to impair their present and future utility and value. Sound water policy must address the contemporary and long-term needs of humans as well as the ecological community. These management responsibilities, which become an ethical obligation because of the centrality of water to life itself, are expressed in greater detail in the specific policies listed below.*

SPECIFIC POLICIES FOR WATER USE

Policy 1. APA and its Chapters support legislation and funding to establish state comprehensive water resource and supply planning (conducted jointly by appropriate federal agencies, states, appropriate regional authorities, water utilities, and local governments), based upon watersheds and other natural hydrological boundaries (such as aquifer recharge and discharge areas) to the greatest extent possible. Ideally, such water resources planning should be undertaken within the context of comprehensive state planning.

The water resource and supply plans should include at least:

- a 20-year projection of water supply needs and service areas based on sound comprehensive planning principles;
- sources of surface and groundwater supply to meet needs;
- protection of watershed and evaluation of surface and groundwater resource impacts, and actions necessary to maintain or improve water quantity and quality to meet projected needs and to maintain the ecological, recreation, and navigational functions of the water resources;
- plan for water conservation and reuse, and, as appropriate, drought management and emergency contingency plans;
- a stormwater and floodplain management element addressing the on-site prevention, retention, and treatment of stormwater runoff;
- evaluation of alternatives to proposed plan including policies for resource and habitat restoration;

- environmental impacts and mitigating factors;
- analysis of existing and required legal and institutional arrangements, and roles and responsibilities of appropriate levels of government in carrying out the plan, including the use of intergovernmental or interstate agreements;
- a land-use framework for land located near sensitive water resources; and
- financing strategies for needed improvements, along with a system for monitoring or evaluating the attainment of plan objectives.

Commentary: *Responsible water resource use and management requires careful planning. The first policy establishes a planning process that integrates projected water demand and resource characteristics with an impact assessment process to ensure considerations of longer-term sustainability. This policy sets forth the specific elements of such a planning process that promote a more rigorous governmental consideration of water resource use and interaction.*

A minimum 20-year planning horizon is proposed to enable capital investments in water-related infrastructure to be recovered through financing mechanisms while ensuring a planning period that would allow for reasonably accurate demographic and other projections affecting water demand. The need for water users to repay bonds for water supply capital improvements or to repay state loans within a time period long enough to stabilize water utility rates suggests the need for longer-range rather than shorter-term water resource management planning. Although some states (e.g., Arizona, under its 1983 Water Use Act) may require that water for urban uses be secured for a century as a precondition of assessing water transfers, a 20-year planning horizon allows for more accurate longer-term need projections prior to making infrastructure investments.

Policy 2. APA and its Chapters support legislation to establish requirements for state comprehensive water-use permits issued pursuant to policies and criteria set forth in state comprehensive water resources and supply plans. State (and/or regional, in those states where multijurisdictional water districts exist) permit reviews should incorporate thorough environmental and socioeconomic review of applications for new or increased use of surface water and groundwater resources for consumptive and nonconsumptive uses prior to state approval or denial. State (and/or regional) requirements should be made pursuant to a public hearing process that involves all appropriate levels of government and allows public input to the decision-making process.

Commentary: *The withdrawal of waters for public, industrial, agricultural, and power generation uses should not be undertaken without a full understanding of the impacts of such withdrawals upon the quantity and quality of groundwater and surface waters, and without regard to the interests of competing users. This analysis should also address ecological and recreational values of the water resources. State and/or regional overview is essential to the full consideration of the hydrological, ecological, and growth impacts of interbasin transfers, downstream quality and quantity impacts of upstream users, and the groundwater/surface water interrelationships of withdrawals and diversions. States need to consider comprehensively managing the consumptive use of all of their water resources—groundwater as well as surface water withdrawals — through a comprehensive permit system administered at the state or the regional level. The permit process should be designed to maximize public participation to ensure that all interests are represented in water-use permit decisions.*

Policy 3. APA and Chapters support legislation requiring land-use and health regulations for source water protection in order to protect the existing water quality and capacity of aquifers and surface water resources.

Commentary: *Because of the high costs of water treatment and aquifer remediation, source water protection for drinking water supplies remains a policy priority.*

Policy 4. Water conservation must remain an important water resource and supply plan objective. APA and its Chapters support state legislation requiring the metering and leak detection of all significant private or public community drinking water system

service connections as well as all major industrial, commercial, or agricultural users to promote and monitor water conservation.

Commentary: *Water conservation remains an important component of any water supply plan. Metering provides an incentive for users to conserve water and the evaluation of leakage and other unaccounted for flow is essential in promoting and monitoring the success of water conservation efforts. Other measures, such as using reclaimed water or higher-efficiency systems for irrigation or employing drought-resistent or natural landscaping, can also be effective in reducing water use.*

Policy 5. APA and its Chapters support appropriate state legislation establishing standards and permits for construction, operation, and abandonment of all wells. These standards should be based on the long-term sustainable yield of the water resources.

Commentary: *Improperly constructed or abandoned wells can provide opportunities for water supply contamination and aquifer interconnection, especially for larger wells (10,000 gpd and larger) used for public water supply, industrial, and irrigation purposes. The impacts of all new major wells and existing wells that are abandoned should be assessed through a permit system requiring preconstruction and postclosure review. Operation guidelines for major wells, including controls on pumping rates, can also help manage well interference problems and stream baseflow reductions, while backflow valve requirements can protect against groundwater contamination by agricultural chemicals. Well permits issued by local permitting officers, boards of health or State environmental agencies should also be required for smaller noncommunity onsite domestic water supply wells.*

Policy 6. APA and its Chapters should support legislative action and policy to manage stormwater runoff and its attendant water pollution risks. These policies include recognizing EPA-approved Nonpoint Source Management Plans (as established by Section 319 of the Clean Water Act) as an appropriate vehicle for allocating coastal, agricultural, urban, and other nonpoint source management program efforts and funds, and implementing plans and programs promoting best management practices to better control municipal and industrial stormwater runoff and discharges. APA and its Chapters emphasize the value of encouraging appropriate land uses in areas of sensitive water resources, and also support the establishment of local development standards that incorporate best management practices for managing postconstruction impacts on surface and groundwater resources. APA National and its Chapters continue to emphasize the importance of local comprehensive planning in legislation that is proposed for the management of stormwater runoff and nonpoint sources.

Commentary: *Approved Nonpoint Source Management Plans establish uniform, state-specific blueprints for the nationwide effort to remediate all nonpoint sources of groundwater and surface water pollution through state land-use-related water quality management programs. Stormwater management remains a priority issue in many urban areas, where runoff and discharges from construction activity, small municipal separate stormwater systems, industrial stormwater systems, and combined sewer overflows threaten surface water and groundwater quality. Best management practices, many employing land-use controls, offer an important strategy for controlling these risks. Stormwater should be considered a water resource instead of a waste product, with natural attenuation, infiltration, and recharge promoted over collection, transport, storage, treatment, and discharge. This policy also encourages Smart Growth by promoting land-use patterns that minimize the generation of nonpoint source pollution and site planning that uses established best management practices to control pollution, especially with respect to stormwater runoff that can be treated onsite.*

POLICY 7. APA and its Chapters should encourage legislation, with adequate federal funding, to require periodic comprehensive updating of Wastewater Facility Plans, consistent with local comprehensive plans, as a condition for receipt of state revolving loans or grants. The process for updating facility plans should be coordinated with revisions to community comprehensive plans and the integration of Smart Growth policies to focus new development in those areas served by existing wastewater infrastructure.

Commentary: *The facility plans in the 1970s are approaching their design years. The current federal rules do not encourage comprehensive updating of these plans, but rather spot changes, often in conjunction with individual development proposals. Local plan consistency should be addressed as a requirement for the receipt of federal funds. Although this policy was initially adopted in APA's earlier Surface Water PIP, this is still an important policy to promote, especially since some states using revolving loan funds may propose phasing out facility plan requirements in order to reduce their administrative burdens.*

Policy 8. APA and its Chapters promote aquatic biodiversity and habitat recovery by supporting programs that reduce hydrological alterations, the deterioration of habitat quality, and the deterioration of water quality. APA and its Chapters should promote regulatory development that emulates the natural hydrologic and ecologic regimes in an increasingly robust fashion, including the restoration of degraded stream reaches and their riparian areas, including associated wetlands.

Commentary: *Waterways and their riparian areas are critical habitats for a variety of wildlife. Straightening, cementing over, and otherwise altering stream channels and wetlands remove the opportunities for biodiversity and also impact important ecological processes that remove pollutants and improve water quality. Health of riparian areas is an important indicator of ecosystem health and consequently of the sustainability of human activities within a watershed.*

Policy 9. APA and its Chapters should support federal and state environmental protection agencies in implementing the Total Maximum Daily Load (TMDL) program of the Clean Water Act and the development of baseline, reference TMDLs associated with specific land uses.

Commentary: *The Total Maximum Daily Load (TMDL) program of the Clean Water Act requires a comprehensive inventory and assessment of impaired waters in order to determine the amounts of pollutants being discharged into a waterway from all potential sources. Without this information, it is impossible to take the next step, which is to devise a plan to allocate the amount of pollutants each source may discharge (through regulations or by market-based mechanisms) and thereby clean up the waterway to the point it meets the fishable and swimmable standard. Watershed plans that support agreements between local entities will be needed in order to achieve regional strategies that truly move towards meeting TMDL compliance.*

Policy 10. APA and its Chapters should support legislation to reauthorize and expand federal funding under the Clean Water and Safe Drinking Water Acts for water infrastructure (including funding authorized to support State Revolving Loan Funds) and to reauthorize the Coastal Zone Management Act. These legislative initiatives would provide continuing funding for nationally important water quality, infrastructure, and resource protection programs, while addressing the critical issues of controlling nonpoint sources, enhancing coastal resources, and protecting national estuaries and outstanding waters.

Commentary: *EPA and the federal government need to maintain and strengthen their partnership with state and local governments in funding water quality improvement and infrastructure programs. State revolving loan funds offer new opportunities to consider state land-use and "smart growth" objectives within integrated priority ranking systems by incorporating such considerations into the ranking system in addition to the more traditional public health and environmental criteria. Infrastructure investments can also be tied better to land use by the use of various economic incentives (e.g., lower interest rates or alternative repayment structures) for projects supporting state and regional land-use policies. Given the large population growth projected within our coastal areas, supporting the reauthorization of and expanded funding for the Coastal Zone Management Act remains a critical legislative priority for APA and its Chapters.*

Policy 11. APA and its Chapters should support legislation establishing interstate or regional compacts to limit drawdowns of shared aquifers and the use of common surface waters. APA and its Chapters and key water policy decision makers should actively encourage states, tribes, and interstate and basin authorities to seek negotiated agree-

ments, ratified by appropriate legislation, to resolve issues regarding water allocations and to develop water resource management systems on an aquifer or watershed basis, to the greatest extent possible.

Commentary: *Adjudication can be an effective, but complex, lengthy and expensive means of resolving water rights. Adjudications can act to bring parties to the negotiating table, but negotiated settlements are far more likely to result in long-term, constructive relationships — especially since the U.S. Supreme Court's ruling in* Kansas v. Colorado*, handed down in June 2001, allowed damages to be imposed on a state for violating the Arkansas River compact. In the wake of this decision, federal courts may be more willing to enforce interstate (and, by implication, state/tribal) water agreements and compacts and to both impose and uphold sanctions against entities violating these agreements.*

Policy 12. APA and its Chapters support legislation providing opportunities for the integrated management of groundwater and surface water supplies, and funding for research on strategies for the integrated management, monitoring**,** and use of surface and groundwater. Whenever possible and appropriate, the planning area of such management programs should be based on natural hydrologic features, such as watersheds and aquifers. APA and its Chapters also support and encourage the development of land-use variables within water resource models.

Commentary: *There is much we still need to learn about the interrelationships of surface and ground water. Monitoring of these resources is a complex and costly venture, but necessary if we are to assess their status and be alerted to new sources and instances of contamination. APA and its Chapters should support increased funding of federal and state programs that monitor, model, assess, and map our nation's groundwater and surface water resources.*