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Digest of a Performance Audit of Utah Water Loan Program

This study focuses on issues surrounding the state's water loan program. In general, our study found that many of the issues pertaining to the water loan program are contingent upon the Legislature's intended objective for the program. Policy decisions regarding the level of assistance the state should provide for water development, the size of the state's water loan program, and how the program is funded will all impact the direction of the program. Specifically, our review of financing approaches available for use in the water loan program concluded that given the same amount of state funding, more water projects can be financed with interest rate buy-downs than revolving-loans; buy-downs require fewer state dollars to finance the same number of projects as revolving-loans; and if funded at the same level as the revolving-loan program, buy-downs can be used to maintain a balance of funds in the program. Revolving-loans maintain a balance of funds in the program; provide convenient financing to communities unable to access the market; and allow state agencies flexibility in extending and restructuring loan terms. Our review of funding methods concluded that the Legislature should consider alternative funding methods that have been proposed to supply capital to the water loan program. And our review of consolidation of the four water boards concluded that consolidation would probably not result in significantly greater efficiency.

Under the current program, the state assists local governments with water development projects by providing low interest rate loans. These loans are typically 2 to 5 percent below the prevailing market interest rate. In order to secure a loan from the state, local governments sell bonds to the state which bear the same interest rate as the interest rate on the loan they receive. The state currently holds approximately $324 million in outstanding bonds in its water loan portfolio. The state's water loan program is administered by four water boards: the Water Resources Board, the Drinking Water Board, the Water Quality Board, and the Community Impact Board (CIB). The water loan program is currently funded through state appropriations, federal appropriations, interest earned on revolving-loans, and mineral lease revenue.

Recently, political leaders and finance professionals have raised questions about the way the water loan program is administered. Their concern has centered on: a) whether more projects could be financed by using state dollars for interest rate buy-downs instead of revolving-loans; b) whether there are better ways to fund the program; and c) whether consolidation of the four water boards under a single board would result in greater efficiency. Critics of the current program argue that the state should not be so heavily involved in the banking business. The state's water loan portfolio is larger than the municipal bond portfolio of some of the state's largest banks. The critics wonder how large the program will eventually become and what level of funding it will take to maintain the program. Our office was asked to study the above issues and provide

information back to the Legislature. A summary of our findings is outlined below:

Choice of Financing Approach is a Policy Issue: The decision of whether to emphasize the use of interest rate buy-downs or revolving-loans in the state's water loan program is a policy issue dependent on the Legislature's objective for the program. Is the objective of the program to finance as many projects as possible? Should more projects be financed now or in the future? How much money should the state appropriate to the water loan program? Is the program currently large enough, too large, or not large enough? As the state continues to grow and the demand for water development projects increases, the objective of the program should be made clear and set forth in policy by the Legislature. The answer to these policy questions will determine whether the interest rate buy-down approach or the revolving-loan approach should be emphasized in the water loan program.

Our comparison of interest rate buy-downs versus revolving-loans determined that the use of in the water loan program will allow the state to finance more water projects with the available state funds. Buy-downs can also be used to finance the same number of projects as revolving-loans but with fewer state dollars. If funded at the same level, the buy-down approach can match the projects financed under the revolving-loan approach and still maintain a balance of funds in the program similar to the revolving-loan approach. On the other hand, revolving-loans finance fewer projects with available state funds but maintain a balance of funds in the program. The revolving-loan approach also offers easy and convenient access to financing for local governments that are unable to access the market. State officials also report that the flexibility of revolving-loans allows them to make special financing arrangement and restructure loan terms when necessary. Some costs of accessing the market are also eliminated under the revolving-loan approach.

Under the buy-down proposal, water projects would be financed through a combination of loans from the private sector and financial grants from the state. Grants from the state would be used to reduce the commercial rate on the private sector loans to a more affordable level (i.e., interest rate buy-down). The size of the grant would be negotiated between the community and the water board just as interest rates are determined under the current revolving-loan approach. Under this approach, the state would no longer be the primary lender on water projects. Instead, the state would be the lender of last resort, only making loans to communities unable to access the market. The private sector would become the primary lender on water projects in the state.

Agency officials are hesitant to use the buy-down approach as the primary method of financing water projects. They are hesitant because financial grants used to reduce interest rate expense under the buy-down approach may eventually deplete the program if additional appropriations or alternative funding methods are not authorized. Our analysis confirmed that the buy down approach depletes the program. However, we also found that low interest rate revolving-loans also deplete the program. Every time

the state makes a loan at an interest rate below the prevailing market rate, the program is eroded. The program is eroded because the bonds issued by local governments as security on the loans from the state are discounted in value because they are issued at the same, below the market interest rate, as the loans. The discount occurs because investors are unwilling to pay the full amount for bonds yielding less than the market rate of interest. Essentially, the discount the state incurs on the bonds equates to a financial subsidy from the state to the local government issuing the bond. This is why financial professionals refer to the state's revolving-loan program as a "disguised grant" program. It is also one of the reasons why the Legislature is asked for additional appropriations to fund the program on a regular basis.

If the Legislature elects to emphasize the use of interest rate buy-downs as the primary mechanism for assisting local governments with water projects, there will still be a need to maintain a modest revolving-loan program to assist communities that are unable to access the market. We found that some communities are unable to meet the credit and financial standards required by the market. For these communities, the state may be the only source of financing. Ultimately, the Legislature must determine whether the objective of the program would best be met by the interest rate buy-down approach or the revolving-loan approach.

Alternative Funding Approaches Should be Considered: Our analysis found that the Legislature should consider alternative methods for funding the water loan program. Currently, funding for the program comes from direct appropriations. However, state officials and financial professionals suggest there are other methods of funding that could be used. Three of the alternative funding methods proposed include: (a) establishing a trust fund; (b) using a recapitalization approach; and (c) adopting the bond banking method.

Proponents of these proposals suggest that they could be used individually or in combination with one another to reduce the demand for Legislative appropriations to fund the program. Under the trust fund proposal, the state would liquidate its bond portfolio. Proceeds from the liquidation would be placed in a dedicated trust where the principal would remain untouched. Interest earned on the trust would be used to finance interest rate buy-downs year after year in perpetuity. Under the recapitalization proposal, the state would pledge the repayment stream from the water loan portfolio as security for issuing new state water revenue bonds. Proceeds from the state water revenue bond would be used to recapitalize the program. This approach immediately recirculates the loans instead of waiting for the loans to mature. Under the bond bank proposal, the state would survey the needs of local governments for water projects each year. After determining the combined need, the state would then issue revenue or general obligation bonds on behalf of the local governments to finance the projects. This approach lowers the overall cost of the projects because the state is able to obtain a lower interest rate on bond issues based on its excellent credit rating. Experts estimate

an interest rate savings of about 0.25 to 0.75 percent could be achieved on each project.

The Legislature may want to consider testing the proposed funding alternatives on a limited basis to determine how well they perform under real circumstances. Estimates show the demand for water projects will continue to increase as the state continues to grow and prosper. The Legislature will be faced with increasing pressure to fund additional water project development. The alternative funding methods discussed in this report may help the Legislature meet some of the future funding needs.

Consolidation of Water Boards Would Probably not Result in Greater Efficiency: Our analysis concluded that greater efficiency would probably not result from consolidating the four water boards. We found that each of the boards administers uniquely different regulatory programs---programs that probably could not be efficiently combined. In addition, we found relatively few jointly funded projects. On the jointly funded projects we tested, we found no significant overlap or duplication of services. However, we did find that the boards have not fully utilized a coordinating council authorized by the Legislature or filled an investment banking officer position authorized by the Legislature. In our opinion greater efficiency could possibly result, particularly in the finance/loan function administered by the boards, if the coordinating council was fully utilized and the investment banking officer position filled. The coordinating council is discussed in Chapter 4 and the investment banking officer position is discussed in Chapter 2.

Chapter I
Introduction

Recent debate between state officials and financial experts has raised questions concerning the state's water loan program. The focus of discussion has centered on three main topics: a) whether the state should provide assistance to local government water projects through the use of interest rate buy-downs or revolving-loans; b) whether other funding methods should be considered instead of direct appropriations; and c) whether the four water boards that currently administer the program should be consolidated under a single water board. Finance professionals argue that more projects could be financed with the state's limited dollars through a combination of private sector loans coupled with state grants to buy the municipal interest rate down on private sector loans. They also suggest funding mechanisms, other than direct appropriations, are available to supply capital to the program. Others have suggested that administrative overlap and duplication of effort result from having four separate boards administer the state's water loan program.

The state of Utah is one of the most arid states in the nation. The need for water development is necessary for the continued growth and prosperity of the state. In 1947, the Legislature appropriated $1 million to establish a program to assist irrigation companies and unincorporated communities with water projects. The program was intended to provide low interest rate loans to for water development projects too small to receive federal funding. The funds were intended to be lent out, repaid, then lent out again, which is how the name "revolving-loan program" was derived. The program has grown significantly over the years. To date, there are in excess of 824 outstanding water loans with an outstanding balance of approximately $324 million. The water loan program is administered by four water boards: the Drinking Water Board, the Water Quality Board, the Water Resources Board, and the Community Impact Board.

Debate over the water loan program has centered on the role of state government in this area of public finance and whether a more efficient way of administering the program exists. Finance professionals argue that the state should not be so heavily involved in the banking business; that instead of being the primary lender on water projects, the state should be the "lender of last resort," only making loans to communities incapable of obtaining private sector financing. They recommend financing water projects through a combination of private sector loans coupled with financial grants from the state. Under this approach, local governments would issue bonds on the open market and apply to the state for a grant. The grant would be used to reduce the interest rate on bonds issued by the local governments to a more affordable level (here after referred to as an "interest rate buy-down"). Proponents of this approach indicate that more projects could be financed using interest rate buy downs than revolving-loans. Conversely, however, supporters of the revolving-loan approach argue that interest rate buy-downs are appropriate only in limited circumstances, arguing that if state funds are given out in the form of grants, the program will eventually be depleted. They fear additional funds will not be available to sustain the program. These officials favor the revolving-loan approach

because, although it finances fewer projects, it returns principal plus interest on each loan. In addition, they indicate that revolving loans provide greater financing flexibility at a reduced cost to borrowers. Chapter II of this report explores the advantages and disadvantages of interest rate buy-downs versus revolving-loans.

Another issue being debated focuses on how the water loan program is funded (i.e., how it receives money to finance interest rate buy-downs or revolving-loans). Currently, the program is funded through Legislative appropriations. Since 1947, the Legislature has appropriated approximately $196 million to fund the water loan program. However, some state officials question whether direct appropriations are the best way to fund the program. They contend the program would operate more efficiently if a permanent source of funding was established. Finance professionals suggest that the loan portfolio should be sold or refinanced in order to recirculate the funds. Three alternative methods for funding the program have recently been proposed. The alternatives are referred to as the trust account program, the recapitalization program, and bond banking. These alternatives are discussed in Chapter III of this report.

There are approximately $324 million in outstanding loans on the books of the water loan program. Over the years, funding for the program has come from state appropriations, federal appropriations, and interest earned on revolving-loans. In addition, the Community Impact Board has its own source of annual funding from mineral lease programs. Figure I shows the outstanding loans from each of the four water boards.

Figure I
Water Loan Portfolio
April 1995

Water Board	Number of Loans	Amount of Loans	Outstanding Balance
Drinking Water Board	88	$ 40,601,016	$ 30,471,616
Water Quality Board*	62	87,191,899	76,692,265
Water Resources Board	562	230,401,577	173,016,573
Community Impact Board**	112	55,065,191	44,268,122
Total	**824**	**$413,259,683**	**$324,448,576**

** According to agency officials, approximately $56 million of the funds in Water Quality are tied to the federal program, meaning funding has come directly from the EPA or that state matching funds were used to qualify for the federal funding.*

*** Estimates for CIB are for water related projects only and do not include other projects financed through the CIB.*

The last issue being debated deals with the administration of the water loan program. It

has been argued that greater efficiency could be obtained by consolidating the four water boards into a single board to oversee and administer the program. Critics charge that having four separate boards results in overlap and duplication of administrative effort. Agency officials disagree with this view, claiming little administrative overlap exists and that excellent communication exists between the boards. Chapter IV of this report will discuss the issues surrounding consolidation of the four water boards.

Understanding the State's Water Loan Program

Under the current revolving-loan approach, two things occur when the state makes a loan to finance a local government water project: first, the state finances the project by purchasing a bond from the local government and second, the state subsidizes the project by purchasing the bond at an interest rate that is lower than the market rate. Purchasing the bond below the market rate represents a financial subsidy from the state to the community. The state's water loan program has assisted local governments to build hundreds of projects at lower rates of interest. However, when the state purchases local government bonds at low discount interest rates, considerable amounts of capital are tied up in the loan program.

Some argue that water projects could be financed just as easily with funds from the private sector and a grant from the state to buy the commercial rate down. One estimate indicates the need for water project financing in the state will exceed $2 billion over the next decade. According to agency officials, the state's water loan program has historically funded less than 25 percent of the total water project financing need. Some officials wonder where the money will come from to fund such demand. Financial professionals suggest that funding for these projects could come from the private market---it could be said that there is an unending supply of money available to local governments at the market rate of interest. They contend that through a cooperative effort, with the private sector providing the financing and the state providing the subsidy, most or all of the future demand for water project financing could be met.

The issues surrounding the water loan program are more easily understood if a clear distinction is made between financing approaches and funding methods. Financing approaches are techniques used by the boards in the water loan program to assist local governments in financing water development projects. Interest rate buy-downs and revolving-loans are the financing approaches focused on in this report. Funding methods are means used to supply capital to the water loan program. Historically, the Legislature has funded the water loan program through direct appropriations. Recently, however, three alternative funding methods have been proposed. Figure II shows the two main financing approaches discussed in this report in the left column and the proposed funding methods in the right column. Chapter II compares interest rate buy-downs and revolving-loans, discussing the advantages and disadvantages of each financing approach. Chapter III provides information about each of the proposed funding alternatives.

Figure II
Water Loan Program
Financing Approaches and Proposed Funding Methods

Financing Approaches	Proposed Funding Methods
Revolving-Loans	Trust Account Program
Interest Rate Buy Downs	Recapitalization Program
	Bond Bank

The water loan program is administered at the state agency level. Funding the water loan program occurs at the state level.

During the course of our study, we found that discussions concerning financing methods were often intermingled with discussions of funding for the program. For example, the water boards' main objection to the use of interest rate buy-downs is that subsidy grants deplete the program of funds and that additional funding may not be provided by the Legislature. However, financial experts point out that revolving-loans also deplete the program because low interest rate loans are in reality a "disguised grant." They note that a loss of capital occurs each time the state provides local governments with loans below the market rate. Under the revolving-loan approach, principal plus interest are returned to the fund on each loan, but the loans are made below the market rate which results in a loss of "purchasing power" over time. This is one reason why the revolving-loan approach is not self-funding and why additional appropriations are needed from the Legislature on a regular basis. One of the professed advantages to some of the proposed funding alternatives is they will provide a more permanent source of funding for the program.

Our study of the state's water loan program attempts to analyze the above issues in order to provide information to the Legislature so appropriate policy decisions can be made. Questions pertaining to whether the state should continue to subsidize water projects, the level of subsidy that should be provided, and which communities should receive a subsidy are unfortunately beyond the assigned scope of this study. Under the state's current policy, water projects are subsidized. The information contained in the remainder of this report is based on the assumption that water projects will continue to be subsidized. As a result, this report focuses on determining which method of financing allows the most projects to be developed for the state dollars spent, providing information to the Legislature on alternative means of funding the water loan program, and determining whether greater efficiency would result from consolidating the water boards.

Audit Scope and Objectives

Our office was asked to conduct a study of the state's water loan program to determine whether more projects could be financed by implementing an interest rate buy-down approach, whether alternative funding proposals have merit, and whether the four water loan boards should be consolidated. This report addresses the following issues:

- Financing approaches: This study will attempt to identify the advantages and disadvantages associated with the interest rate buy-down approach and the revolving-loan approach. Issues discussed include: whether more water projects can be financed through interest rate buy-downs or revolving-loans; which approach maintains the perpetuity of the program; and which approach provides the most efficient use of state dollars.

- Alternative funding methods: This study will explore the advantages and disadvantages of each proposed funding alternative.

- Consolidating the four water boards: This study will attempt to determine the amount of overlap that exists under the current program and whether greater efficiency could be achieved by consolidating the state's four water loan boards into a single board.

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Chapter II
Choice of Financing Approach is a Policy Issue

Our comparison of interest rate buy-downs versus revolving-loans concluded that in most situations interest rate buy-downs leverage state dollars to finance more projects. However, there are instances where revolving-loans are preferred to interest rate buy-downs. This is a complex issue and a number of factors need to be considered in order to determine which method of financing water projects is best. Basically, the decision of whether to emphasize buy-downs or revolving-loans as the primary financing approach in the state's water loan program is a policy decision to be determined by the Legislature. Issues surrounding the decision center on the intended objective for the program. Is the objective of the program to finance as many projects as possible? Should more projects be financed now or in the future? How much money should the state appropriate to the water loan program? Is the program currently large enough, too large, or not large enough? As the state continues to grow and the demand for water development projects increases, the objective of the program should be made clear and set forth in policy by the Legislature. The answer to these policy questions will determine whether the interest rate buy-down approach or the revolving-loan approach should be emphasized as the primary financing approach used in the state's water loan program.

It should be noted that the use of the term "emphasized" does not mean the exclusive use of one approach and the total exclusion of the other. Proponents of the buy-down approach recognize that there are situations where revolving-loans from the state better meet the needs of certain communities. Also, as noted later in this report, the water boards already use interest rate buy-downs on a limited basis to assist local governments. Nevertheless, under the current program the main emphasis is on using revolving-loans. The question this report attempts to answer is whether the emphasis should be shifted to interest rate buy-downs as the primary financing approach.

Proponents of the interest rate buy-down approach suggest that buy-downs can be used to expand the role of the private sector in financing water development projects while reducing the role of the state in this area of public finance. Under the buy-down approach, the majority of funds needed to finance water development in the state would come from the private sector instead of the state. Finance experts argue that the buy-down approach can be used to leverage state dollars to finance the construction of more projects. They also note that under the buy-down approach it takes fewer state dollars to finance the same number of projects as currently financed under the revolving-loan approach. Basically, when the demand for water projects is high, the buy-down approach can be used to stretch available state dollars to finance more projects and when the demand for water projects is low, the buy-down approach can be used to finance fewer projects and maintain a positive balance of funds in the program. In fact, if

funding for the program continues at its current level and the buy-down approach is used to finance the same level of projects currently financed, the balance of funds in the program would grow each year in perpetuity.

Under the revolving-loan approach, the state acts like a bank by providing loans to local governments for water projects. Those in favor of the revolving-loan approach believe revolving-loans maintain the perpetuity of the program because principle plus interest on loans is returned to the program. They also like the flexibility of revolving-loans because they are able to restructure loan payments or extend payment deadlines as necessary. They note that some local governments are unable to access the market to issue bonds for water projects. For these communities, loans from the state are their only means of financing water projects. Lastly, proponents of the revolving-loan approach suggest that having the state act as a bank eliminates the cost of underwriting, rating agencies, and disclosure statements that are required when communities issue bonds on the open market.

This chapter shows the results of our comparison between the interest rate buy-down approach and the revolving-loan approach. We have attempted to fairly present the advantages and disadvantages of each financing approach. Because the buy-down approach is a relatively new proposal, more explanation is given to how it operates and compares to the existing revolving-loan approach. In order to familiarize the reader with the two financing approaches, the following description of each approach is offered.

Revolving-Loan Approach: Under the revolving-loan approach, the state acts much like a bank, providing low interest rate loans to local governments for the purpose of financing water projects. Local governments in need of financial assistance apply to one of the four water boards for a loan. Board members use information gathered by agency staff pertaining to the need for the project, existing utility rates, and the community's financial strength to assist them in determining the appropriate interest rate on the loans. Historically, the interest rates charged on revolving-loans have ranged from 0 percent to just over 7 percent and have averaged about 2 to 5 percent below the prevailing market rate. Nearly half of the current outstanding loans have an interest rate of 0 percent. Loan amortization periods range from one year to more than 30 years. About 70 percent of the loan amortization periods are between 15 and 25 years with the 20-year amortization period being the most frequently used.

When local governments receive a loan from the one of the boards, they sell a bond to the state to secure the loan. The bond is sold to the state at the same interest rate as the interest rate of the loan. For example, if a local government receives a $2 million loan at 3 percent interest, it sells a $2 million 3 percent interest bond to the state for security on the loan. The state currently holds approximately $324 million in bonds issued by local governments for water projects. The Division of Finance manages the accounting for all bond payments and maintains all bond documents and other legal documents associated with the transaction.

The revolving-loan approach is currently funded through appropriations from the Legislature. Appropriations are made either directly from the general fund or by the state issuing general obligation bonds to fund the program. It should be noted that repayments from revolving-loans are returned to the loan program. They are not used to pay off the state's general obligation bonds. The general obligation bonds are paid off through a general fund appropriation; therefore, this funding mechanism acts just like a direct appropriation.

The revolving-loan approach was intended to be a source of permanent capital for making loans to political subdivisions of the state for water project development. As the principal plus interest is repaid on each loan, the program is replenished and the state is able to make additional loans. However, the program only grows in relation to the interest earned on each loan. The greater the subsidy, the fewer earnings from interest, the less growth in the fund. When interest rates on revolving-loans are below 4 percent, the program runs the risk of not keeping pace with inflation.

Interest Rate Buy-Down Approach: Under the interest rate buy-down approach, the state would only be used as a "lender of last resort" instead of the primary lender on water projects. (For the purpose of this report, an interest rate buy-down is an agreement between the state and a political subdivision for the purpose of reducing the overall cost of public water projects by subsidizing the net interest cost on bonds issued by political subdivisions on the open market.) The buy-down proposal calls for local governments to borrow money for water projects from private sector financial institutions. The state would provide assistance to local governments by giving them a financial grant to buy down the commercial interest rate to a more affordable level. The grant would be a gift from the state with no repayment required. The size of the grant would be negotiated between the local government and the water board based on the local government's need and ability to pay just as the interest rate is currently negotiated in the revolving-loan approach. It should be noted that the 1985 Legislature authorized the water boards to help local governments through credit guarantees and/or interest buy-downs.

An example of how the buy-down approach would operate can be seen in the financing of the Franklin Quest baseball field. Salt Lake City asked the Legislature for an $8 million loan to construct the stadium. However, instead of a loan, the Legislature appropriated to the city $1.8 million that was used to buy down the interest rate of a bond sold in the private sector. With the interest rate buy-down, the city was able to get financing in the private sector that was the economic equivalent of what they were asking for from the state. And the state was able to provide assistance to the city at a cost of $1.8 million instead having to raise $8 million for a loan.

Under the buy-down approach, the private sector will supply the capital needed to construct water projects and the state will supply the subsidy needed to buy the municipal rate down. Because the amount of money needed to finance a buy-down is considerably less than the amount needed to finance a loan, fewer state dollars are needed to finance each project. As a

result, the immediate use of state funds is minimized and either more projects can be financed now or funds allocated to the program will be used more slowly and last longer.

The water loan program has approximately $324 million in outstanding loans. Repayments from these loans will be paid to the program over roughly the next 20 to 25 years. For example, repayments in fiscal year 1996 are estimated to be about $14.7 million. Under the proposed buy-down approach, only a portion of the $14.7 million would be needed to finance the same number of projects as the revolving-loan approach. Funds not used for buy-downs could be used for other state projects such as highways or schools; or they could be kept in the water loan program and invested by the State Treasurer until they are needed; or they could be used to finance more water projects each year. If a conscious decision is made to finance more projects in any given year, all of the available funds will be given out in the form of grants. Under this scenario, no repayments will be made to the program. If the decision is made to finance more projects every year, additional appropriations would be needed to fund the program after the existing repayment stream runs out in 20 to 25 years. This illustration is intended to make clear that all state funds are used under the proposed buy-down approach only if a conscious decision is made to finance more projects. Conversely, because the cost of using buy-downs is less per project, if the decision is made not to finance more projects, it would require fewer appropriations to finance the same number of projects as would be financed under the revolving-loan approach.

The above illustration does not account for additional appropriations that would likely be made to the program over the next 20 years and beyond. According to the Utah Foundation, the Legislature appropriated approximately $120 million to the water loan program between 1978 and 1992. If this level of funding continues, the program will not be depleted of funds even if a decision is made to finance more projects under the buy-down approach.

Proponents of the interest rate buy-down approach indicate that the ideal program would have local governments issue voted general obligation bonds instead of non-voted revenue bonds to finance water projects. Most of the bonds currently purchased by the state to secure loans are revenue bonds. However, general obligation bonds normally receive a lower market interest rate than revenue bonds and they are less costly to issue. Therefore, the amount of state subsidy required to buy the rate down on a general obligation would be less. Obviously, it would be prudent for the state to buy the rate down from a lower initial interest rate. If the state was to redirect its loan program to emphasize interest rate buy-downs as the preferred financing tool, the state's dollars would stretch further and more projects could be financed if local governments were encouraged to issue general obligation bonds. Local bond professionals recommend voted general obligation bonds because they provide for citizen input into the process and bring the lowest net interest cost on the financing. A representative from one of the state's leading banks indicated that his bank would bid on all general obligation bonds issued by any local government in the state regardless of the size of the bond.

Interest Rate Buy-Downs Offer a Viable Alternative

Overall our study concluded that more projects can be financed with the interest rate buy-down approach than with the revolving-loan approach. However, a number of factors must be considered by the Legislature before making a decision on whether to emphasize the use of interest rate buy-downs or revolving-loans. Our study was conducted based on the assumption that the state will continue to subsidize water development projects and that there is more demand for state assistance than can currently be provided with available state dollars. Agency officials have reported that there is a backlog of projects waiting to receive state funding. Therefore, the focus of our study centers on determining which approach finances the most projects for the state dollars spent. Overall, our tests show that interest rate buy-downs outperform revolving-loans under most scenarios. We found that the interest rate buy-down approach will finance more projects depending on market conditions and how far the interest rate is bought down.

The water boards, however, are reluctant to endorse the use of interest rate buy-downs as the primary method of financing water projects. They are concerned because grants used to finance buy-downs are given away and not returned to the program. They believe grants used for buy-downs erode the perpetuity of the program. While this is true, our research found that revolving-loans at interest rates below the market rate also erode the perpetuity of the program. Overall, we concluded that each project must be evaluated with respect to market conditions, the local government's ability to access the market, and the availability of state funds.

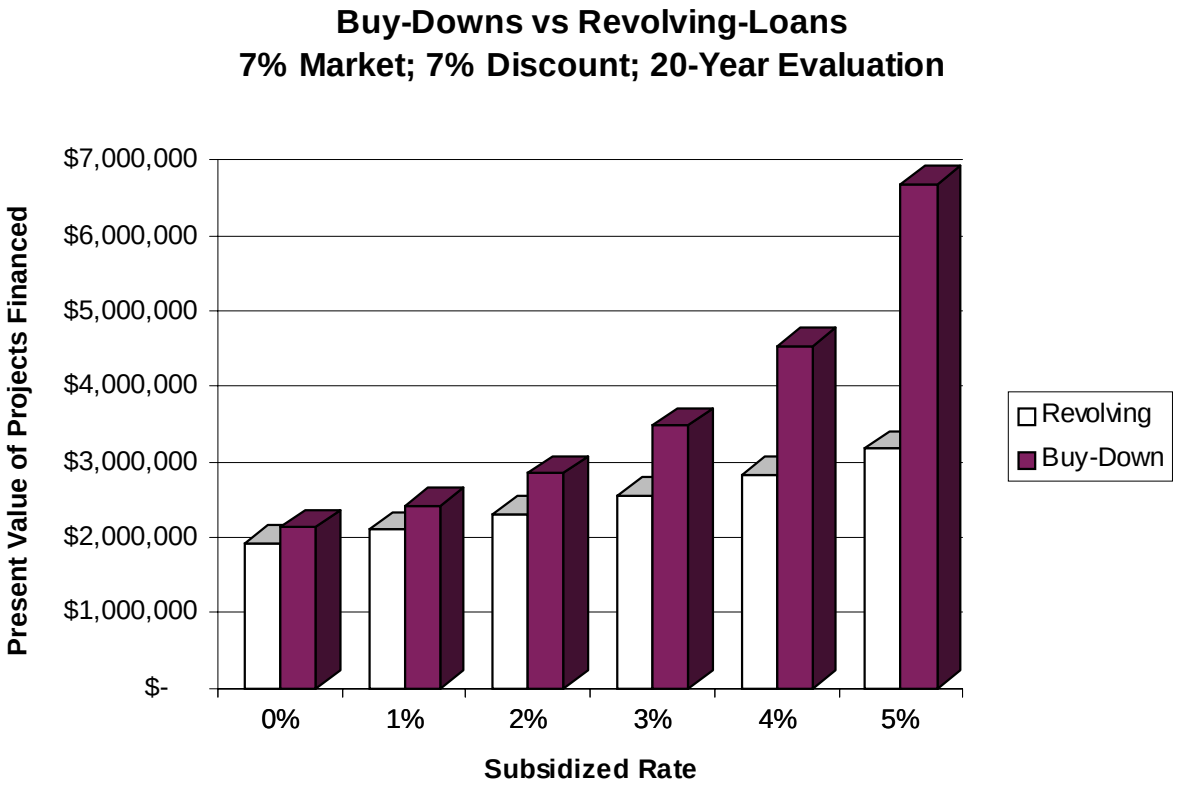
In order to compare the two approaches, we constructed a model designed to evaluate the performance of each financing approach. Our goal was to determine which approach finances the most projects for the state dollars spent. In order to accomplish this goal, we analyzed the performance of each alternative under a variety of different market conditions and scenarios. We contracted with James S. Schallheim, Ph.D., Department Chairman and Professor of Finance at the University of Utah, to assist us in developing a model to evaluate the two approaches. With his assistance, we constructed a model to calculate the present value of projects financed by each approach given the availability of $1 million in state funds. It should be noted that we also consulted with financial analysts from local investment banking firms and representatives of the Division of Water Quality while constructing the model. The assumptions used in developing the model are discussed in Appendix A.

Comparisons Show Buy-Downs Can Finance More Projects

The results of the analysis obtained from our model show that, given the same amount of state funding, the buy down approach will finance more projects than the revolving-loan approach over a 20-year period. Figure III compares the projects financed under each approach at subsidized rates ranging from 0 to 5 percent. The most frequently used interest rates under the current water loan program are 0 percent, 3 percent, and 5 percent with the average rate for the portfolio being approximately 2 percent. Subsidized interest rates are

shown along the bottom of the graph. The subsidized rate on revolving-loans is the below market rate of interest charged on the loans. The illustration shown in Figure III assumes a 7 percent market rate, a 7 percent discount rate and a 20-year evaluation period. (See page 20 for a discussion on the selection of an appropriate discount rate.) The present value of the projects financed over the 20-year period is shown along the left side of the graph. This example was selected for use in the body of our report because the market rate, discount rate, and loan terms closely reflect conditions at the time of this report. Appendices B, C, and D show the results of our analysis using 5, 9, and 12 percent market and discount rates.

FIGURE III



As shown in Figure III, the interest rate buy-down approach outperforms the revolving-loan approach under each scenario. At the 5 percent subsidized rate, the buy-down approach finances about $6.6 million in projects compared to about $3.1 million under the revolving-loan approach. This represents a difference of about $3.5 million, (more than 110%) more projects financed under the interest rate buy-down approach given $1 million in state funds. The buy-down approach finances $1.7 million (60%) more at the 4 percent subsidy level; over

$900,000 (37%) more at the 3 percent subsidy level; about $538,000 (23%) more at the 2

percent subsidy level; over $320,000 (15%) more at the 1 percent subsidy level; and just under $200,000 (10%) more at the 0 percent subsidy level. (Comparisons between the two approaches are discounted to the present value because cash flows occur over different time periods. Present value analysis allows cash flows occurring over different time periods to be evaluated on an equal basis.) The analysis showing how the model was used to calculate the present value of projects financed under the buy-down approach is detailed in Appendix E and the analysis showing how the model was used to calculate the present value of projects financed under the revolving-loan approach is detailed in Appendix F.

The projects financed under the revolving-loan approach shown in Figure III include the balance of funds remaining in the program. For example, at the 3 percent subsidy level the revolving-loan approach actually finances the present value of $2,166,006 in projects over 20 years. Adding the present value of the remaining payment ($376,373) accounts for the total of $2,542,379 shown in Figure III. The revolving-loan approach maintains a balance of funds in the program because principal plus interest on loans are returned to the program. In our analysis, payments coming into the program after the evaluation period need to be accounted for. For example, 20-year loans made in the 18th, 19th, and 20th time periods have repayments that come into the program after the 20-year evaluation period. We elected to add the present value of remaining payments to the projects financed in order to make a fair comparison of the total value of the revolving-loan approach.

Under the buy-down approach, at the 3 percent subsidy level, approximately $3.4 million worth of projects would be financed during the first year versus $2.5 million under the revolving-loan approach over 20 years. Local communities would sell approximately $3.4 worth of bonds on the open market and the state would give the local governments $1 million in grants to buy the interest rate on the bonds down from 7 percent to 3 percent. The state's $1 million would be leveraged to construct about $900,000 more in projects. In this example, all of the projects financed under the buy-down approach are constructed in the first year allowing communities to enjoy the use and benefit of the additional projects financed under the buy-down approach immediately. Under the revolving-loan approach, a $1 million project is constructed in the first year, a $62,819 project is constructed in the second year, and so on each year until after 20 years, $2.5 million in projects have been constructed.

In order to be clear, it should be pointed out that if buy-downs are used to finance more projects, funds in the program are depleted. In the above example, $1 million in state funds is given out in grants to local governments. No repayments will be returned to the program. More projects are financed, but no funds are maintained in the program. In a following section, we will show how the buy-down approach can be used to finance the same number of projects as the revolving-loan approach and maintain a balance of funds in the program. However, in this section the focus is on the fact that under the buy-down approach $1 million in state funds can be used to finance more projects in one year than the revolving-loan approach finances in 20 years. If the Legislature determines that water projects contribute value to local communities and to the state as a whole and that the objective of the water loan

program is to finance as many worthy projects as possible, then the buy-down approach should be considered.

Funding for the buy-down approach could come from existing loan repayments and/or Legislative appropriations. The state's water loan portfolio currently has approximately $324 million in outstanding loans that will be repaid over the next 20 to 25 years. In 1996, loan repayments are expected to be about $14.7 million. The majority of these repayments could be used to finance interest rate buy-downs over the next 20 to 25 years without any additional appropriations from the Legislature. However, it should also be noted that the Legislature has appropriated $196 million to the program since its inception. The Utah Foundation reports that the Legislature appropriated $120 million to the water loan program between 1978 and 1992. This equates to an average of about $8.6 million per year over a 14-year period. If the Legislature were to continue this level of funding, the buy-down approach could be used to finance water projects for as long as the Legislature desires to continue the water loan program.

The analysis showing that buy-downs can be used to finance more projects was based on the assumption that there is greater demand for state assistance on water projects than the water boards are currently able to meet. Agency officials have indicated that there is a backlog of requests from communities with water projects for state financing. In addition, Legislators have indicated that the water boards frequently ask for additional funding on the basis that they cannot meet the demand for state financing of water projects. As discussed on page 34, agency officials estimate that the demand for water projects will increase as the state continues to grow. Assuming the state will continue to subsidize water development, it seems logical to look for ways to leverage available state dollars to assist in financing as many projects as possible. However, this should not be taken to mean that all available funds have to be used in any given year or that unworthy projects should be financed.

Lastly, Figure III shows that when the subsidized rate is relatively close to the market rate, significantly more projects can be financed under the buy-down approach than the revolving-loan approach. Conversely, when the subsidized rate is closer to zero, fewer projects can be financed. This difference is a function of the "spread" between the market rate and the buy-down rate. The greater the spread between the market rate and the buy-down rate, the fewer projects financed. For example, buying the rate down from 7 percent to 0 percent (a 7 percent spread), costs more than 6 times the amount needed to buy the rate down from 7 percent to 6 percent (a 1 percent spread). The decision of how far to buy the interest rate down on a project must be evaluated in accordance with policies established by the water boards on a case-by-case basis. Factors such as the need for the project, current utility rates, and the community's financial strength must be taken into consideration.

Buy-Downs Could Have Financed $31 Million More Projects. In order to estimate the potential effect buy-downs could have on the number of projects financed in the state, we attempted to estimate the number of projects that would have been financed if interest rate buy-

downs had been used over the past two fiscal years. According to Division of Finance records, the state lent local governments about $88 million for water projects in fiscal years 1994 and 1995 (about $39 million in 1994 and $49 million in 1995). It should be noted that during these years, the Division of Water Quality received large appropriations from the federal government normally not available in other years. As a result, about 35% ($31 million) of the funds lent out in 1994 and 1995 are not eligible for use under the buy-down approach because of federal restrictions prohibiting the use of grants to finance interest rate buy-downs. However, if the remaining $57 million was used to buy the interest rate down on commercial loans from 7 percent to 2 percent, we estimate that about $31 million more projects could have been financed. In calculating this estimate, the following assumption was made. From fiscal year 1994 through fiscal year 1995, the interest rate charged on loans in the revolving-loan approach averaged about 2 percent. Bond underwriters reported that interest rates on the type and quality of bonds sold to the state during this period ranged between approximately 5.5 percent and 7.5 percent. We elected to use a conservative market rate of 7 percent in our analysis.

Obviously, the above estimate is crude and is only intended to provide the reader with a sense of the potential effect buy-downs could have on the state's water loan program. It is also intended to show the number of projects that could be financed using the repayment stream from the water loan program over the next several years without making any change in the way the program is currently funded. Admittedly the above estimate does not take into account the fact that some funds were lent to local governments that are unable to access the market. These funds would not be available for buy-downs and the communities would have to rely on the revolving-loan program.

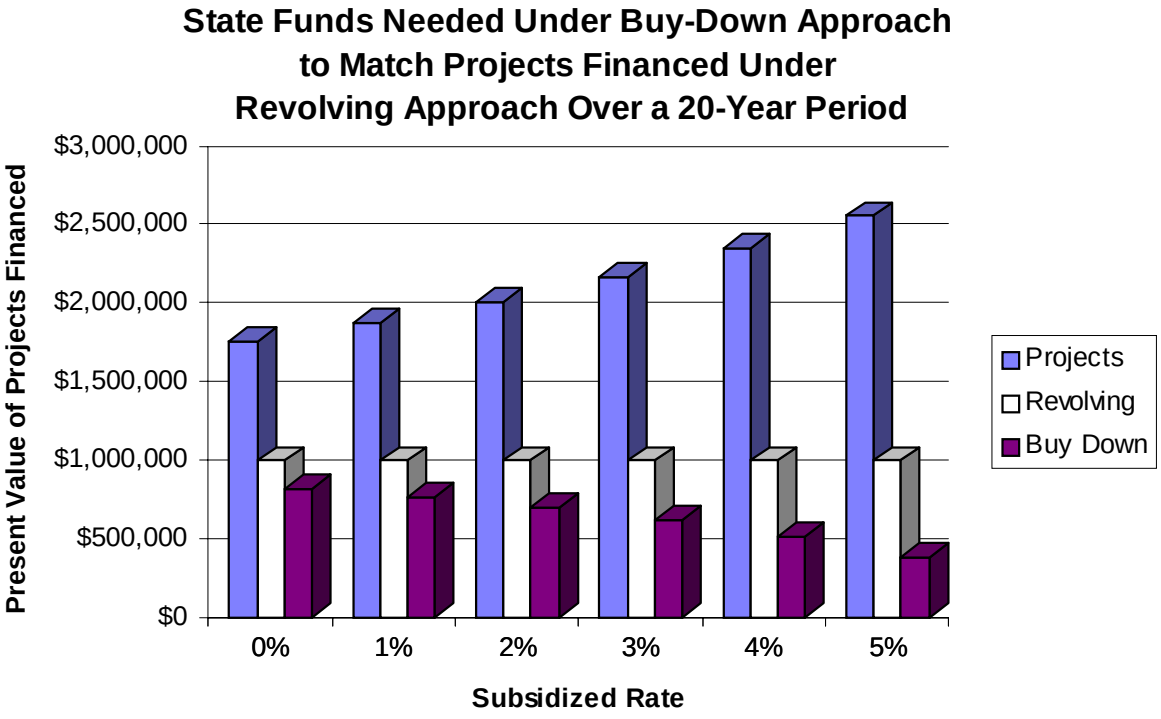
Agency officials indicate that our analysis does not include costs of issuance associated with issuing bonds on the open market. Issuance costs typically run about 1 to 2 percent of the bond amount. They argue that these fees will increase the overall cost of projects and reduce the number of projects financed if communities are required to issue bonds on the market under the buy-down approach. Issuance costs are fees charged by financial advisors, underwriters, bond attorneys, escrow agents, and so on. Some of the fees charged to issue bonds on the market are not charged under the revolving-loan approach. Agency officials estimate that the difference in cost could run as high as 1 to 2 percent of the loan amount. However, one of the investment bankers we talked to indicated that the difference would be closer to 0.05 to 0.75 percent. In either case, issuance costs in the range of 1 to 2 percent of the loan amount would not significantly affect the results of our analysis showing that the buy-down approach is capable of financing more projects than the revolving-loan approach. Moreover, our analysis of the number of projects financed under the revolving-loan approach does not include costs to the state associated with administering the revolving-loan program. If these costs were deducted from the funds available to the program, it would reduce the number of loans financed under the revolving-loan approach.

Buy-Downs Use Fewer State Dollars

to Finance the Same Number of Projects

Our analysis shows that the buy-down approach does not have to be used to finance more projects. Instead, it could be used to finance the same number of projects as currently financed under the revolving-loan approach but with fewer state dollars. If the intent of the Legislature is not to fund as many projects as possible or if fewer projects are approved by the water boards in any given year, the buy-down approach could still be used. This section is based on the assumption that the program's objective is to finance the current level of projects. Figure IV shows the number of projects financed under the revolving-loan approach given $1 million in state funding and compares the cost or state dollars needed to finance the same number of projects using the buy-down approach. The analysis shows the number of projects financed at each subsidy level over a 20-year period.

Figure IV



As shown in Figure IV, fewer state dollars are needed to finance the same number of projects under the buy-down approach. In figure IV, the number of projects financed at each subsidized rate is shown in grey. The cost of financing the projects under the revolving-loan approach is shown in white. And the cost of financing the projects under the buy-down approach is shown in black. For example, under the revolving-loan approach, $1 million in state funds is needed to finance $2.5 million in projects at the 5 percent subsidy level.

However, under the buy-down approach only $383,000 is needed to finance $2.5 million at the 5 percent subsidy level. Continuing the analysis, at all subsidy levels, $1 million is needed under the revolving-loan approach. However, under the buy-down approach $517,000 is needed to finance $2.3 million at the 4 percent level; $624,000 to finance $2.2 million at the 3 percent level; $707,000 to finance $2 million at the 2 percent level; $773,000 to finance $1.9 million at the 1 percent level; and $825,000 to finance $1.8 million at the 0 percent level. (This example only shows the present value of projects financed. The present value of remaining loan payments under the revolving-loan approach is not included in this example which accounts for the discrepancy in projects financed under the revolving-loan approach shown in Figure III).

Agency officials have expressed concern that unnecessary projects may be financed under the buy-down approach simply because the buy-down approach is capable of leveraging state dollars to finance more projects. However, having the ability to finance more projects does not necessarily mean that more projects should be financed. Proponents of the buy-down approach do not advocate financing unworthy or unnecessary projects. They recommend that the same guidelines currently used to qualify projects for state financing under the revolving-loan program be used to qualify projects for a grant under the buy-down approach. Projects that do not meet the standards set by the water boards should not receive state assistance. In any given year, the buy-down approach could be used to finance more projects or fewer projects depending on the objective of the program.

Because the buy-down approach is capable of financing the same number of projects as the revolving-loan approach with fewer state dollars, excess funds in the program could be used for other purposes or they could be retained in the program to build up a balance of funds. For example, under the buy-down approach, only a portion of each year's repayment stream from the $324 million loan portfolio would be needed to match the same number of projects as the revolving-loan approach. Funds not used for buy-downs could be used by the Legislature for other purposes such as building highways and schools or they could be invested by the State Treasurer until they are needed for water projects in future years.

In addition, because it costs less to finance the same number of projects under the buy-down approach, if the Legislature wants to decrease the current level of appropriations to the program, it could do so if the buy-down approach was used as the primary financing method. (As discussed later in the report, the revolving-loan approach is dependent on continued appropriations from the Legislature to maintain the program.) It should be made clear, however, that reducing the level of appropriations would only result in financing projects at the same level as the revolving-loan approach. It would not result in a balance of funds being maintained in the program. In order for there to be a balance of funds in the program, the buy-down approach must be funded at the same level and finance the same number of projects as the revolving-loan approach. The next section shows what would happen to the balance of

funds in the program if both approaches were funded at the same level and the funds not used

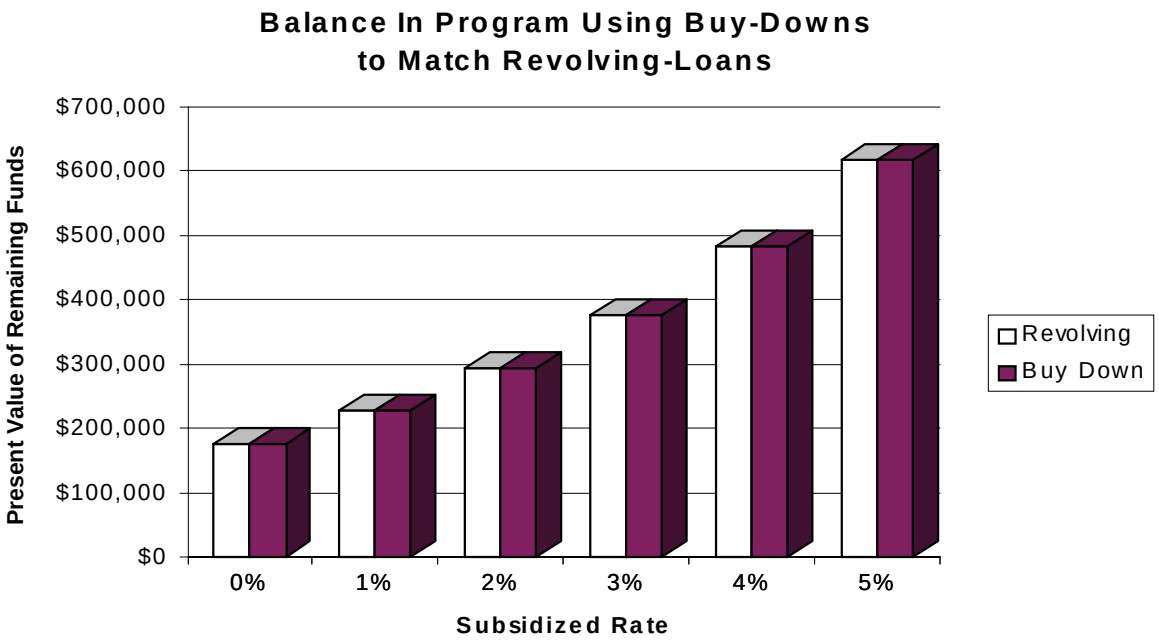
for buy-downs are invested at the market rate of interest over 20 years.

Buy-Downs can be Used to Maintain a Balance of Funds in the Program

One of the arguments against the interest rate buy-down approach is that if all available state funds are used to finance more projects today, funds will not be available to finance projects in the future. However, if the buy-down approach is used to match project for project the number of projects financed under the revolving-loan approach and all available funds are not used in the first year, a positive balance of funds could be maintained in the program. In fact, if both financing approaches receive the same level of state funding and finance the same number of projects over a 20-year period, the present value of funds remaining in the program will be exactly the same under both approaches. As noted in the previous section, at the 3 percent subsidy level, it would cost about $624,000 under the buy-down approach to match $2.2 million in projects financed with $1 million under the revolving-loan approach. After using $624,000 for interest rate buy-downs to finance projects, a balance of about $376,000 would be left over. The $376,000 remaining in the program under the buy-down approach is exactly the same as the present value of funds remaining in the program under the revolving-loan approach.

Figure V shows the present value of funds remaining in the program under each approach after 20 years if $1 million is allocated to both approaches. The analysis assumes the buy-down approach is used to match project for project the number of projects financed under the revolving-loan approach over a 20-year period and that the funds left over after the buy-down are invested at the market rate of 7 percent.

Figure V



As shown in Figure V, after 20 years of project matching, the buy-down approach has the same present value of funds remaining in the program as the revolving-loan approach at each level of subsidy. This exercise demonstrates the flexibility of the buy-down approach. All available funds can be used to finance more projects in years when there are a number of worthy projects. Or, if there are not enough worthy projects in any given year, buy-downs can be used to finance fewer projects and leftover funds could be used in other state programs or invested by the State Treasurer. Or, as shown above, if the objective of the program is to build up a large balance of funds in the program so that the program remains in perpetuity, the buy-down approach can be used to maintain exactly the same balance of funds in the program as the revolving-loan approach, provided that the buy-down approach is used to finance only the level of projects financed under the revolving-loan approach.

The reason the balance of funds in the program is the same under both approaches is because the amount of state subsidy given away under each approach is the same. There is no difference in the amount given away with a grant to buy the interest rate down from 7 percent to 3 percent (4 percent subsidy) versus the amount given away with a 3 percent loan in a 7 percent market (4 percent subsidy). Figure VI on page 27 shows the amount of subsidy given away on a $1 million revolving-loan at various interest rates below the market rate.

In order to assist the reader, we will walk through an example of how project matching results in a balance of funds under the buy-down approach. Appendix F details how (given $1

million in state funds, at the 3 percent subsidy level) the revolving-loan approach finances a $1 million project in the first year, a $67,216 project in the second year, and a $71,734 project in the third year and so on each year over 20 years. If $1 million in state funds is allocated to the buy-down approach to buy the market rate on projects down from 7 percent to 3 percent, it would cost $287,916 to finance a $1 million project in the first year. This would leave a balance of $712,084 in the program which, if invested at 7 percent, would grow to $761,930 by the end of the first year. At the beginning of the second year, it would cost $18,066 to buy the rate down on a $67,216 project, leaving leave a balance of $742,578 ($761,930 - $18,066) in the program which, if invested at the market rate would grow to $794,558 by the end of the second year. At the beginning of the third year, it would cost $20,654 to buy the rate down on a $71,734 project which would leave a balance of $773,904 ($794,558 - $20,654) in the program which, if invested at the market rate would grow to $$828,077 by the end of the third year. This process of matching and investing the balance of funds would continue year after year over the 20-year period. After 20 years, the program would have a balance of $1,361,162 which has a present value of $376,373 that is equal to the present value of the remaining payment streams in the revolving-loan program. Again, present value calculations are used to compare the two approaches because cash flows occur over different time periods.

Disagreement Exists Over Selection of an Appropriate Discount Rate

The discount rate is used in present value calculations to discount future cash flows (or projects) to their present value. Present value analysis puts cash flows occurring in varying time frames on an equal footing for comparison purposes. Economists and financial professionals have traditionally defined the discount rate as one's opportunity cost. It is the cost of foregoing the rate of return that could be earned on the best known investment alternative. In constructing our model, Professor Schallheim recommended that we use the market rate of interest as the discount rate. For the purpose of this report, the "market rate" is considered to be the rate of return that could be earned in the State Treasurer's long-term investment pool (typically invested in low-risk government securities) which is currently earning about 7 percent.

However, the water boards disagree with the use of the market rate as the discount rate. Agency officials from Water Resources and Drinking Water argued that the discount rate should be approximately 4 percent. Officials from Water Quality argued that the discount rate should be tied to the inflation rate on new construction stating, "Unlike financial institutions or businesses, the water boards only have the option of either providing financial assistance for water projects today or in the future. If there is a cost of the best opportunity foregone, the measurement of that cost should be the increase in construction costs which will have occurred if the construction of a water project is delayed or postponed." Based on the reported average inflation rate for the past 20 years, the Water Quality Board feels a present value discount rate of 5 percent is appropriate.

We asked Professor Schallheim to comment on the use of the inflation rate as a discount rate. He stated that he has not heard of the inflation rate being used as a discount rate. He said the fundamental problem with trying to use the inflation rate is that it does not satisfy the guiding principle of an opportunity cost of funds. There is no fund in which to invest that earns the rate of inflation. He remarked that it is probably more difficult to forecast the rate of inflation (or the rate of inflation for construction costs) than it is to forecast interest rates. At least with interest rates there is an enormous and highly liquid marketplace that determines the future rates. Professor Schallheim stated, "Given that long-term risk-free rates as of July 1995 are earning at least 7 percent, the state could expect to earn 7 percent on a large portfolio of funds. Therefore, 7 percent is the opportunity cost of funds and the appropriate discount rate." We asked the state financial advisors' opinion on the selection of an appropriate discount rate and he agreed that the market rate of interest is the appropriate discount rate.

In our opinion, the market rate of interest is the appropriate discount rate for this analysis. From a state agency perspective, funds appropriated to the water loan program are designated for use in the programs and cannot be invested long term in the market. However, from the Legislature's perspective, these funds (bonds and loan repayments) are assets of the state that have a number of different uses or investment alternatives. For example, they could be used to build highways or construct state buildings or they could be invested by the State Treasurer. Economist E.J. Mishan offers the following explanation for using the market rate as the discount rate when evaluating public projects, "Public expenditure of any kind can be increased only by displacing private expenditure to an equivalent amount… If the spending of $1 million by the public agency reduces current investment in the private sector by $1 million we should regard the returns that might have been earned on the $1 million, had it been left in the private investment sector, as the relevant opportunity that is forgone." (See Appendix G for additional excerpts from Mishan's discussion on choosing an appropriate discount rate for evaluating public projects).

During our discussions with agency officials, there was considerable debate over our use of the market rate as the discount rate for this analysis. Consequently, we contacted economists from the University of Utah (U of U), Utah State University (USU), and Brigham Young University (BYU), to comment on what the appropriate discount rate should be for this analysis. None of the economists supported the idea of using the inflation rate on new construction as the discount rate. They also indicated that assumptions used by the boards to calculate the 4 percent figure were incorrect. The economist from the U of U indicated that a range exists for the appropriate discount rate. He suggested that at the low end it would be the state's 20-year general obligation bond rate (currently 5.8 percent) and at the high end it would be the market rate (7 percent). The economist from USU maintained that the discount rate should be the state's 20-year general obligation bond rate adjusted upward to reflect the marginal tax rate which would be payable on nonexempt private bonds (5.8% x 1.35% = 7.8%). We contacted two economists from BYU. The first indicated that the discount rate should be the state's 20-year general obligation bond rate adjusted upward to reflect the marginal tax rate payable on nonexempt private bonds. However, he also indicated that the

rate earned in the State Treasurer's long-term investment pool would also be an acceptable discount rate for this analysis. The second economist from BYU stated that the market rate should be used as the discount rate for this analysis.

We also contacted two municipal bond experts from local investment banking firms and asked their opinion on the appropriate discount rate for this analysis. The first indicated that his firm would base the discount rate on the yield or price the bonds could be sold for---approximately 6.5 percent. The second indicated that his firm would use the market rate as the discount rate.

Lastly, all of the economists and both of the investment bankers we talked to indicated that the appropriate evaluation period for this analysis is 20 years. They stressed that the evaluation period must be tied to the cash flows from the typical 20-year loans and 20-year bonds held in the state's water loan portfolio. They also emphasized that this is not an analysis of costs and benefits associated with a project or the life of a project. It is an analysis of cash flows and the reinvestment of those cash flows. Therefore, the 20-year evaluation period is correct.

Based on our discussions with the above economists and investment bankers, we feel confident that our use of the market rate as the discount rate for this analysis is appropriate and that the analysis shown in Figure III is an accurate reflection of the two financing approaches under current market conditions.

The last analysis we performed with our model was to calculate how the two approaches performed over a longer period of time. For information purposes, we calculated the present value of projects financed under each approach over a 50-year time period. Our analysis over this time period found that the buy-down approach continues to finance more projects. Appendix H shows the comparison of the two programs over 50 years. It should be emphasized that the 50-year evaluation is only intended to provide the reader with a perspective on how the two approaches will perform over a longer period. From a financial perspective, the appropriate evaluation period is the 20-year evaluation because it is more closely tied to existing cash flows and the 20-year loan amortization periods.

Boards Have Used Interest Rate Buy-Downs in the Past

During the course of our study, agency officials and board members appeared hesitant to embrace the concept of using interest rate buy-downs as the primary mechanism for financing water projects although each of the four water boards have used interest rate buy-downs to assist local governments in the past. They have used interest rate buy-downs to finance water projects when sufficient funds were not available to provide a loan for the entire project and to have funds available to finance other projects. We asked agency officials to explain when and why they have used interest rate buy-downs. The following explanations were given from each board:

Water Resources Board: "The Board of Water Resources has participated in over 50 blended loans and interest rate buy-downs… The reason the Board participates in interest rate buy-downs is to allow it to have funds for other water projects. [In] the most recent example [the] project cost was over $20 million. The district requested a loan from the Board of Water Resources of $16 million. In order to fund the $16 million project, the Board would have to have dedicated all of the money available at that time, plus the next two years' repayments. To continue to fund other projects the Board chose to give a 0% interest loan of approximately $4.6 million for use in interest buy-down, buying the project interest rate down to 5%…"

It should be noted that of the 50 interest rate buy-downs the Board of Water Resources has participated in only one has involved the use of a grant to finance the buy-down. In the case where the grant was used, the project required about $17 million in financing. The board did not have $17 million for a loan. After careful deliberation, the board determined that a grant of approximately $1.6 million to buy the rate down to an affordable level was the only cost-effective method of providing assistance.

Water Quality Board: "The Water Quality Board has defined interest rate buy-down to mean any state financing which is combined with a publicly issued bond. Since the inception of the assistance program 13 interest rate buy-downs have been made by the Water Quality Board. The last interest rate buy-down made by the board was a blended method loan to [a local government]. The board authorized a 0% loan for $2.5 million which, when combined with a $5 million publicly issued bond resulted in a combined loan payment which met the program funding criteria. The board considered using an interest rate buy-down as opposed to a revolving-loan because the board had insufficient funds to fund the entire project as well as other needed projects on their planning list."

Drinking Water Board: "A successful IBD [interest rate buy down] candidate usually met the following criteria: A) The candidate's project was large and urgent in nature, B) the applicant could not afford to finance the entire project at open-market rates, C) the applicant's financing needs exceeded $1 million (an amount which could be raised on the public bond market in a cost-effective manner), and D) the market rates would cause the consumer's water bills to become unreasonable in the opinion of the Board. When the criteria listed above were met, the Board would authorize a loan at 0%, or some low figure, that when blended together with the public bond would result in a reasonable water rate. The working measure was 1.5% of the median adjusted gross income for the community. Recently, however, the Board as a rule has decided that low-interest loans provide a better match for the needs of the applicant and the state of Utah. The Board may occasionally make IBD loans in the future, but had decided some time ago to not make any IBD grants unless the applicant was especially worthy."

Community Impact Board: "On December 1, 1994, the Permanent Community Impact Fund Board authorized a grant to [a local governmental unit] in the amount of $1.2 million.

> Of that total grant amount, $1 million will be used by the District to pay a portion of cost of various projects within the boundaries of the District… The remaining $200,000 of the grant is to be used by the District to enable the District to 'buy down' the net effective interest rate payable by the District on $1 million of general obligation bonds . . . The minutes of the December 4, 1994, board meeting state, … The increased grant amount ($200,000) will be used to buy down the interest rate on an open market financing to approximately 3.0%. This financing mechanism will alleviate the need for the requested $1 million PCIFB loan and provide a savings of $800,000."

In conclusion, the buy-down approach offers the flexibility of financing more projects with available state dollars or financing the current level of projects with fewer state dollars. If the decision is made to finance more projects, the program will be depleted of funds after the current 20-year repayment stream runs out and additional appropriations would be required from the Legislature to maintain the program. If projects are financed at the same level, the buy-down approach can be used to build the balance of funds in the program and maintain the perpetuity of the program. Finally, if the Legislature elects to encourage the water boards to emphasize more frequent use of interest rate buy-downs, there will still be a need to maintain a revolving-loan program. This is because, as discussed in the next section, some communities are unable to access the market to issue bonds and federal restrictions are tied to some funds in the program. These and other advantages of the revolving-loan approach are discussed in the next section.

Advantages of the Revolving-Loan Approach

If the intent of the Legislature is to continue financing water projects at the current level, the revolving-loan approach offers the advantage of maintaining a balance of funds in the program and affords easy access to low interest rate loans to local governments. Proponents of the revolving-loan approach indicate that they prefer this method of financing because loan repayments sustain the program, provide greater flexibility to meet the individual circumstances of communities, and allow the program to subsidize borrowers in other ways beyond providing an interest subsidy. They suggest that some communities are unable to access the market to issue bonds and that many local governments prefer to go through the state's program because it is easier and more convenient than complying with market requirements. Agency officials report that the revolving-loan approach provides a subsidy simply by eliminating the costs of an underwriter, a credit rating agency and disclosure statements. Moreover, they indicate that revolving-loans also provide a subsidy by allowing communities to avoid complicated and costly tax law reporting required for tax exempt bonds.

Agency officials are hesitant to use the buy-down approach as the primary method of financing water projects because they believe grants used to finance buy-downs erode the perpetuity of the program. However, our analysis concluded that buy-downs only erode the program more quickly if they are used to finance more projects. Buy-downs do not erode the

program more quickly if they are used to finance the same number of projects as the revolving-loan approach. Basically, both approaches erode the program at the same rate if they are used to finance the same number of projects. The erosion that occurs from giving a loan at an interest rate below the market rate is identical to the erosion that occurs from giving a grant to finance a buy-down. In both cases, the erosion to the fund occurs the moment the loan is given or the moment the grant is given for a buy-down. Only if a decision is made to use buy-downs to finance more projects, is the rate of erosion accelerated.

Revolving-Loans Maintain the Perpetuity of the Program

Agency officials oppose the buy-down approach because grants used to finance interest rate buy-downs are not returned to the program. As one agency official remarked, "Interest rate buy-downs erode the perpetuity of the program because the money is given away and we never see it again." In a memo to the Water Quality Board, agency staff stated the following position regarding the use of interest rate buy-downs:

> It is staff's opinion that revolving-loans be used to the greatest extent possible in order to optimize the perpetuity of the fund. However, when the demand for assistance exceeds the supply of funds the method of financing which will fund the most projects should be considered. The primary factor used to make this determination was to maintain the longevity and perpetuity of the assistance program. The need for assistance for wastewater construction appears to be a need which will continue in perpetuity. It is obvious that if the Board were to make only grants within a period of time there would be no funds left to provide assistance.

Officials from each agency expressed concern that the water loan program will not survive if the Legislature mandates the use of interest rate buy-downs as the primary mechanism for assisting local communities with water projects. Their concern centers on whether the Legislature will authorize additional appropriations to maintain the program if all funds are given out as grants to finance interest rate buy-downs. They believe the revolving-loan approach offers security because principal plus interest is returned on each loan. Without a permanent or dedicated funding source for the program, it is understandable why agency officials and board members are reluctant to endorse the buy-down approach which they perceive will deplete the program.

Revolving-Loans Also Erode the Program: While it is true that interest rate buy-downs erode the perpetuity of the program, our analysis shows the same thing is also true of revolving-loans. Essentially the program is eroded each time the state provides local governments with a loan below the prevailing market rate of interest. The erosion that occurs under the revolving-loan approach can be seen by using our model to calculate the balance of funds in the program after 20- and 50-year periods. For example, under the revolving loan approach, at the 3 percent subsidy level, our model calculates the present value of funds remaining in the program is $376,373 after 20 years but only $120,390 after 50 years. As

seen, the present value of funds in the program declines each year as more and more loans are given out at below market rates of interest. If additional appropriations are not made to the program, the program will eventually be depleted.

Erosion of the fund occurs because bonds sold to the state by local governments to secure the loans are issued at interest rates below the market. For example, if the state gives a local government a loan for $1 million at 3 percent, the local government sells the state a $1 million bond at 3 percent to secure the loan. Unfortunately, bonds issued at interest rates below the prevailing market rate suffer a discount in value at the time they are issued. The program is eroded because the bonds are worth less than their face amount. Investors are unwilling to pay $1 million for a bond that pays only 3 percent when they could purchase a $1 million bond paying the market rate of 7 percent. Investment bankers calculate that investors would only be willing to pay about $712,000 for a $1 million, 3 percent bond held by the state.

Bond experts estimate the water loan program's bond portfolio could be sold for only about 50 to 70 percent of its outstanding balance. They stress, however, that the discount needed to sell the portfolio is not because the bonds are of poor quality, but is mainly the result of the real cost associated with giving loans at interest rates below the market rate. Investment bankers emphasize that the discount on the state's bond portfolio occurs the moment the state makes a loan below the market rate. Basically, the state suffers a loss with each subsidized loan. The loss is realized in the discount on the bonds held by the state to secure the loans. As one investment banker stated, "It is a myth to think that there is no cost to the state associated with giving subsidized loans. The revolving-loan approach is in reality a disguised grant program." The grant associated with making loans at interest rates below the market rate can be seen by calculating the present value or price of the bonds held by the state.

Figure VI shows the discount on a $1 million bond issued at various subsidized interest rates below the market rate. The subsidy or grant associated with the loan is shown in the far right column. The discount is calculated by subtracting the present value of the bond (price of the bond) from the face amount of the bond. As shown, if the state makes a $1 million loan to a local government at 0 percent, the subsidy associated with that loan equates to $470,299. The subsidy is shown for each additional rate.

Figure VI

Subsidy Associated With Bonds Issued At Interest Rates Below Market

Face Amount	Market Interest Rate	Interest Rate on Bond	Present Value	Subsidy
$1 million	7 %	0%	$529,701	$470,299
$1 million	7 %	1%	587,071	412,929
$1 million	7 %	2%	647,895	352,105
$1 million	7 %	3%	712,084	287,916
$1 million	7 %	4%	779,526	220,474
$1 million	7 %	5%	850,091	149,909
$1 million	7 %	6%	923,634	76,366

The above exercise should not be construed as a criticism of the state's water loan program. The program was intended to provide financial assistance to local governments and water users. This discussion simply points out the fact that there is a cost associated with providing below market rate loans and that the effect of providing these loans results in the erosion of the program. It also shows why the revolving-loan program is not self funding and why additional appropriations are needed from the Legislature on an ongoing basis to maintain the program.

Revolving-Loans Provide Assistance on Small Projects and Communities Unable to Access the Market

Other reasons agency officials give for preferring the revolving-loan approach are because a small percent of the state's communities are unable to access the market to issue bonds and because issuance costs (as a percent of total project costs) on small projects can be prohibitive. They note that some communities may not be able to access the market because they do not meet the credit or financial requirements required by the market. For these communities, the state may be the only option for financing water projects. Agency officials also believe the cost of accessing the market can be prohibitive on extremely small projects because many of the costs associated with issuing bonds are fixed costs. While the average cost associated with issuing bonds runs approximately 1 to 2 percent of the bond issue, investment bankers report that issuance costs on extremely small bond issues can run as high as 4 to 5 percent. However, representatives from two local investment banking firms we contacted noted that their firms

have purchased numerous small bonds on water projects from communities in other states. They indicated that practically all communities are capable of accessing the market, but the cost could be somewhat prohibitive on extremely small issues.

Agency officials report that costs associated with underwriters, rating agencies, and disclosure statements are eliminated under the revolving-loan approach because bonds are not issued and sold on the open market. In addition, costly tax law reporting requirements for tax exempt bonds are also eliminated. They report that eliminating these costs lowers the administrative expense associated with the revolving-loan approach. They report that disclosure statement costs are not a one-time cost. The community is required by the SEC to prepare a disclosure statement annually for the secondary market. The cost of putting a buyer and seller together is an additional cost which would not be necessary if the community received a state revolving-loan rather than a market loan combined with an interest rate buy-down. Further, closing costs of a market loan are generally tied to the amount of the loan, i.e., the larger the issue the higher the closing costs. Closing costs on state loans, while significantly lower, are also relatively fixed regardless of the size of the loan.

Revolving-Loans Allow More Flexibility: Agency officials report that at times, certain communities may need special financing arrangements that are unavailable in the market. The revolving-loan approach also allows the state some flexibility in assisting communities that may need unusual or unique financing terms. One agency official reported that on a few occasions they have needed to extend the payment period and restructure loan terms for communities unable to meet payment deadlines. Such flexibility is not always available in the market. In addition, local governments may experience emergency situations where assistance is needed immediately. In these cases, the state may be able to act quickly to facilitate short-term financing through revolving-loans. Some of the loans issued by the boards have special conditions that require additional debt payments if the community's revenue base increases. If the increase does not take place the debt payments will not increase and if unforeseen adverse conditions occur, the repayments can be restructured. Several mayors and city managers from communities that have received low interest rate revolving-loans indicated that the program was very beneficial and that the agencies were very helpful and easy to work with.

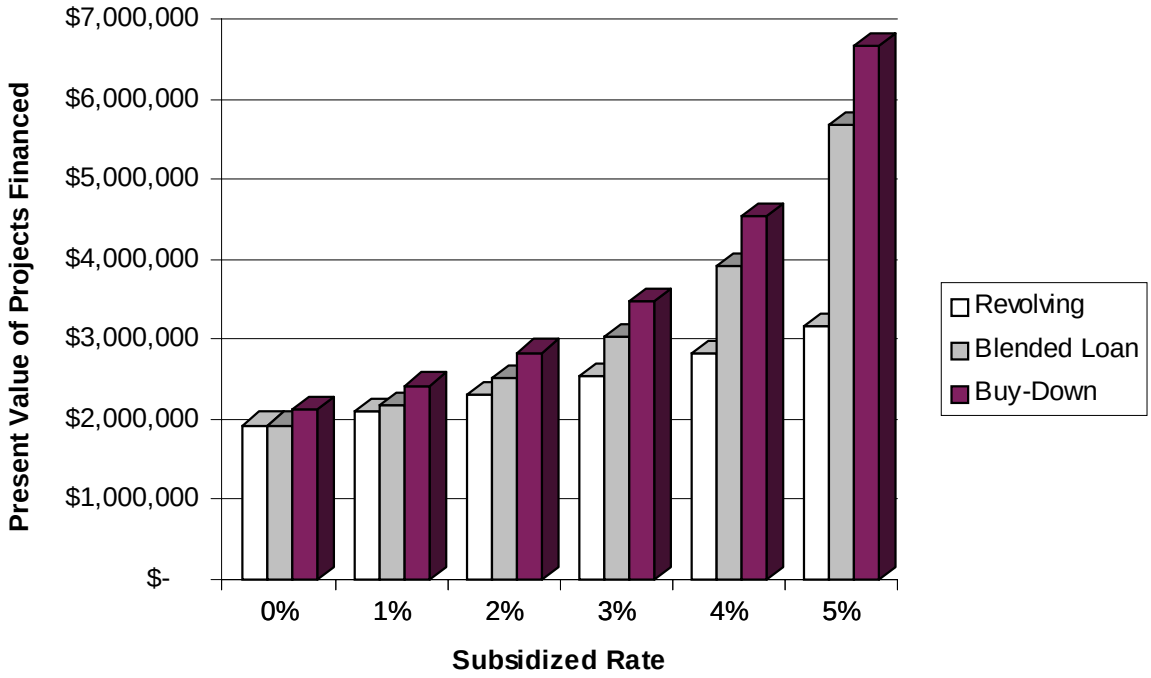
Federal Restrictions are Tied to Some Funds: According to officials from the Division of Water Quality, approximately $56 million of the Water Quality portfolio is tied to Environmental Protection Agency (EPA) funding or state matching funds to qualify for EPA funding. We contacted a representative of the EPA who indicated that their regulations do not specifically prohibit federal dollars from being used to buy down the interest rate on municipal bonds. However, regulations do strictly prohibit this money from being used in the form of a grant where it would not have to be paid back to the program. Therefore, an interest rate buy-down in the form of a grant is not allowed. These federal funds represent approximately 17 percent of the state's $324 million portfolio. Because federal restrictions prohibit the use of federal funds in the form of grants, these funds can only be used for revolving-loans and

represent another reason why a revolving-loan program will have to be maintained even if the buy-down approach is emphasized for other state funds in the program.

While it appears EPA dollars cannot be used in the form of a grant to finance interest rate buy downs, they can be used for 0 percent loans. According to bank officials, 0 percent loans are another form of interest rate buy-down. This financing technique is referred to as a "blended loan." Under this approach, water projects would be financed through a combination of local governments issuing bonds on the open market and the state supplying a 0 percent loan to help reduce the overall cost on the project. The water boards consider blended loans to be a form of interest rate buy-down and have used them in the past to assist local governments in financing water projects.

Our analysis found that in most situations, blended loans perform better than revolving-loans but not as well as the interest rate buy-downs. Figure VII compares blended loans to interest rate buy downs and revolving-loans. As shown, the blended loan approach outperforms the revolving-loan approach but does not perform as well as the interest rate buy-down approach where grants are used to reduce the municipal bond rate. In instances where federal funds are involved, it appears that these dollars can be used to finance more projects through the use of the blended loan approach.

FIGURE VII
Buy-Downs, Blended-Loans, & Revolving-Loans
7% Market; 7% Discount Rate; 20-Year Evaluation



Investment Banking Officer Position has not Been Filled

During our review we discovered that the boards have not filled an investment banking officer position authorized by the Legislature. **Utah Code** 63-65-3 declares that there is created within the office of the State Treasurer an investment banking officer to advise, counsel, and render technical assistance to authorizing agencies in the management of state loan and grant programs. Some of the duties of the investment banking officer would be to:

a) work cooperatively with the staff and boards of authorizing agencies as an advisor on technical financial aspects concerning loan and grant programs authorized by law;

b) coordinate procedures for the closing of and assist authorizing agencies in closing all loans and grants of funds or other subsidy agreements;

c) analyze, in conjunction with the appropriate authorizing agency, the financial feasibility and economic and capital efficiency of projects of authorizing agencies, review financing options, and make recommendations to each authorizing agency regarding

terms of loans or grants and levels of state subsidy in accordance with the financial feasibility of the project and the efficiency of available state capital;

d) coordinate and consolidate, to the extent possible, all financial and legal analysis of financing plans and closing of loans and grants made by each authorizing agency; and

e) provide an annual report of his activities to the State Treasurer, the governor, the Division of Finance, the boards of each authorizing agency, and the Legislature.

The investment banking officer position is to be funded by the four water boards. However, this position has never been filled. Evidently the boards have not viewed this position as necessary, which is odd since someone with expertise in investment banking would undoubtedly provide valuable assistance to the boards in determining the best financing approach for utilizing state dollars to finance more water projects.

Method of Financing is a Policy Issue

This chapter was intended to provide the Legislature with information on the advantages and disadvantages of the interest rate buy-down and the revolving-loan approaches. In conclusion, we found that the buy-down approach offers a viable alternative to the revolving-loan approach. The buy-down approach offers the advantage of utilizing the private sector to finance the majority of the state's water development projects. Our analysis of the buy-down approach found that more projects can be financed under the interest rate buy-down approach with the same amount of state funding; the buy-down approach can finance the same number of projects as the revolving-loan approach with fewer state dollars or fewer appropriations from the Legislature; and, lastly the buy-down approach can be used to maintain a balance of funds in the program if funded at the same level as the revolving-loan approach and only the current level of projects are financed. If the buy-down approach is selected as the primary method of financing water projects, a limited revolving-loan program will still have to be maintained for communities that are unable to access the market and for emergency situations.

The revolving-loan approach finances fewer projects than the buy-down approach, but maintains a balance of funds in the program. Under the revolving-loan approach, the state acts like a bank and offers the advantage of easy and convenient access to communities with water development projects. Also, for some communities unable to access the market, the state is the only option of financing water projects. In addition, state agencies are allowed more flexibility in extending payments and restructuring loan arrangements for local governments. Lastly some costs associated with accessing the market are eliminated under the revolving-loan approach. However, the costs associated with administering the revolving-loan program were not included in our analysis.

In final analysis, the question of whether to emphasize the use of interest rate buy-downs or revolving-loans as the primary mechanism for financing water projects is a policy issue that needs to be addressed by the Legislature. This ends our discussion on financing approaches. Chapter III will discuss alternative funding methods that have been proposed to supply capital to the water loan program.

Recommendations:

1. We recommend that the Legislature review its policy to determine whether interest rate buy-downs or revolving-loans should be emphasized as the primary method of providing assistance to local governments for water project development.

2. We recommend that the Legislature review **Utah Code** 63-65-3 to determine whether they feel the investment banking officer position is necessary. If it is determined that the position is necessary, we recommend that the water boards fill this position.

Chapter III
Alternative Funding Approaches Should be Considered

Demand for water projects in Utah's local communities has grown steadily since the inception of the state's water loan program. Factors such as population growth, increased federal regulations, and industrial development have all contributed to the increased demand. The Legislature is often faced with the dilemma of finding money to fund the water loan program. Since 1947, the Legislature has appropriated approximately $196 million to fund the water loan program. Undoubtedly, the demand will continue to increase as the state continues to grow. How the state provides funding for the water loan program is a policy issue to be decided by the Legislature. Questions facing the Legislature include how to meet future funding needs while being realistic about the amount of assistance that can be provided by the state and how much capital to dedicate to funding the water loan program. This chapter discusses alternative approach to funding the water loan program recommended by state officials and financial professionals which include: the trust approach, recapitalization, and bond banking.

Estimating future funding needs is difficult because a number of variables can influence the demand for new water projects. For example, changes in federal drinking water or waste-water regulations can result in a number of communities being out of compliance, which in turn results in demand for new projects. At a water summit conference held on November 15, 1994, the Director of the Division of Water Resources addressed the future funding needs for water and wastewater in the state:

> Based on the information that is currently available, it appears political subdivisions of the state and the agricultural community will spend an average of $160 million per year on infrastructure improvements for water, sewer, and agriculture projects. Add that to the amount I have described is needed to build large water development projects and there is a decade water development need of over $2 billion…
>
> Even though the state is currently providing substantial financial assistance (see table below), there is no evidence the need for future funding is going to decrease. In fact, the issue facing the Legislature and administration today is what should the state's funding role be in the future.

Estimated Future Annual State Cost Sharing Funds	
Municipal Water	$14 million
Wastewater	$13 million
Agriculture	7 million
Total	**$34 million**

Estimates from the other divisions support the need for future funding. The Division of Water Quality projects financing needs of approximately $20 million (in 1995 dollars) per year through the wastewater loan program. The Drinking Water Division expects applications for loans to exceed $12.5 million in 1996.

Proposed Funding Alternatives

The following section describes the alternative funding proposals referred to as the trust approach, recapitalization, and bond banking that have been proposed to meet some or all of the state's future funding needs for water development. This section will discuss how each proposal operates and its associated advantages and disadvantages.

Trust Approach. Under the trust approach, the state would liquidate its bond portfolio (the assets in the water loan program) and place the proceeds into a dedicated water trust fund, the principal of which could never be invaded. The water trust fund would be invested in high quality U.S. government bonds which would produce a dependable annual income from interest earnings. The amount of interest earnings generated from interest in the water trust fund could then be used for a permanent water project subsidy account. Under this proposal, the interest earned each year would be used to finance local government water projects. It should be noted that a small percentage of the interest earnings each year could also be used to make revolving-loans to communities that are unable to access the market.

The water trust fund would provide funding year after year in perpetuity as long as the principal remained in the trust account. In those instances where the private sector may be unable to make a loan to a local government because of credit quality or other legal restriction, the state could use a portion of the annual interest generated from the water trust fund as a "lender of last resort."

As noted in Figure I on page 2 the state currently holds approximately $324 million in bonds issued by local governments as security on revolving-loans. However, according to agency officials, approximately $56 million of the outstanding portfolio is ineligible for

liquidation because of federal restrictions and another $52 million [1] is ineligible for liquidation because their repayment streams have been pledged (recapitalized) to issue new revenue bonds. Excluding these amounts reduces the amount available for liquidation to approximately $216 million. Financial professionals are not certain about the exact liquidation value of the portfolio, but estimate that, depending on market conditions, it could be sold for between 50 and 70 percent ($108 million to $151 million) of the outstanding balance eligible for liquidation. Proceeds from the sale would be held in the water trust fund and invested by the State Treasurer in low-risk securities. The State Treasurer has indicated that the state could earn approximately 7 percent interest by investing these funds in long-term instruments. As discussed on pages 20 to 22, finance professionals emphasize that the discount needed to liquidate the bond portfolio is not a reflection on the quality of the bonds held by the state, but mainly a function of the discount associated with the original below market rate loans made by the state.

This $108 to $151 million water trust fund would generate between $7.5 and $10.5 million per year to fund interest rate buy-downs. Under current market conditions, the amount of projects that could annually be funded and subsidized with $7.5 to $10.5 million yield from the water trust fund would be approximately between $16 million and $70 million per year depending on the exact amount of the liquidation and how far interest rates are bought down from the market rate. (Buying the rate down from 7 percent to the portfolio's average rate of 2 percent, would result in approximately $21 to $30 million in projects financed each year.)

In addition to the interest earnings in the water trust fund, the Permanent Community Impact Board (CIB) is scheduled to receive approximately $12 million annually of new funds from mineral leases. The CIB typically allocates between 25 and 30 percent of its mineral lease money for water development. In fiscal year 1994, the CIB financed approximately $4 million in water projects. If these funds were combined with the trust fund earnings, the state would have approximately $11.5 to $14.5 million a year for water projects. Under current market conditions, if utilized in the interest buy-down approach, approximately $24 to $97 million in water projects could be financed each year, again depending on the liquidation amount and the buy-down rate used. (Buying the rate down from 7 percent to the portfolio's average rate of 2 percent, would result in approximately $33 to $41 million in projects financed each year.) It should be emphasized that this would be accomplished without any additional appropriation from the Legislature. However, should the actual amount of needed water projects in a given year exceed the amount that

[1] According to the state financial advisor, the $52 million in pledged bonds could be released by defeasing the newly issued revenue bonds. The defeasance could be accomplished by issuing new general obligation bonds to replace the revenue bonds. If the $52 million was released, $268 would be eligible for liquidation and could be sold for an estimated $134 to $188 million to generate between $9 and $13 million in interest earnings each year under the trust approach given current market conditions.

can be financed using the $11.5 to $14.5 million for buy downs, the Legislature may be asked to appropriate general fund money to accommodate the projected shortfall.

There are some concerns with the trust fund approach. One is that not all of the bonds held in the portfolio can be sold. In 1987, an unsuccessful attempt was made to liquidate some of the bonds. Problems arose with the sale because several of the bonds lacked sufficient legal documentation necessary to conform to market standards. Since that time, however, the state has strengthened its requirements and the quality of the bond portfolio has increased. Today, almost all of the bonds issued over the last 7 years could probably be sold without any problem. Approximately 59.7% ($246,880,240) of the portfolio has been issued since 1988.

One investment banker indicated that the state could significantly enhance the value of its portfolio (including many of the loans made prior to 1988) by enacting a legislatively authorized guarantee providing that the state would buy back any loan that exhibited legal or credit problems. This would not be a hardship on the state because it already has accepted this risk as the current owner of these bonds. By placing the state's guaranty on the portfolio of bonds sold, the state would recognize an immediate gain in its market value on the entire portfolio. The state of Utah is recognized on Wall Street as one of five states holding a "AAA" bond rating. If properly structured, the state's guarantee would qualify as a high grade credit risk, thereby enhancing the liquidation value of its portfolio.

Recapitalization Program. Because the state's revolving-loan approach acts like a bank, it has a loan portfolio in excess of $413 million in book value with $324 million outstanding. One of the ways for the state to provide for its needs is to do what many banks would do, which is to recirculate the loans on an accelerated basis rather than hold them to maturity. Recapitalization is a way of augmenting the amount of money available for the water loan program. Essentially, how recapitalization works is the repayment streams from the outstanding revolving-loans would be pledged as security to issue new revenue bonds. Proceeds from the sale of the revenue bonds are then used to finance new water projects. As the demand for funding increases, the state will need to appropriate more and more resources. If the state finds itself in a time of high demand on its capital resources for other needed projects within the state, the Legislature could direct the water boards to recapitalize their loan portfolio as the source of payment.

It should be noted that the authority for the boards to recapitalize already exists in statute but has rarely been used. In 1987, the Legislature provided this water revenue bond tool to the water loan programs. It authorized the State Treasurer to issue state water revenue bonds pledging the cash flow from existing loans to the repayment of the bonds. Bonds issued by the State Treasurer under this program are rated "AA" by Standard and Poors based on the state's "moral obligation pledge." From 1987 to the present, two issues of bonds have been sold, totaling approximately $23.9 million. At the present time, there are $19.1 million of these recapitalization revenue bonds

outstanding. The State Treasurer indicated that some problems occurred with the two previous recapitalizations when loans that were pledged were paid off early or refinanced during periods of low interest rates. Agency officials report that on one recapitalization this resulted in the pledged repayment stream being reduced, which required payments on the new bonds to be made up from other "non-pledged" sources. However, the recapitalizations did enable the water boards to recirculate funds to finance new water projects today.

In a time of tight state budget resources, the recapitalization approach will allow the state water boards to continue financing the water projects of local governments without having to infuse new capital into the program. Financial professionals indicate that the recapitalization revenue bond program may not meet all of the funding needs of the water boards, but if used skillfully, it can be an effective tool for stretching the resources currently available. Estimating the amount of funding that could be generated is a very technical and difficult process involving the matching of repayment streams with new bonds. Nevertheless, a rough estimate is that at least $20 to $30 million could be raised without a problem and perhaps as much as $100 million.

Bond Banks. Under the bond bank proposal, the state would use its superior credit rating to issue debt at lower interest rates on behalf of local governments to finance water projects. Because the state of Utah is rated "AAA" it has the ability to borrow at very favorable interest rates. The bond bank plan calls for the state to pass this low interest rate on to local governments, thus providing local governments with access to the markets at an interest rate below the rate they would be able to achieve on their own. Financial professionals estimate that the savings gained through the use of bond banking could lower the interest rate of local government borrowing on water projects by approximately 0.25 to 0.75 percent. Basically, the bond bank approach is simply a means of using the state's credit as a conduit for local governments to access the public markets at a lower rate of interest without costing the state anything. It could also be called a credit enhancement tool or a market access tool. Some other states that have used this approach include Nevada, Maine, and Alaska.

To illustrate how the bond bank plan works suppose that communities "A", "B", and "C" each need $5 million for water projects. Each community could issue bonds separately to finance their projects, or under the bond bank plan, the state would issue $15 million in general obligation bonds to finance all three projects. If the bonds issued by the communities were sold at 7 percent and the state's bonds could be sold at 6 percent, an interest rate savings of 1 percent would be achieved.

Some of the advantages of bond banks are fast funding turnaround in financing projects and simplified access to the bond market---particularly for smaller communities that cannot issue bonds themselves. Instead of each community issuing debt to finance water projects, the bonding needs of communities would be pooled and the state would issue a general

obligation bond to finance all projects once each year. Proceeds from the sale of the state's general obligation bond would be used to purchase local government water bonds issued at the same interest rate received by the state on the sale of its general obligation bond sale. Repayments from the local governments would be used to retire the state's general obligation bonds instead of being put back into the water loan program---as currently happens under the revolving-loan approach. Bond banks may issue or purchase either general obligation or revenue bonds, and accordingly will be backed by either a full faith and credit pledge or a revenue-based pledge or both. A bond bank approach would be especially productive for smaller communities who may feel they are unable to access the market.

One potential drawback to the bond bank approach is the effect issuing additional bonds could have on the state's credit rating. The state's bonding limit is about $1 billion. With approximately $400 million bonds outstanding, the state has about $600 million of additional debt incurring capacity. The state's financial advisor indicated that the state could easily issue another $100 million without affecting its AAA credit rating. However, issuing another $200 to $300 million may begin to weaken the state's credit rating. If bond banking is to be considered, the Legislature must determine how large a program the state should be involved in.

It should be noted that bond banking could be used in conjunction with the interest rate buy-down approach to lower the interest rate even further for local governments in need of additional assistance. The advantage of using the two programs in concert is the buy-down occurs from a lower initial rate meaning fewer state funds are needed to reach the desired subsidy level. For example, if a community needed a 2 percent loan in a 7 percent market, bond banking could be used to obtain a 6 percent rate and other funds could then be used to buy the rate down from 6 percent to 2 percent. Obviously, it makes more sense to buy the rate down from 6 percent than 7 percent. The net effect of this approach is a savings of 1 percent, achieved simply through the use of the state's credit rating to enhance the community's credit rating. Fewer state funds would be needed to buy the rate down to the desired level, thus allowing state dollars to be stretched further to assist in financing other projects.

Funding For Water Loan Program Is A Policy Issue

The question of how to fund the state's water loan program is a policy issue that should be addressed by the Legislature. In this chapter, we have attempted to provide the Legislature with information about alternative funding proposals that have been suggested by financial professionals and other interested parties.

Recommendations:

1. We recommend that the Legislature consider testing some or all of the above funding proposals on a limited basis to determine how they perform under real conditions.

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Chapter IV
Consolidation of Water Boards Would Probably not Result in Greater Efficiency

Consolidation of the state's four water loan program into a single agency and overseeing board does not appear necessary. Each agency has uniquely different responsibilities beyond providing money for construction of water projects which would make consolidation difficult. In addition, there are certain restrictions associated with federal money used by some of the agencies that also complicate the issue. And, though there is some duplication of services among the agencies on jointly funded projects, it is not significant in terms of either cost or frequency of occurrence. Moreover, we found coordination between the boards on jointly funded projects to be adequate, though some coordinating mechanisms established by the Legislature have not been fully utilized.

In our opinion it should be emphasized that if consolidation is to be considered at all, it should only be considered for the finance/loan function administered by the boards. Consolidating this function under a single oversight board may have merit, but there are also arguments against this course of action. In general, under the current program, local governments work with the same agency to satisfy regulatory and finance requirements on water projects. Removing the finance/loan function from the agencies and creating another level of government to administer the finance/loan function may not significantly improve the overall efficiency of the program.

We were asked to determine how similar the basic operations of each agency are and if significant overlap or duplication of duties exists. Concerns have been raised over the state's water loan program because four state agencies and four boards administer the water loan programs. This chapter addresses the issues of program consolidation and looks at the amount of overlapping responsibilities that exist among the agencies.

Program Consolidation Does Not Appear Necessary

Consolidation of the four water agencies into a single program is possible; however, it would probably not result in increased efficiency. There are at least two factors that complicate the consolidation issue. First, the provision of funds for water projects is just one of several diverse responsibilities assigned to each agency and only accounts for a relatively small portion of staff time. Second, some of the agencies use federal funds for water project development, and these funds are restricted as to how they can be used. Coordinating and maintaining distinct programs and specific funding restrictions would be difficult in a single, more generic water agency.

Each Water Agency Has Uniquely Different Responsibilities

All four water agencies administer different programs and have unique missions. For instance, the Division of Drinking Water is primarily concerned that community and state waters meet certain levels for purity and are fit for consumption. The Division of Water Quality is also concerned with water contamination issues, but primarily as they relate to water discharged back into the environment after use. In contrast, the Division of Water Resources deals largely with broad-scale water development, interstate stream issues, state water planning, and water conservation issues. The CIB, on the other hand, provides financial assistance to communities for a variety of projects, many of which are not water related, and has very diverse responsibilities. The following figure illustrates agency responsibilities and the staff levels associated with the water loan programs.

Figure VIII
Agency Responsibilities

Agency	Total Divisional Staff	FTEs in Water Loan Program (Percent)	Divisional Responsibilities Other Than Water Loan Prog. (Not necessarily a complete list of duties)
Community Impact Board	4	.6 (15%)	Provide financial assistance to political subdivisions of the state for: 1) planning; 2) the construction and maintenance of public facilities; and 3) the provision of public services.
Division of Drinking Water	22	.25 (5.7%)	1) Write and implement rules pertaining to state quality standards. 2) Evaluate water sample results. 3) Report results to the EPA. 4) Inspect and review new systems. 5) Provide technical assistance for water treatment.
Division of Water Quality	63	8.9 (14.1%)	1) Review plans for surface wastewater disposal systems. 2) Review plans for underground wastewater disposal systems. 3) Monitor the quality of Utah's water and waste-water discharge. 4) Develop and implement plans to protect Utah waters for its many uses. 5) Issue and enforce wastewater discharge permits.
Division of Water Resources	52	9.0 (17.3%)	1) Develop state water plan. 2) Promote water conservation through educational programs. 3) Coordinate intrastate stream issues. 4) Develop surface water of the Bear River and its tributaries. 5) Administer the state's cloud seeding program.

As shown in Figure VIII, each division has responsibility for several different types of programs, so consolidating entire agencies is not logical. This is especially true for the CIB within the Division of Community Development; the programs they administer are diverse and unrelated to water development, and they are the least likely of the four agencies to be a legitimate candidate for consolidation.

The perception of significant overlap between the water loan programs has raised the issue of possible consolidation. However, our analysis indicates the percent of staff time directly

related to the water loan program is small in each agency, only averaging about 14%. Even if just the loan program in each agency was somehow consolidated, increases in economy may not occur because the types of projects funded would still be diverse and require specialized attention.

Some Agencies are Limited by Federal Regulations

Consolidating the water loan programs is further complicated because some of the programs use federal funds and there are restrictions as to how this money can be spent. Applying the varying sets of regulations to comply with these restrictions would be difficult in a centralized agency.

For example, Water Quality has been granted "primacy" by the EPA to administer the "Clean Water Act." The Clean Water Act, originally passed by Congress in 1972 and last revised in 1987, was designed to promote the elimination of pollutant discharges in the nation's navigable waters and also the achievement of fishable and swimmable standards for these waters. "Primacy" essentially means the federal government has turned administration of the program over to the Water Quality Board. The board has also been granted more than $67 million from the federal government in its revolving-loan approach to assist cities in complying with the requirements of the Clean Water Act.

The Drinking Water Board has also been granted "primacy" by the EPA to administer the "Safe Drinking Water Act." The Safe Drinking Water Act was passed by Congress in 1974 and last revised in 1986, and is designed to ensure that "drinking water supplied to the public is safe and wholesome." Though the Division of Drinking Water has not been provided federal money in their loan program, Congress is now debating whether to grant funds to administer the Safe Drinking Water Act. Under a consolidated water program, the "primacy" issue would likely be difficult to resolve because the federal government may be reluctant to provide funds for very specific programs to a single, more generic water agency.

In addition to the "primacy" issues with Water Quality and Drinking Water, the Permanent Community Impact Fund administered by the CIB is funded completely by mineral lease revenues received from oil and mineral operations on federal lands within the state. Accordingly, there are certain stipulations as to exactly how and where this money can be spent. Even if the CIB was somehow able to consolidate its operation with the other agencies, these funds would have to be tracked separately, and dispersing the funds to meet the federal conditions might become complicated. Evidently the CIB has considered the idea of turning over a portion of its funds to the other three boards and not participating in the funding of water projects. However, this idea was evidently discouraged because the board feels responsible for maintaining control over these mineral lease royalties since this is their statutory charge.

As a final method of evaluating the practicality of program consolidation, we contacted

water loan officials in several western states to see how their programs operate. We found that with only one exception, all other states have several funding sources for water projects and are not consolidated into one agency. Figure IX shows how Utah's water loan program compares with those in other western states.

Figure IX
Water Loan Programs in Western States

State	No. of State Agencies Funding Water Projects	Types of Water Projects Funded	Are Projects Jointly Funded?
Arizona	1	Wastewater only	N/A
California	At least 5	Culinary, agricultural, waste-water, dams	Yes
Colorado	At least 3	Culinary, agricultural, waste-water, dams	No
Idaho	At least 2	Culinary, agricultural, waste-water, dams	Yes
Montana	At least 4	Culinary, agricultural, waste-water, dams	Yes
Nevada	At least 5	Culinary, agricultural, waste-water, dams	Yes
New Mexico	At least 3	Culinary, agricultural, waste-water, dams	Yes
Wyoming	At least 3	Culinary, agricultural, waste-water, dams	Yes
Utah	**4**	**Culinary, agricultural, waste-water, dams**	**Yes**

As Figure IX shows, every state but one has multiple sources of water project funding, and agencies within most states also participate in jointly funding water projects. According to an administrative officer over the revolving fund in the state of Arizona, there is no source of state funds for culinary or irrigation water projects or dam construction; loan money is only provided for wastewater development projects, and for this reason there is only one source. Only Idaho has two agencies that provide water loan financing; all other states have three or

more. This at least indicates that Utah is not out of the ordinary in terms of how its water loan programs are structured.

In our opinion, consolidation of the water loan programs would probably not result in significantly greater efficiency in the administration of the state's water program. Though some overlap of duties does exist, it does not appear to be significant, as discussed in the next section.

Duplication of Services Between Water Agencies Does Not Appear Significant

Although some duplication of services does exist, it does not appear to be significant in terms of either frequency of occurrence or dollars spent. Overall, we found that less than 8% of the water projects funded since 1990 involved an identifiable duplication of services as a result of receiving money from more than one water board. The estimated cost of overlap in terms of project feasibility studies conducted totaled about $10,000, which represents just over 2 percent of the total cost of feasibility studies over the 5-year period. It also appears that coordination between agencies over jointly funded projects is adequate, though some coordinating mechanisms may need to be reevaluated.

The Cost of Duplicated Services Does Not Appear Significant

Our analysis determined that the cost of duplicated services associated with jointly funded projects appears to be relatively insignificant. Of the approximately 313 projects funded since 1990, 23 (7.4%) were funded by more than one board where each board also conducted a separate feasibility study. We estimated the cost of duplicated feasibility studies associated with these projects to be less than $10,000 out of approximately $400,000 for the feasibility studies of all 313 (2.5%).

Projects are sometimes funded by two or more boards when a large amount of capital is necessary which cannot be practically supplied by a single board. However, the potential for overlap is limited because each board, with the exception of the CIB, is only authorized to fund certain types of projects. The Water Quality Board funds wastewater projects, the Drinking Water Board funds culinary water projects, and the Water Resources Board funds culinary water projects, irrigation water projects, and other water development projects.

The CIB has the most latitude of any board, but, as mentioned earlier, is less likely to be able to consolidate with the other boards because of the diversity of its functions. Figure X illustrates the types of projects funded by each board, excluding CIB, and the relationship with other boards.

Figure X
Types of Projects Funded By Each Board And Relation to Other Boards

Board	Types of Projects Funded	Jointly Funds Projects With
Water Quality Board	Wastewater treatment plants, facilities, and systems	Neither Drinking Water or Water Resources
Drinking Water Board	Culinary water systems including piping, wells, storage tanks, purification facilities, pumping stations, etc.	Culinary projects with Water Resources
Water Resources Board	Culinary water systems including piping, wells, storage tanks, purification facilities, pumping stations, etc.; dams, reservoirs, agricultural and irrigation systems, etc.	Culinary projects with Drinking Water

As seen above, the only potential for duplication of services among the three boards exists between the Drinking Water Board and the Water Resources Board in funding culinary water projects.

The Cost of Duplicated Feasibility Studies is Modest. The main area of overlap or duplication occurs when feasibility studies are performed by agency staff on projects proposed for joint funding. Feasibility studies are conducted to determine the technical and financial merit of proposed water projects, as well as to evaluate any health concerns that might necessitate the project. Staff engineers conduct this feasibility analysis which generally consists of reviewing the financial capabilities of the applicant, reviewing project specifications outlined in the applicant's engineering report, conducting site visits, and evaluating the project according to certain criteria established by the board.

In evaluating the cost of duplication, we made the assumption that one feasibility report would have sufficed for all agencies involved in a jointly funded project rather than each agency conducting its own study. We counted as necessary the cost of the most expensive feasibility study but considered the cost of any other feasibility study on the project as duplication. Admittedly, this assumption is imperfect because it doesn't recognize the extent to which each board may need separate and unique information for purposes of selecting projects

to fund. In addition, there are ongoing costs associated with a project beyond the feasibility report which we did not attempt to calculate because of the limitations of our analysis. However, we felt that the costs associated with conducting duplicate feasibility studies would provide a measurable basis for identifying the cost of overlap.

Each agency was asked to estimate the staff costs incurred in producing their feasibility studies. We were able to obtain actual costs from Water Resources, but had to rely on estimates from the other three agencies. (It should be noted that the CIB does not have an engineering staff to evaluate the feasibility of projects. When an application is submitted, the CIB contracts the feasibility study out to either Drinking Water or Water Quality depending on the type of project involved. When the CIB and Water Quality jointly fund a project, the same basic feasibility study is used by both boards and no duplication occurs. As a result, we eliminated six jointly funded projects between the CIB and Water Quality from our original sample of 29 jointly funded water projects. This left 23 jointly funded projects with duplicated feasibility studies.)

We analyzed the 23 projects and estimated that the cost of preparing all feasibility reports for those projects totaled approximately $52,000. The cost of preparing the second and sometimes third feasibility reports for the projects totaled about $10,000. If we assume the cost of the second and third reports was unnecessary, it only represents about 2.5% of the estimated cost of producing all feasibility reports for the 313 water projects funded since 1990. This leads us to believe that the extent of duplication between the agencies and the associated costs are relatively minimal.

It should also be noted that the Division of Water Resources and the Division of Drinking Water have reached a verbal agreement whereby they will no longer jointly fund projects needing less than a half million dollars. According to agency officials, this action was taken because they realize that it makes little sense for both to become involved in a project when one agency has all the necessary resources to meet the project's funding needs. As a result of this agreement, the number of projects jointly funded by Drinking Water and Water Resources should decline.

Adequate Control and Coordination Exist Between Agencies

Questions have been raised as to whether adequate coordination exists between the water agencies and if recipients of jointly funded projects receive more funding than necessary to complete their project. Our review found no evidence to support these concerns.

The loan files of the jointly funded projects we reviewed contained evidence that adequate coordination exists between the agencies. We found cost-sharing information in the loan files we reviewed showing all funding sources as well as funding amounts for each project. This was important information the boards considered in determining loan necessity and amount. In addition, we discovered several examples of other types of correspondence between

agencies in the project files such as one another's feasibility reports, copies of letters sent to the applicant, and statements requesting the release of funds to the applicant.

As one example of inter-agency coordination, we reviewed the CIB loan file for the Duchesne County Upper Country Water Improvement District project constructed in 1992. Because the project cost almost $9 million, the applicant had to seek funding from several sources: CIB, Water Resources, and Drinking Water all participated. In the CIB file we verified that the $2 million loans made by both Water Resources and Drinking Water for the project were documented on the staff review form, as well as funding from federal sources. In addition, the CIB file contained a copy of the Water Resources feasibility report which also documented all cost-sharing amounts from all sources.

To also promote coordination, the boards are structured so that overlap among board members exists. For instance, one member from each of the Water Resources and Water Quality Boards must also sit on the CIB as the official representative for their board. Also, the same individual representing the 5-County Association of Governments sits on both the Water Resources Board and the CIB. Lastly, one member of the Drinking Water Board sits on the Water Quality Board. This overlap of board membership helps promote the coordination of water project development issues in general as well as the joint funding of particular projects.

Finally, some centralization of functions between the agencies already does exist. For instance, all money available for funding water projects is managed, accounted for, and serviced centrally by the Division of Finance. The agencies also use the same bond attorney to review legal documents on all bonds sold to the state to secure loans. When projects are jointly funded, the money from each of the agencies is typically put into one escrow account where the money is managed and disbursed. The applicant submits receipts for reimbursement of project expenses, and a form must be signed by a designated person or persons from each agency involved in order for funds to be released. Based on the above information, it does not appear that consolidation of the boards would result in significantly greater efficiency; therefore, we do not recommend consolidation of the boards.

Coordinating Council is not Being Fully Utilized

In conclusion, we found that the boards have not fully utilized mechanisms created by the Legislature to help coordinate the financing and development of water projects in the state. **Utah Code** 73-10c establishes the Water Development Coordinating Council which comprises the directors from each of the four water agencies and the State Treasurer. The council's purpose is to:

a) coordinate the use and application of the funds available to the state to give financial assistance to political subdivisions of this state so as to promote the conservation, development, treatment, restoration, and protection of the waters of this state;

b) promote the coordination of the financial assistance programs administered by the state and the use of the financing alternative most economically advantageous to the state and its political subdivisions;

c) promote the consideration by the Board of Water Resources, Drinking Water Board, and Water Quality Board of regional solutions to the water and wastewater needs of individual political subdivisions of this state; and

d) assess the adequacy and needs of the state and its political subdivisions with respect to water-related infrastructures and advise the governor and the Legislature on those funding needs.

The council has not met on a regular, formal, basis for several years. In addition, we did not find a record of any council minutes documenting how jointly funded water projects are coordinated. Apparently, the boards feel the council is not necessary for coordinating water development issues. The purpose of the council may need to be reevaluated by the Legislature.

Recommendations:

1. We recommend that the Legislature review **Utah Code** 73-10c to determine whether the coordinating council is necessary. If the Legislature determines it is necessary, we recommend that the water boards take action to better utilize the coordinating council.

Appendices

Appendix A
Assumptions Used In Developing Model

Loan Terms: Loan terms were assumed to be 20 years. Our study found that 20-year loan amortization periods are the most frequently used by the water boards. Over the last 5 years, approximately 23 percent of the loans had 20-year amortization periods with 70 percent of the loans having amortization periods between 15 and 25 years.

Funds Available: For our test model we assumed $1 million in state funds was made available to each program. Under the interest rate buy-down approach, the entire $1 million is given out as grants to finance interest rate buy-downs. Under the revolving-loan approach, the $1 million is lent out in the first year and as repayments of principle plus interest are made in subsequent years they are lent out each year for the length of the evaluation period.

In our model, the available $1 million is used to finance as many projects as possible in the first year under the buy-down approach. However, in making this assumption, we do not mean to imply that all projects that would normally be financed over the next 20 years under the existing program should be financed immediately or that all funds currently available in the water loan program should be used immediately. In our opinion, the state should only assist in financing projects that are necessary and that meet established guidelines. Regardless of which financing approach is used, state assistance should only be given for projects meeting the requirements established by the water boards.

As noted earlier, the water loan program has approximately $324 million in loans outstanding. Repayments on these loans will continue for the next 20 to 25 years. In 1996, loan repayments are anticipated to be approximately $14.7 million. If the Legislature elects to emphasize the use of the buy-down approach, annual loan repayments could be used to finance buy-downs until the existing repayment stream is exhausted.

Market Interest Rate: Interest is the compensation paid or to be paid for the use of money. Interest is generally expressed as an annual percentage rate. The interest rate is the price paid to borrow capital. Determinants of the market interest rate are the real rate of interest (the desired rate of return), an inflation premium, a default risk premium, a liquidity premium, and a maturity risk premium. In general, the market interest rate is the current cost of using money. If a loan is made below that cost, a financial loss occurs. For the purpose of this report, the market rate is considered to be the rate of return that could be earned in the State Treasurer's long-term investment pool. State funds in this pool are typically invested in relatively low-risk long-term government securities. The State Treasurer reported that in the current market he could earn approximately 7 percent interest in this pool.

Remaining Payments: Under the revolving-loan approach, payments continue to come in after the evaluation period has ended. For example, in a 20-year evaluation assuming 20-year amortization periods for each loan, a loan made in the 15th year will have payments coming in for an additional 15 years after the evaluation period has ended. The remaining payments were discounted to the present value and added to the total present value of the projects financed during the evaluation period.

Discount Rate: The discount rate is the opportunity cost of capital or the rate that can be earned on the best known investment alternative. From the Legislature's point of view, state funds that are appropriated to the water loan program have a number of different opportunities. The funds could be used for other state programs or invested by the State Treasurer. The market rate of interest was selected as the discount rate in our model. A discussion on the opportunity cost associated with state funds in the water loan program and the choice of an appropriate discount rate begins on page 20 of this report.

Subsidized Interest Rate: The subsidized rate is the rate of interest charged on loans under the revolving-loan approach and/or the rate that the market rate of interest is bought down to under the interest rate buy-down approach. For example, under the revolving-loan approach, if the market rate is 7 percent and a loan is given at 3 percent, the subsidized rate is 3 percent and the amount of the subsidy is 4 percentage points. Likewise, under the buy-down approach, if the market rate is 7 percent and the rate is bought down to 3 percent, the subsidized rate is 3 percent and the amount of the buy-down is 4 percent.

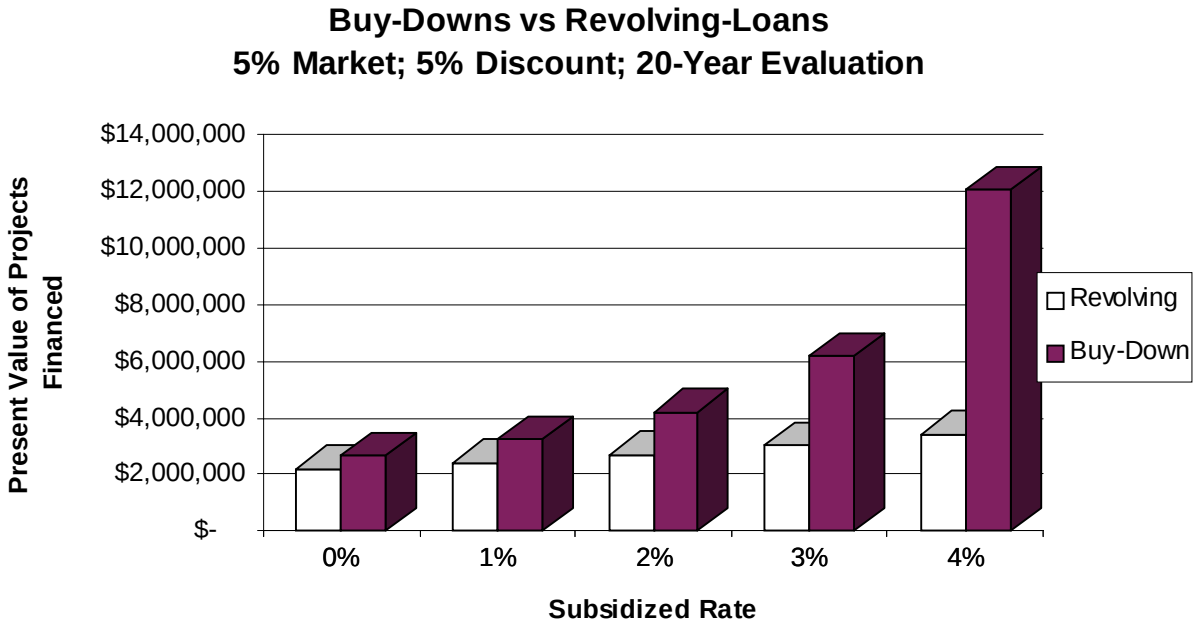
Present Value: The concept of present value is an economic theory designed to account for the time value of money and the opportunity cost of money. Present value calculations pose the question, "What would $100 payable in 10 years be worth today?" The answer depends upon the rate at which money could be invested. Assuming it could be invested at a 6 percent rate of interest, the value today of $100 to be received 10 years from now is $55.84. In our model, future projects and future cash flows are discounted to their present value.

Evaluation Period: We used our model to evaluate the performance of each financing approach over 20, 30, 40, and 50-year periods. However, questions arose over which evaluation period was most appropriate. We opted for the 20-year evaluation on the basis that it was the most frequently used amortization period in the water loan program. The investment bankers and economists we spoke to agreed with our decision. They indicated that when evaluating investment opportunities or financing alternatives such as interest rate buy-downs and revolving-loans, it is correct to tie the evaluation period to the cash flow period. They emphasized that this is not an analysis of the life of a project, but an analysis of financing approaches based on cash flows over a specific period. Since 70 percent of the loan amortization periods in the water loan program are between 15 and 25 years, with the 20-year loan amortization being the most frequently used, they agreed that a 20-year evaluation period would be appropriate for our comparison.

The question of how long to carry out the evaluation period also relates to the question of planning. For how far in the future do we plan? Businesses typically plan for 1 or 2 years in advance. Some businesses may develop 5- or 10-year business plans. Governments may plan for longer periods. In our report, we use a 20-year evaluation period for the reasons stated above. We also show in Appendix H a 50-year evaluation period (for information purposes only) to show how the two financing approaches perform over a longer period of time. We emphasize, however, that these evaluation periods should not be viewed as a recommendation for planning purposes.

Appendix B
Comparison at 5 Percent

Appendix B shows the results of our analysis assuming a 5 percent market rate and a 5 percent discount rate over 20 years given $1 million in state funds. As shown, the interest rate buy-down approach out performs the revolving-loan approach.

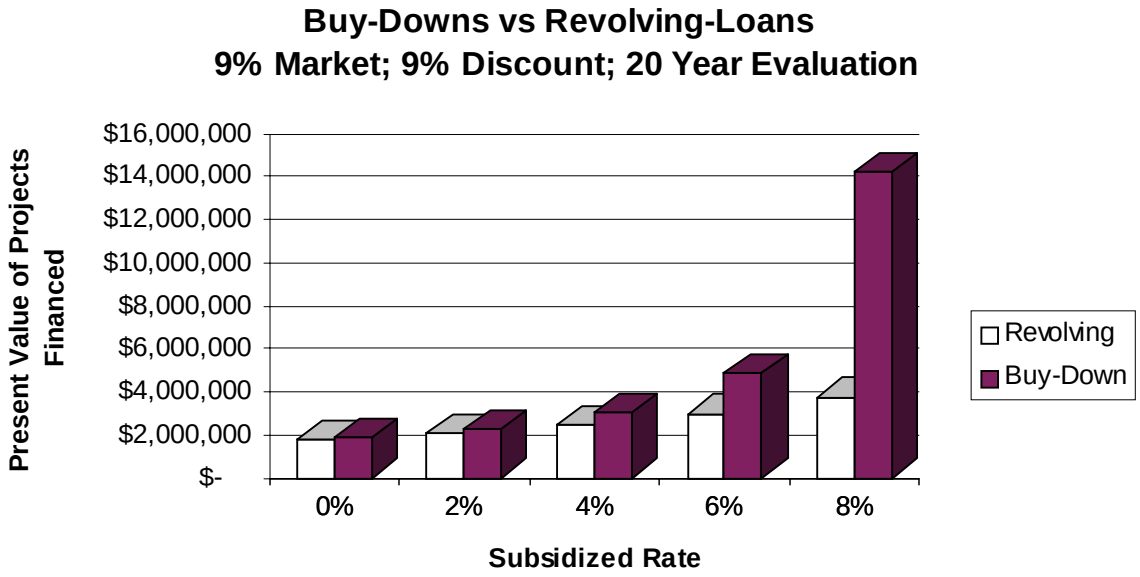


Present Value of Projects Financed

Subsidized Rate	0%	1%	2%	3%	4%
Buy-Downs	$2,653,298	$3,232,034	$4,204,293	$6,159,771	$12,046,923
Revolving-loans	$2,186,877	$2,416,199	$2,691,301	$3,021,757	$3,419,167
Difference	$466,421	$815,835	$1,512,992	$3,138,013	$8,627,756
Increase in Projects Financed With Buy-Downs	21%	34%	56%	104%	252%

Appendix C
Comparison at 9 Percent

Appendix C shows the results of our analysis assuming a 9 percent market rate and 9 percent discount rate over 20 years given $1 million in state funds. As shown, the interest rate buy-down approach out performs the revolving-loan approach. For convenience purposes, only the even subsidized rates are shown in Appendix C.



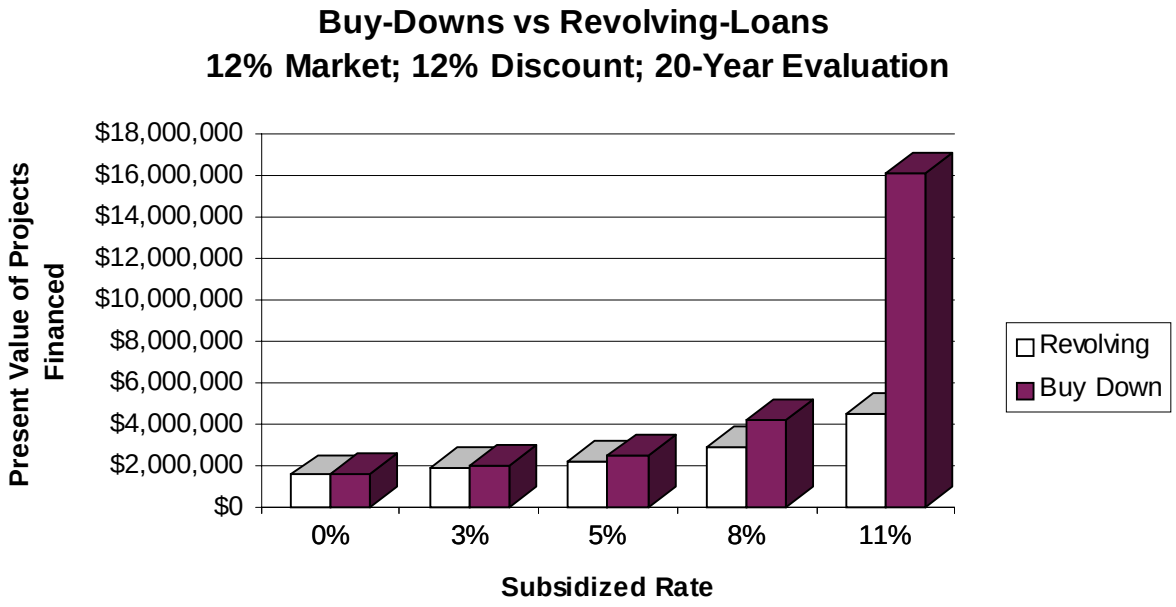
Present Value of Projects Financed

Subsidized Rate	0%	2%	4%	6%	8%
Buy-Downs	$1,839,680	$2,263,836	$3,045,942	$4,898,796	$14,237,417
Revolving-loans	$1,746,563	$2,030,845	$2,425,824	$2,977,664	$3,752,411
Difference	$93,117	$232,991	$620,118	$1,921,132	$10,485,006
Increase in Projects Financed With Buy-Downs	5%	11%	26%	65%	279%

Appendix D

Comparison at 12 Percent

Appendix D shows the results of our analysis assuming a 12 percent market rate and 12 percent discount rate over 20 years given $1 million in state funds. As shown, the interest rate buy-down approach out performs the revolving-loan approach. For convenience purposes, only select subsidized rates are shown in Appendix D.



Present Value of Projects Financed

Subsidized Rate	0%	3%	5%	8%	11%
Buy-Downs	$1,596,098	$2,008,290	$2,496,053	$4,180,241	$16,123,867
Revolving-loans	$1,561,970	$1,885,904	$2,200,319	$2,900,110	$4,543,152
Difference	$34,128	$122,386	$295,734	$1,280,131	$11,580,715
Increase in Projects Financed With Buy-Downs	2%	6%	13%	44%	255%

Appendix E
Calculation of Projects Financed Under Buy-Down Approach
$1 Million in State Funds; 7% Market Rate;
7% Discount Rate; 20-Year Evaluation

Buy-Down Rate	Payment of $1 Million Loan at Various Subsidized Rates	Present Value of Payment Stream Discounted Over 20 Years At 7%	Cost of Buy-Down	Leveraging Ratio	Projects Financed
0%	$50,000	$529,701	$470,299	.47030	$2,126,306
1%	$55,415	$587,071	$412,929	.41293	$2,421,722
2%	$61,157	$647,895	$352,105	.35210	$2,840,063
3%	$67,216	$712,084	$287,916	.28792	$3,473,237
4%	$73,582	$779,526	$220,474	.22047	$4,535,684
5%	$80,243	$850,091	$149,909	.14991	$6,670,719
6%	$87,185	$923,634	$76,366	.07637	$13,094,908

Example at 3%: Payment on $1 million at 3% over 20 years = $67,157. Present Value of $67,157 payment stream discounted at 7% over 20 years = $712,084. Take $1 million and subtract a payment stream of $712,084 = cost of buy-down $287,916. In other words, it would cost $287,916 to buy the rate down from 7% to 3% on a 20-year bond or loan. This results in a leveraging ratio of .28792 ($287,916 / $1 million). The projects that could be financed by spending all $1 million are $1 million divided by the leveraging ratio = $3,473,237.

Appendix G
Discussion on Choosing an Appropriate Discount Rate

The following discussion on choosing an appropriate discount rate for evaluating public projects is taken from Chapter 33, What Rate of Discount Should Be Used?, E.J. Mishan, "Cost-Benefit Analysis" published in 1976 by Prager Publishers.

> Let us set the stage in a competitive full-employment economy, one in which, therefore, public expenditure of any kind can be increased only by displacing private expenditure to an equivalent amount. Let *p* be the annual yield on a dollar of private investment expected with certainty, and let *r* be the social rate of time preference known with certainty. If *p* is equal to *r*, no problem arises: any stream of future outlays or benefits is to be discounted to a present value using either *r* or *p*. If *p* is greater than *r*, however, which is the usual case, the question arises whether---or, rather, under what conditions---*r* or *p*, or something in between, should be adopted as the appropriate rate for discounting the stream of benefits of a public investment. In general terms the answer depends upon the alternative opportunities open to the funds that are to be used by the public agency when undertaking a specific investment, and these opportunities in turn may depend upon how the funds are raised and upon the administrative or, ultimately, the political constraints that are imposed upon the use of funds…
>
> ….we shall assume that the use of any funds by the public agency for its investment programme reduces private expenditure in any one of the following ways: a) it reduces private investment expenditure only, b) it reduces current consumption only, or c) it reduces both private investment and consumption expenditure in know proportions . . .
>
> Suppose first that constraint I is operative---the funds allotted to the public agency [or Legislature] may be used in any advantageous way the agency [or Legislature] chooses---what is the appropriate discount rate under alternatives (a), (b), and (c)?
>
> (a) If the spending of $1 million by the public agency [or Legislature] reduces current investment in the private sector by $1 million, we should regard the returns that might have been earned on the $1 million, had it been left in the private investment sector, as the relevant opportunity that is forgone…
>
> …there is economic justification for the public project only if at the end of n years the compounded terminal value of its benefits, B1,B2,…,Bn, amounts to more than $1m.(1+*p*)n. However, if the $1 million invested in the public project does yield a terminal benefit in excess of $1m.(1+*p*)n then, when discounted to the present at the rate *p*, its value will be larger than $1 million. It follows that only if the present value

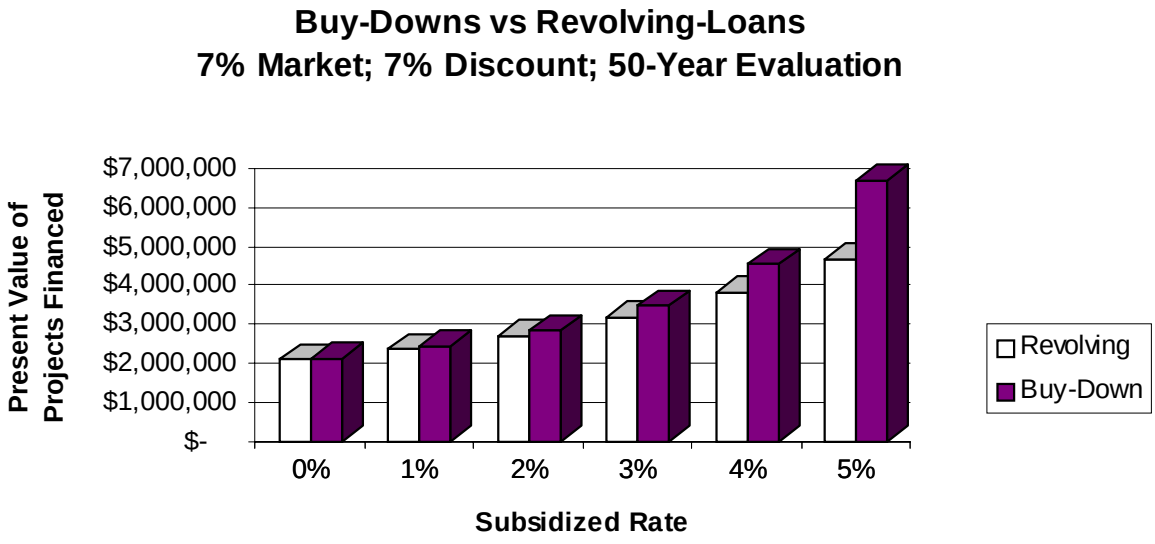
of the public investment stream of benefits when discounted at p exceeds the initial outlay of $1 million is there economic justification for the agency's undertaking it.

For the (a) case, we conclude, p [the annual yield on a dollar of private investment] is to be used as the appropriate opportunity rate of discount and, therefore, PVp(B) K, is the appropriate investment criterion for any initial outlay K.

Now the logic of the (a) case wherever the I constraint is operative can be extended to cases (b) and (c). For though it is true that if the public agency spends $1 million on the public project such an expenditure will reduce either private investment or private consumption expenditure or both, it is nonetheless also true that the largest terminal value that will be forgone by the public agency [or Legislature] in not undertaking the public project remains, as in the (a) case, that obtained by investing the $1 million in the private investment sector and wholly reinvesting all returns until the nth year. In cases (b) and (c), therefore, the agency [or Legislature] also has the option of accumulating a sum $1m.$(1+p)$n in n years' time by investing $1 million in the private investment sector, and it will invest the $1 million in the public project only if it can yield more than this. Again, therefore, the appropriate investment criterion is PVp(B) K, for any initial outlay K.

Appendix H
Comparison Over 50 Years

Appendix H shows the results of our analysis assuming a 7 percent market rate and 7 percent discount rate over 50 years given $1 million in state funds. As shown, the interest rate buy-down approach out performs the revolving-loan approach. After 50 years, the number of projects financed under the revolving-loan approach at 0 and 1 percent subsidy levels are closer to the number financed under the buy-down approach but do not surpass the buy-down approach. At subsidized rates closer to the market rate, the buy-down approach continues to significantly outperform the revolving-loan approach.



Present Value of Projects Financed (In Millions)

Rate	0%	1%	2%	3%	4%	5%
Buy-Downs	2.13	2.42	2.84	3.47	4.54	6.67
Revolving	$2.10	$2.36	$2.71	$3.18	$3.81	$4.68
Difference	.03	.06	.130	.290	.730	1.99
Increase With Buy-Downs	1.4%	2.5%	4.8%	9.1%	19.1%	42.5%

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Agency Response