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SMALL HYDROELECTRIC PROJECTS

Title IV - Small Hydroelectric Power Projects of the Public Utilities Regulatory Policies Act, enacted as part of the President's National Energy Plan, directs the Secretary of Energy to establish a loan program to encourage the development of small hydroelectric power projects in connection with existing dams which are not being used to generate electric power. Title IV defines "small hydroelectric power project" as any hydroelectric power project which is located at the site of any existing dam, which uses the water power potential of such dam, and which has not more than 15,000 kilowatts of installed capacity.

Section 402 of Title IV authorizes the Secretary to make loans to any municipality, electric cooperative, industrial development agency, non-profit organization, or other person to assist such person in defraying up to 90 percent of the costs of 1) studies to determine the feasibility of undertaking a small hydroelectric power project at an existing dam or dams and 2) preparing any application for a necessary license or other Federal, State and local approval respecting such a

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project at an existing dam or dams and in participation in any administrative proceeding regarding any such application.

The interest rate of loans will be the discount or interest rate used at the time the loan is made for water resources planning projects under Section 80 of the Water Resources Development Act of 1974. This rate has been established at 6 7/8 percent for the Federal Government's 1979 Fiscal year, ending September 30. The discount rate is presently permitted to change no more than 1/4 percent, from one year to next. It is anticipated that the rate will increase by 1/4 percent in FY 1980, and will probably increase in future years. The term of these loans may not exceed 10 years. The Secretary may cancel the unpaid balance and any accrued interest on any of the above loans if he determines on the basis of the study that the small hydroelectric power project would not be technically or economically feasible. Title IV authorizes for each of Fiscal years 1978, 1979 and 1980 \$10,000,000 in loans for feasibility studies, such funds to remain available until expended. As of this date Congress has appropriated \$10,000,000 for feasibility loans.

With the National Energy Act passed by Congress on October 15, 1978 and signed into law by the President of the United States in November of 1978, the Department of Energy is busy formulating the details and regulations needed to implement this legislation. Present projections indicate that a draft of the feasibility loan regulations will be completed during the Spring of 1979, and distributed for public comment.

Title IV also authorizes loans for project costs of small hydroelectric power construction projects. As of this date Congress has not appropriated funds for construction project loans. Separate regulations will be developed to establish this program when appropriate. (From a DOE letter dated December 22, 1978.)

STATE WATER RIGHTS

The right of California state officials to impose conditions on the use of water in the federal government's New Melones Dam in the San Joaquin Valley was upheld by a ruling by the United States Supreme Court on July 3, 1978. Similarly, the High Court ruled in favor of New Mexico in a decision giving the state primary control over water from the Rio Mimbres River which flows through the federal government's Gila National Forest.

Justice William Rehnquist, who wrote the majority opinion, stated that "the Reclamation Act of 1902 clearly provided that state water law would control

in the appropriation and later distribution of the water" for federal projects.

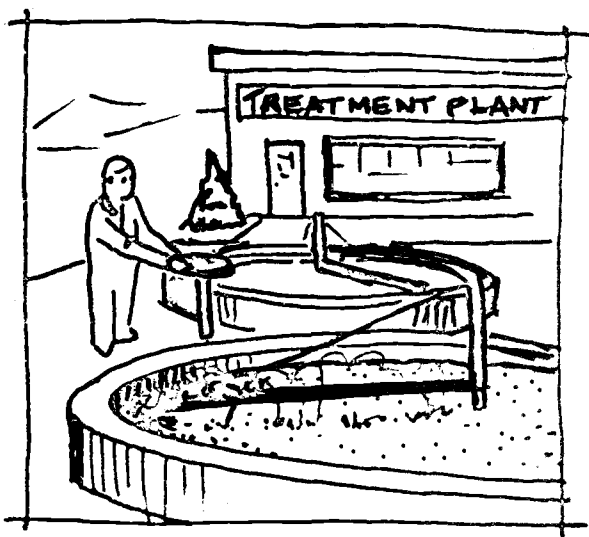
In addition to California and New Mexico, the ruling affects Arizona, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, North Dakota, Oregon, Oklahoma, South Dakota, Texas, Utah, Washington and Wyoming.

The Supreme Court's ruling does not cover a federal practice that is controversial in nature: limiting the sale of water to holders of land tracts of fewer than 160 acres.

WATER AND ENERGY

Energy and water are linked resources. A pilot study in Illinois examined the relationship between energy and water from a direction opposite to that of most studies. It concerned itself with evaluating the energy required to supply and treat water, rather than with the water requirements of energy production. The primary energy requirements for three sectors of water management -- municipal water supply, municipal sewage treatment, and water for irrigation -- were evaluated. Six major cities, Chicago, Denver, Los Angeles, New Orleans, San Antonio, and St. Louis, were used as indicators of the national trend in energy requirements to supply water to municipalities. Nationwide data provided by the federal Environmental Protection Agency for 1977 and 1990 were used to determine the rate of change of energy required to treat municipal sewage over the period. The energy required to supply water for irrigation was estimated for three regions in the Southwest: Kern County, California; the Texas high plains; and San Carlos, Arizona.

Historic trends and prospects for future development were used to estimate future energy requirements for each of these water sectors. The projections were compared to expected increases in national energy consumption. The results indicated that:



1. Regional differences in the amount of energy needed to supply water are very large, increasing in some places and decreasing in other.
2. Significant nationwide increases are likely for the energy required to treat sewage.
3. Before the year 2000, in the absence of severe drought, energy requirements for water supply and water treatment will most likely be met without major problems. Additional analysis of the long-term options for water supply in the arid Southwest and for sewage treatment throughout the United States should be undertaken, however, if the

nation is to successfully meet both the demand for energy and the demand for water after the year 2000. Regional planning and multipurpose construction of water systems should be emphasized in these studies. In addition, alternatives should be compared on the basis of comprehensive cost-benefit analysis in which the political, economic, geographic, environmental, and social variables that influence water consumption and its associated energy requirements are simultaneously considered. The energy requirement for water supply and water treatment is exceedingly important because it reflects ways in which our physical environment is affected in maintenance of water systems, but it is only one of many important factors that must be considered in the attempt to ensure efficient allocation of resources.

(From "Resource Analysis: Water and Energy as Linked Resources." UILU-WRC-78-0134, Research Report #134, August 1978. Water Resources Center, University of Illinois at Urbana-Champaign.)

LAND USE PLANNING EVALUATED

(Extracted from an article by Edward J. Sullivan in the September 1978 issue of the Department of Land Conservation and Development newsletter entitled "Oregon Lands". Mr. Sullivan is a Portland attorney.)

The constant attention the Oregon Land Use Program has received since its inception in 1973 invites a comparison with programs of other jurisdictions. It is the purpose of this article to sketch alternatives to the Oregon program taken by other states, as well as that of England and Wales.

In undertaking this review, five criteria will be used:

- 1) local planning and development control,
- 2) citizen participation in local planning,
- 3) protection of the state and national interest,
- 4) a minimum of state interference, and
- 5) some certainty for citizens and land owners.

All the jurisdictions covered in our survey have some form of authorization for planning and development control. In the United States, this has been accomplished by the Standard Zoning Enabling Act, prepared by the U.S. Department of Commerce under Secretary Herbert Hoover in the early 1920's. Basically, this document allows local governments to zone; however, it is not clear whether any plan must be prepared and, if so, whether it must be followed. For most jurisdictions, the answer to the question is no.

Planning and development controls are sometimes supplemented by a permissive planning system. Such a system fails the second (citizen participation), third (protection of state and national interest) and fifth (certainty for citizens and landowners) criteria due to the absence of any requirement to make or follow a plan, and complete delegation of planning and development control to local government. It might be added that litigation in these jurisdictions is most frequent since "making back room deals," saving the best evidence for the courts, and all sorts of questionable practices are associated with the lack of criteria for development.

Another variation is the system used by Hawaii, Maine and Vermont. Hawaii has a state plan, but local governments there have powers to control development in urban and semi-urban areas. It thus fails the first (local planning and development control) and fourth (minimum state interference) criteria. Maine and Vermont seem less concerned with plans, than with a state veto power over certain developments, adding on state approval to any local regulations. Again these approaches fail the first and fourth criteria.

The English approach has some similarities to that of Oregon. Planning is done by county councils which must submit "structure" (i.e. policy) plans for central government approval; local participation in plan formulation is guaranteed, as

(LAND USE cont'd)

well as in hearings held in behalf of the Secretary of State for the Environment on plan approvals. Upon approval, further planning is left to sub-counties (or districts).

There are three major defects, from an American standpoint, to the British system. First, plans are only advisory and local governments have power to override them. Second, grants of "planning permission" which is required for nay "development" (defined all inclusively) is entirely discretionary at the local level and doesn't require a hearing. Third, denials (or approvals with conditions disliked by the applicant) cannot be appealed to the courts, but only to the Secretary of State, and then only by the applicant. The Secretary can grant permission after hearing the case all over again. This approach probably fails the first (local planning and development control) and certainly fails the fourth (minimum state interference) and fifth (certainty for citizens and landowners) criteria.

Less ambitious approaches seek to require planning or development control (or both) for only certain specified areas. The New York Legislature has required a regional agency to promulgate, after public hearings, a plan for the Adirondack area and followed it with state and local development control for different classes of land uses. This approach fails the first (local planning and development control) and fourth (minimum state interference) test.

A final alternative is the California approach which sets out statutory standards for local plans, which must be adopted, but provides no expert, quick, and procedurally easy method to resolve conflicts, relying instead on the cumbersome machinery of the courts. It thus fails the fifth test (certainty for citizens and landowners).

In this brief survey, one can see the merits of the Oregon system. It is more balanced than any other, providing for the protection of the state's interests (as in agriculture, industry, housing, and natural resources, all of which affect the state as a whole) while requiring planning and development control to meet certain standards of citizen participation and yet remaining primarily a local matter. It therefore minimizes state interference and aims at as much certainty as is possible in a dynamically changing circumstance.

Indeed, the Oregon system approaches the genius of the U.S. Constitution in its balance of the various interests involved. Oregonians have a system that is renowned both nationally and internationally, but it is up to us to see that this system, so well conceived, retains its balance in operations.

FARMERS PLOT

FARMERS PLOT TO PARALYZE PURCHASERS Farmers in Minot, ND are trying to beat the federal dam builders at their own game. Construction of a \$100 million dam is being considered to protect farmers and the town of Minot from frequent flooding by the nearby Souris River. Some 50 farmers, unhappy about the plan that would flood their land permanently, are going to make it difficult for the government to buy the land needed for the dam. According to Rural American News Service, the farmers have subdivided one acre of the land into 4,840 parcels, one square yard each. The postage-stamp plots sell for \$20. At least a thousand plots have been sold, and the farmers hope the government will hog-tie itself in its own red tape trying to buy up each parcel.

DRINKING WATER SYSTEMS

Nearly 300 drinking water systems in Oregon scattered throughout 33 of the State's counties have failed to provide EPA with reports about bacteria, turbidity and inorganic chemicals contained in the drinking water they serve to their customers. Failure to submit the periodic monitoring reports is a violation of the Federal Safe Drinking Water Act of 1974, the statute that set national drinking water standards. Since those standards went into effect in June 1977, a total of 92 Oregon systems have never submitted any report at all, and another 203 have filed reports on a hit-and-miss basis. Taken together, those 295 systems provide drinking water to 143,000 customers, and represent almost one-third of all 914 community drinking water systems in Oregon.

Noncompliance with the reporting requirements is troubling Donald Dubois, EPA's northwest regional administrator. Says Dubois: "What it comes down to is 'what you don't know can hurt you.' If you don't know there are impurities in the water, or that there's so much turbidity as to interfere with disinfection, you'll never be able to take corrective action, with the results that people face an increased risk of getting sick."

According to the State's own calculations says Dubois, Oregon has four times as many waterborne disease outbreaks as the national average. (From "Northwest Environment", October 1978, EPA, 1200 Sixth Ave., Seattle, WA 98101.)

MODELING AS A TOOL

The past decade has witnessed the growth of mathematical modeling as a valid method of analysis of water resource problems. A recent report describes the results of a survey of 349 planning and public works agencies to evaluate and analyze the use of modeling for the planning and management of urban water problems. The goal was to determine the extent of model usage and the impact of modeling on policy and decision making.

Forty-three (43) percent of the agencies indicated involvement in the use of urban water modeling, either directly or through consultants, and 31 percent never considered the use of a water model. Federal or state agencies and consultants were the major sources of urban water models. In 52 percent of 220 model applications described by the agencies, the modeling was considered to have had an

impact on the plan or policy ultimately adopted. In essentially all the model applications, the modeling was evaluated as very useful or moderately useful and at least as useful as alternative techniques.

The report also documents and examines in detail eight case studies of modeling applications by cities, counties, and regional agencies. The case studies include a variety of model types and water problems to demonstrate the utility of modeling for urban water planning and management.

It is not the intent of the report to advocate the use of water models for all urban water planning problems. The relevancy of modeling or a specific model to a specific water problem must be determined on a case-by-case basis. The work has shown that modeling is being used in many areas for analysis of flood control, storm drainage, water supply, water quality, and recreation/environment problems. When applied in a

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MODELING TOOL (cont'd)

rational manner with recognition of its strengths and limitations, modeling can be an effective method of analysis, the report concludes.



(From "Planning and Modeling in Urban Water Management." Report prepared for USDI by Hydrocomp Inc., 1502 Page Mill Road, Palo Alto, CA 94306. Dated October 1978)

WATER POLICY MEETINGS

Federal agencies and departments have established 19 task forces to implement the President's water policy reforms announced to the U.S. Congress on June 6. Creation of the task forces was in direct response to Presidential directives issued July 12 to the heads of several agencies and departments. In general, task force responsibilities fall into four areas -- planning reform, environmental quality and water resources management, water conservation and federal/state cooperation in water management.

To comply with deadlines set by the directives, the task force submitted draft work plans in October to Guy Martin, Assistant Secretary of Land and Water Resources in the U.S. Interior Department, outlining the goals of the task forces and the steps that would be taken to meet these goals.

The President has made public participation a key element in implementation of his water initiatives, and Assistant Secretary Martin has told the task forces to involve and solicit public

comment in their efforts. All task force meetings are open to the public. Information about times and places can be obtained from John Cunningham, task force coordinator, Department of Interior, Office of Assistant Secretary, Land and Water Resources, Room 6541, Washington, D.C. 20240, (202) 343-8059. (From "Conservation News", Vol. 43, No. 23, December 1, 1978.)

CONTROL OF SEDIMENTATION

A different method for controlling erosion and sediment transport during highway construction was used in each of four adjacent drainage basins in central Pennsylvania. The basins ranged in size from 240 to 490 acres (97 to 198 hectares), and the area disturbed by highway construction in each basin ranged from 20 to 48 acres (8 to 19 hectares). Sediment discharge was measured from each basin for 3 years before construction began and for 2 years during construction. In one of the basins affected by the construction, three offstream ponds were constructed to intercept runoff from the construction area before it reached the stream. In another basin, a large onstream pond was constructed to trap runoff from the construction area after it reached the stream. In a third area, seeding, mulching, and rock dams were used to limit erosion. In the fourth area, no sediment controls were used.

The effectiveness of the various sediment-control measures were determined by comparing the sediment loads transported from the basins with sediment controls to those without controls. (From "Effectiveness of Sediment-Control Techniques Used During Highway Construction in Central Pennsylvania". U.S.G.S. Water Supply Paper 2054, 1978.)

RESEARCH ON DRAINAGE

As land use changes from rural to urban, the cost of providing adequate drainage systems and reasonable levels of water quality rises. The greater proportion of the land with high permeability in the rural setting results in lower runoff and higher water quality because the soil acts as a living filter improving water quality before it reaches the underground tile drains. In the rural areas, most tile drains flow into open drainage ditches that are very inexpensive to build because they have no concrete lining.

When urban development occurs, the least costly drainage system involves combining some of the open channel drainage systems with enclosed storm water pipes from the new subdivisions. This is still the least expensive system even when the open channels must be lined with concrete to maintain bank stability and to increase the increasing rate of flow in the channel due to the development of an urban rather than rural hydrograph. The water quality changes as urban development occurs because different types and concentrations of pollutants occur in the runoff from watersheds with large areas of low or zero permeability land surface. With the loss of soil as a living filter, further deterioration of water quality may occur.

The urban drainage system can be developed with or without detention storage capacity in the system. Complete pipeline systems with no open channels that have detention storage are more costly than pipeline systems without detention storage. The reduced cost of pipe because lower sizes are possible is exceeded by the additional cost of detention storage. This relationship holds whether the detention storage is one large facility or several smaller facilities distributed throughout the watershed. Detention storage is still more costly than pipelines alone even when the storage is a low grass area in a recreational park rather than a concrete lined facility.

Research indicates that the number of detention storage facilities is a positive function of cost in most cases. Therefore, a single facility is generally less costly than multiple detention facilities in the watershed. With very large volumes of detention storage, the number of facilities has strong interaction with the location of the facility so the economically least expensive system is a joint function of size, number, and location. (From "Systematic Development of Methodologies in Planning Urban Water Resources for Medium Size Communities", by W. L. Miller. Technical Report #111, November 1978, Water Resources Research Center, Purdue University.)

Drainage

