WATER MANAGEMENT REPORT

FOR THE

BEAR RIVER GROUND WATER MANAGEMENT AREA

Submitted to the Director, Idaho Department of Water Resources

by the

Bear River Water Management Advisory Committee

September 4, 2002

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ACKNOWLEDGMENTS

This report was prepared by the Bear River Management Advisory Committee (the "Committee") (see Appendix A) at the request of the Director of the Idaho Department of Water Resources ("IDWR") with assistance and input from others involved with ground water mitigation issues in the Bear River Basin (the "Basin"). The members of the Committee and others dedicated substantial time and effort in evaluating the issues, options and strategies reflected in this report. The Committee extends its appreciation to Helen Harrington, IDWR project leader, and the other participants for their commitment to the planning process and to the long-term sustainability of the Basin's surface and ground water resources.

QUALIFIERS

The committee members acknowledge that some issues may exceed IDWR's authority or responsibilities. However, the committee members believe that these issues should be mentioned because the unique nature of the Bear River Basin dictates that these issues are relevant to the overall water picture.

The Committee also acknowledges that there remain differing opinions and interpretations of the Basin's complex geology and hydrology. The Committee was not requested to address geology or hydrology, but rather to assist the Director of IDWR (the "Director") in preparation of a management plan for the Bear River Ground Water Management Area. This report does not address local water interference issues.

INTRODUCTION TO THE REPORT

On August 12, 2001, the Director of the Idaho Department of Water Resources (the "IDWR") issued the "Order Designating the Bear River Ground Water Management Area," (the "Order"). The Order issued established the Bear River Ground Water Management Area ("GWMA") and created an advisory committee to "provide guidance in the preparation of a management plan " (Order, Paragraph 4b) to the Director. The following items were identified for the committee to consider (Order No. 3):

a. The requirements and conditions needed to protect existing water rights as applications for new consumptive uses from ground water are approved;

b. The need for policies to encourage development and use of water supply systems to provide water for multiple ownership subdivisions rather than individual wells for each residence or business;

c. Appropriate requirements for measuring and reporting of water withdrawals by new and existing uses from surface and ground water sources;

d. The need to designate areas of drilling concern to protect ground water quantity and quality.

Beginning in January 2002 and continuing through August, the Bear River Water Management Advisory Committee ("Committee") met monthly. The following recommendations resulted from those meetings. It is intended that this report provide the Director with a strategy and mechanism to process water right applications that have been held without action and to act on new applications. The Committee is willing to remain available to the Director and the Department for the purpose of providing further recommendations or input relating to the adoption, implementation and use of the Water Management Plan and other basin water issues.

Terms and phrases used in this report are based on the definitions found in the Idaho Code, IDWR Rules and the Bear River Compact.

ISSUE 1: MITIGATION PLAN

INTRODUCTION

The Committee provides these recommendations to the Director in evaluating applications for new ground water rights while appropriately mitigating depletion to existing water rights in the Bear River Basin. This portion of the Water Management Report for the Bear River Ground Water Management Area ("Report") includes a suggested procedure for approving water rights in the Ground Water Management Area; a proposed process for developing, reviewing and approving mitigation plans; and a menu of mitigation options.

Under Idaho law, both surface and ground water are public resources, which are "declared to be the property of the state." (Idaho Code §§ 42-101 and 42-226 (2001)). All new water uses require permits issued by the IDWR, excepting domestic purposes and in-stream livestock use as defined by Idaho Code §42-111,113. In deciding whether to approve applications for new water rights, the Director must first determine (Idaho Code § 42-203A (2001)):

- whether the proposed use will "reduce the quantity of water under existing water rights,"
- whether the source of water "is insufficient for the purpose for which it is sought to be appropriated,"
- whether the application is made "in good faith" or is "speculative" in nature,
- whether the applicant has "sufficient financial resources to complete the work" involved in appropriating the water,
- whether the appropriation "will conflict with the local public interest", or
- whether the appropriation is "contrary to conservation of water resources within the State of Idaho."

A key element of the public interest review is a determination that new uses will not injure earlier priority water rights.

The Order issued by the Director determined that surface and ground water in the Bear River Basin are interconnected, and that "Diversion and use of ground water for new consumptive purposes in the Bear River Basin generally reduces the amount of surface water available to supply prior water rights." Order, Finding of Fact 5.

The Order found that:

> There is surplus and unappropriated surface water and ground water in the Bear River Basin in Idaho. However, at times during nearly every year, the flow of the Bear River is not adequate to satisfy all existing water rights from the river. Because surface flows are generally fully appropriated during the peak irrigation demand periods, and additional depletion caused by ground water withdrawals will further reduce flows to the river and various springs, it is anticipated that new appropriations from ground water will need to provide replacement water or other mitigation to prevent or compensate for injury to existing rights from hydraulically connected surface water sources (Order, Finding of Fact 10).

Further:

> Policy 1F of the State Water Plan dated January 1997, as adopted by the Idaho Water Resource Board and ratified by the Idaho Legislature, provides that:
>
> It is the policy of Idaho that where evidence of hydrologic connection exists between ground and surface water, that they be managed as a single resource. (Order, Conclusion of Law 6.)

BACKGROUND

The source of water supply for future growth in the Bear River Basin will be dependent upon ground water and the development of storage facilities. The Director has already found that new groundwater uses will injure senior rights at some times. Thus, the new ground water use is considered as though it were a surface water right for the purposes of determining water availability, and under Idaho law, it must be conjunctively managed with other water rights. Where the surface water is already fully appropriated, as is the Bear River Basin for much of the year, the new ground water use must be denied unless the depletion to surface water is mitigated.

With appropriate mitigation measures in place, new ground water rights may be approved and utilized. Mitigation measures may also be used to avoid or offset depletion to existing senior water rights. In this manner, mitigation becomes a tool for allowing new development to occur without harm to senior rights.

Consistent with paragraph 5 of the Order, the Committee agrees that this Report should apply to applications for new ground water permits currently pending before the IDWR as well as future applications for new ground water permits. Paragraph 5 provides that "all applications proposing new consumptive uses of ground water, whether now pending or filed in the future, are to be held without action to approve or deny until a management plan is adopted as herein provided." [1]

OVERVIEW OF THE MITIGATION REPORT

This Report is built upon the general principle that ground water development will deplete surface flow. Therefore, new ground water development must fully mitigate the amount depleted in order for the IDWR to issue new permits. It is intended to suggest a road map for meeting mitigation requirements. It includes Mitigation Goals and Standards as well as a description of the process to be followed by applicants and the IDWR in evaluating mitigation proposals.

MITIGATION GOALS

1. To protect existing water rights from depletion when new or pending consumptive use ground water applications are approved.
2. To accommodate projected growth and water demand in the Basin in a way that does not injure senior water rights while allowing the development of storage to utilize water under the Bear River Compact.
3. To encourage and allow for innovative and flexible strategies for making water available for mitigation purposes including new storage, rental pool, transfers of water rights and other marketing mechanisms.
4. To provide a simple and effective road map for new applicants to understand the process to acquire a new water right and know what will be expected.

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[1] "As of August 10, 2001, thirty-five (35) applications for permit to appropriate water are pending in the Department's Administrative Basins 11 and 13. Of these, six (6) applications for permit proposing irrigation or other consumptive uses are pending in Administrative Basin 11 and nine (9) applications for permit for such purposes are pending in Basin 13. Most of these applications have been protested by the Petitioners and other holders of senior priority water rights alleging injury due to the reduction in the amount of water available to the protestants' senior priority rights." Order, Finding of Fact 7.

MITIGATION STANDARDS

1. Mitigation offering replacement water for a new ground water permit must result in measurable water delivered to the Bear River or its tributaries, including Bear Lake from its tributaries in the Lower Division. Mitigation for development in the Central Division must originate from sources in the Central Division as defined in the Bear River Compact and future amendments.
2. Mitigation and development of new ground water uses must go hand-in-hand. The approved mitigation must be in place before ground water use begins and mitigation must continue for the life of the permit and subsequently licensed water right.
3. Mitigation offering replacement water shall equal or exceed the amount of depletion of the new ground water right as approved by the IDWR. Depletion shall be treated as follows:
   A. The maximum depletion based on the water right offered as mitigation shall be calculated using the standards under which the yield of the mitigation water right would be evaluated by the IDWR if a transfer for the mitigation water right was sought, taking into consideration the priority of the water right, the availability of measurable water for use as mitigation, the sole supply of the water right, and other factors.
   B. The maximum depletion of the new water right equals the maximum mitigation requirement. Depletion of the new water right under the permit and the licensed water right cannot exceed this amount.
4. For domestic, commercial, municipal or industrial ("DCMI") permits that will be developed over an extended period of time, a schedule for implementation of the mitigation requirement will be developed to match use increasing over time. Such an implementation schedule must be presented to and approved by the IDWR as part of the mitigation plan before the application for permit is approved.
5. Mitigation in the Lower Division will result in replacement of stream flow to Bear Lake or at any location on the Bear River or its surface tributaries between the confluence of the Bear Lake Outlet Canal and the mainstem of the Bear River and the Idaho-Utah State line. Mitigation in the Central Division will result in replacement of stream flow to the Bear River or its tributaries in the Central Division.
6. Implementation and maintenance of a Mitigation Plan and compliance with any permit conditions are the responsibilities of the permit holder. The State will monitor compliance with permit conditions, the effectiveness of mitigation measures, and the cumulative effect of

individual permits. Non-maintenance of the mitigation should constitute a violation of the permit or the licensed water right and should subject the permit or license holder to enforcement by the appropriate water master.

7. Permits and licensed water rights should include conditions requiring installation and maintenance of measuring devices and to require measurement and reporting of water withdrawals in accordance with Chapter 7, Title 42, Idaho Code.
8. If a mitigation project is developed by or on behalf of a specific permit or licensed water right holder, ongoing maintenance of that mitigation project should be the responsibility of that permit or water right holder .
9. Mitigation and depletion standards should be uniformly measured and applied to all applications by the depletion estimation methods approved by the Bear River Commission (Duty of Water Under the Bear River Compact: Field Verification of Empirical Methods for Estimating Depletion, Utah Agricultural Experiment Station, Utah State University Research Report 125, by Hill et al, 1989), IDWR standards or other methods adopted by the Director in the final Ground Water Management Plan. The committee recommends that IDWR develop a chart of depletion amounts for various uses and make it available to the public to aid in planning new water development.

ALTERNATIVES TO NEW GROUND WATER DEVELOPMENT

Applicants for new ground water permits will be encouraged to first consider alternate sources of supply or strategies to avoid the depletions to surface water.

1. Transfers. One alternative includes obtaining a transfer of existing water rights to serve the new use; this could involve a transfer of surface to surface water, ground water to ground water, or surface to ground water.

A. Permanent transfer of existing water rights. This is an option for mitigation which currently exists under Idaho law. An existing ground water right can be transferred to a new well location and/or use. The annualized amount of water transferred from the existing water right is then considered mitigation for the new ground water right. The transfer to the new location and/or use must be completed prior to issuance of the license on the application in order to insure compliance with the mitigation requirement. In order to prevent expansion of the existing uses of the transferred water right,

the amount of the new permit depletion must be calculated and an equal amount of the existing depletion must be permanently retired.

Presently, Idaho law does not provide (nor preclude) for a surface water right to be "transferred" to a ground water right unless physical injection of the surface water into the underground aquifer, under stringent conditions, first occurs. This allows for the water to be quantified and physically "stored" underground for use later by the permit or license holder. However, if the annual flow from a surface water right has been measured and can be quantified, and it is allowed to flow unimpeded into Bear Lake, the Bear River or one of its tributaries between the Bear Lake Outlet Canal and the Idaho-Utah state line, some potential protestants have made informal agreements not to protest the application for the new ground water permit in return for discontinued use of the surface water right during the entire term of the permit and license for the ground water right as mitigation. The Committee recommends that IDWR accept and formalize this procedure. The surface water right can be quantified by its present duty. For example, if the surface water right is used for irrigation, then its volume in acre feet can be quantified by the acreage it irrigates. If the acreage ceases to be irrigated under the surface water right, then the amount of depletion attributable to the previous irrigation use becomes available for diversion from an underground well and transfer to a different use. (what about priority of right?)

The Committee further recommends that IDWR streamline and expedite transfers from surface water rights to ground water rights within the boundaries of the Bear River Basin Groundwater Management Area

B. Transfers of Irrigation Company Shares. Currently, Idaho Code §42-1765 requires the consent of the irrigation company or district if a transfer of water right is represented by shares. The committee recommends that more flexibility be created in the use of shares and allow for transfers of irrigation company shares to new uses pursuant to company - enacted policy.

Some domestic, commercial, municipal and industrial ("DCMI") are expanding onto previously irrigated land, and many subdivisions in unincorporated areas are being constructed on prior farmland. Most of this land has been served irrigation water under shares in an irrigation company. Yet, many irrigation companies in the Bear River Basin are hesitant to allow water previously delivered to shareholders to be diverted for DCMI uses, even on the same lands that were previously irrigated.

Often, they are fearful that the remaining shareholders will subsidize the DCMI use and suffer diminished flows in their system due to the transportation losses being spread among fewer shareholders.

The Committee recommends that IDWR develop a procedure to allow for transfers to be made on irrigation company shares and that an education effort be made with irrigation companies on the fringes of municipalities and in areas where subdivisions are being platted to enact policies allowing transfers to be based on shares of stock, on the condition that remaining irrigation shareholders do not suffer increased costs of delivery or take a lesser amount of water than they were delivered prior to the transfer. A draft policy for irrigation company consideration is attached as Appendix C.

2. Storage Facilities. An option strongly supported by the Committee is construction of new storage to allow Idaho's Bear River Compact allocations to be utilized, providing a source of mitigation water. New storage could be created above ground in the form of new reservoirs or underground by locating underground geologic formations that store surface water. These reservoirs (above ground and under ground) would be replenished by excess unallocated water.

3. Growing Municipalities and/or DCMI development should actively seek to purchase water rights from willing sellers. Municipalities and other new developments have an obligation to plan for their residents' future needs, for culinary supplies, fire protection and other needs. The Committee recommends that municipalities and other developments in the Bear River Basin begin actively acquiring water rights and shares in irrigation companies with service areas adjacent to or within their borders from willing sellers. Municipalities and new developments may elect to install secondary water systems for the outside watering of lots and gardens with the irrigation water, or they may elect to use the acquired water within their drinking water delivery systems by filing transfers. This is simply good planning on the part of Basin water users.

MITIGATION OPTIONS FOR APPLICATIONS FOR NEW PERMITS, OR FOR EXISTING APPLICATIONS

The Committee has identified some mitigation options for existing applications being held without action until the Director adopts a final Ground Water Management Plan and for new applications for

permit in the Basin. The list is not all-inclusive, and the suggestions are listed for illustration purposes. If an applicant develops a mitigation option not listed here, he or she should discuss it with the IDWR prior to applying for the new permit. The IDWR's interest is to provide certainty for the present using proven options, while encouraging creativity and flexibility to accommodate future technologies and innovations.

1. Encourage Use of Water Supply Bank. The Water Supply Bank is authorized by Idaho Code §42-1761-1766; it is operated and managed by the Idaho Water Resource Board on a state level. The purposes of the Water Supply Bank are to "encourage the highest beneficial use of water; provide a source of adequate water supplies to benefit new and supplemental water uses; and provide a source of funding for improving water user facilities and efficiencies. Water rights may be purchased, leased or gifted to the Water Supply Bank.

The Water Supply Bank could be used as a mechanism for mitigation in the Bear River Basin. Water rights could be deposited in the bank, with condition of non-use to provide mitigation for new ground water development. This mechanism would provide for protection against forfeiture of the water right due to non-use.

2. Surface Water Releases. Another option is for persons or entities holding existing surface water rights, under limited, specific circumstances, to release their surface water being diverted to Bear Lake or to the Bear River or its surface water tributaries between the Bear Lake Outlet Canal and the Idaho-Utah state line as mitigation for an unprotested permit for a new ground water point of diversion of equal depletion. The surface water right holder then would discontinue use of his surface water right for the entire time that the ground water permit or license was in existence. By obtaining water from such alternative sources, an applicant can avoid depleting surface water in the Basin, and thereby avoiding the mitigation requirements associated with new ground water uses. For certain water providers, conservation of water within existing permits and under licenses, or construction of new storage tanks also can decrease or avoid the need for a new ground water right.

3. Reactivate discussions on creating a Bear Lake Rental Pool. The Idaho Water Resource Board is authorized by Idaho Code §42-1765 to create a local rental pool and appoint a local committee to

administer it. A local rental pool would provide the benefits of being locally managed and controlled, allows for the development of procedures adapted for local conditions, and provides a source of funding.

Bear Lake is the obvious large storage reservoir to use as replacement water for Mitigation Plans. However, all usable storage is owned by PacifiCorp and completely allocated to members of the Bear River Water Users Association under their supplemental storage water contracts with PacifiCorp. Several years ago, the Bear River Water Users Association and PacifiCorp made a proposal to the IDWR and the Idaho Water Resource Board to create a mitigation rental pool using Bear Lake storage water. This idea had widespread support including various homeowner groups around Bear Lake. However, the proposal was not approved because Wyoming and Utah, the two other signatories to the Bear River Compact besides Idaho, as well as PacifiCorp, refused to approve a long term rental pool using Bear Lake unless some portion of the acreage previously irrigated with Bear Lake storage water was fallowed for the term of the new use from the rental pool to prevent enlargement of other water rights. The Idaho irrigation users of Bear Lake water also own decreed or licensed water rights, and they did not want to fallow land to rent their Bear Lake storage contract water to others.

The Committee believes that the rental pool concept is worth another look and should be considered as a readily available, practical and feasible water marketing mechanism and potential mitigation source.

4. Encourage short-term leases of water rights as a component of a larger Mitigation Plan. Many agricultural water right owners are willing to enroll in Conservation Reserve Programs, where they agree with the federal government not to farm their land. Those seeking water for a Mitigation Plan should consider contracting with the water right owner to use his or her water right during the term of the federal program. The contract would specify that the permittee could file a transfer on the water right for the new ground water use as part of the Mitigation Plan. A downside to this option is that the Conservation Reserve or other federal programs usually have a ten-year limit. If the mitigation is for a period longer than ten years, then a replacement water right would have to be acquired during the transfer period. This option should only be employed for temporary uses of water, or as the first part of a Mitigation Plan while the other identified parts are implemented.

5. Contract with agricultural users to enroll in the Conservation Reserve Program (CRP), or other similar programs. Then, transfer the water rights to new points of diversion and types and

places of use. Temporary transfers can be filed on water rights that are not being used at the present time as part of a Mitigation Plan. They may serve as a bridge between an immediate requirement to mitigate and a longer-term mitigation option that has already been identified in a Mitigation Plan, but cannot be implemented immediately.

Short-term leases or transfers of five years or less may not be used solely as a source of mitigation without a long-term source of mitigation being identified and ready to approve as a condition of the new permit. A contract is needed to provide certainty of a long-term mitigation measure before a short-term lease or transfer may be utilized. The terms of the contract should be incorporated into the permit as a part of the Mitigation Plan, and a copy of the contract, with pertinent financial information redacted, should be placed in the transfer file at the IDWR.

6. Compensation for depletion to existing water right holders. Monetary compensation to existing water right holders may be an acceptable form of mitigation.

OTHER RECOMMENDED ACTIONS

1. Encourage filing Statutory Claims where appropriate. Any person or entity claiming a water right established prior to May 20, 1971 for surface water or March 25, 1963 for ground water by diversion and application of the water to beneficial use is strongly encouraged file a statutory claim under Idaho Code 42-243 with the IDWR describing the use and making the claim a matter of public record. The committee strongly encourages municipalities that have been using water for a long time without a documented water right file a statutory claim.

2. Governmental entities should enact ordinances that would require developers to provide water for their new developments. All governmental entities should enact ordinances requiring developers to dedicate water rights approved for DCMI purposes at the governmental entity's approved point of diversion (such as a municipality's well) as a condition of development approval. An alternative would be for the ordinance to allow developers to pay money to the governmental entity to cover the costs of acquiring, on the open market from willing sellers, sufficient water rights that can be transferred into governmental entity's well. This option shifts the costs of developing new water sources to those who would use them through increased lot sales costs rather than having the entire governmental entity's

population pay for the new development. The committee recommends that local governmental entities provide preferential processing of subdivision applications to those developers using multiple domestic water systems.[2]

PROCESS FOR PENDING AND FUTURE GROUND WATER APPLICATIONS:

A number of ground water applications are currently pending before the IDWR. Paragraph 5 of the Director's Order establishing the Ground Water Management Area stated that all pending and future applications would be held without action until the final Management Plan was adopted.

The Committee recommends that within 60 days after adoption of the final Water Management Plan, the IDWR contact applicants whose applications are currently on "hold" to advise them of the requirement to develop a Mitigation Plan. The proposed mitigation plan would become an amendment to the application. The applications would be readvertised to give the Protestants an opportunity to review the proposed Mitigation Plan to see if they are satisfied that their prior existing water rights will not be injured by the new permit. Protests relating to the proposed Mitigation Plan may be filed in the same manner as protests for the water right application. The same time limits would apply.

Applicants may have up to 6 months to propose a Mitigation Plan or the Director will deny their application on the basis that it is not complete. Thereafter, new applicants will be encouraged to consult with local IDWR staff for assistance in understanding the mitigation requirements and options for their Mitigation Plans.

MONITORING, ENFORCEMENT, AND EVALUATION

All provisions of an approved Mitigation Plan shall be included as conditions on new ground water permits and licenses in the Bear River Basin. The conditions shall include provisions for monitoring

[2] Idaho law provides authority for governmental entities to charge impact fees to developers within their regulatory area under the "Idaho Development Impact Fee Act." Idaho Code § 67-8201, et.seq. Impact fees are "a payment of money imposed as a condition of development approval" to "[e]nsure that adequate public facilities are available to serve new growth and development." Id. at §§ 67-8203(9) and 67-8202(1). Public facilities include "[w]ater supply production, treatment, storage and distribution facilities." Id. at § 67-8203(24)(a). In addition, governmental entities may impose development requirements including, but not limited to, compelling "the payment, dedication or contribution of goods, services, land or money as a condition of approval." Id. at § 67-8203(10).

and reporting. Compliance with these conditions is required. Failure to comply shall constitute a violation of the permit conditions and shall be subject to enforcement actions, including curtailment of water use under the IDWR's conjunctive management rules. The permit and license holders shall be regulated by the appropriate water master.

CONCLUSION

The surface and ground water supplies in the Bear River Basin have been determined by the Director to be interconnected. When a new ground water use is initiated, it can deplete surface water flows, thereby decreasing availability of water for prior existing water right holders. Yet, future development in the Bear River Basin is likely to be dependent on ground water. Mitigation will be required to allow development to proceed while protecting the prior existing water right holders. This Report is intended to suggest some strategies to mitigate surface water depletion which can be incorporated into Mitigation Plans to avoid injury to prior existing water rights from new ground water development. The Committee appreciates the opportunity to participate in the planning process.

ISSUE 2: DOMESTIC WATER SYSTEMS

INTRODUCTION

The availability of high quality drinking water is of prime importance. Human health and maximizing the water resource can both be accomplished through these policies. While it is acknowledged that single family domestic wells can be drilled without the filing of a water right, it is recognized that these uses are a part of the water use picture in the Bear River Basin and need to be considered in the long range planning and water management strategies.

GOALS:

1. To ensure all new uses, excluding single family domestic uses, be included in depletion evaluations.
2. To encourage water conservation practices, through education, metering, fee structure modification or other methods.
3. To encourage cities and counties to undertake planning and study of long-term trends and needs which will provide the information necessary to identify future water requirements.

POLICY RECOMMENDATIONS

1. **It is the recommendation of this management report that community water systems be encouraged and single family systems be discouraged.** To minimize potential avenues of contamination by limiting the number of wells drilled, encourage one properly constructed community well instead of multiple single domestic use wells.

2. **It is the recommendation of this management report to encourage local planning and zoning agencies to require developers use existing irrigation water rights for all uses outside the home.** The committee encourages better use of water resources through use of available surface water for irrigation and other non-potable uses and to use treated or high quality water for potable purposes.

3. It is the recommendation of this report that IDWR provide clear guidelines for cities and counties to assist in planning necessary to meet their long-term water needs as described in Idaho Code §42-202b - 222.

ISSUE 3: MEASURING AND REPORTING OF WATER USE

INTRODUCTION

Reliable water diversion data are critical for making water management decisions. The acquisition of this data must be done is an equitable and coordinated way. Because ground and surface water are closely related in the Bear River Basin, both ground and surface water use information must be gathered.

GOALS

1. To have accurate accounting of existing and new water use in the Bear River Basin.
2. To develop an accurate water balance.
3. To ensure water use is within water right allocation.

POLICY RECOMMENDATIONS

It is the recommendation of this report that water uses from ground and surface water be measured and reported annually. IDWR should evaluate the future need for accounting for all water use, including small domestic and stockwater uses. Small domestic uses are thought to be one of the fastest growing uses in the basin and may need to be addressed. Measurement program should be in keeping with other IDWR measurement programs, both in structure and in content. Therefore, we suggest that the *IDWR Minimum Acceptable Standards for Measurement and Reporting of Surface and Ground Water Diversions (*dated 2/12/96*)* (Appendix D) be adopted as the standard.

RECOMMENDATIONS

1. That IDWR evaluate mitigation requirements imposed on new water use to ensure the mitigation strategies effectively protect existing water users and modify the management plan accordingly

2. That IDWR evaluate the adequacy of existing gauging and monitoring of ground and surface water and impose such requirements as may be needed to ensure accurate measurement and reporting.

ISSUE 4: AREA DESIGNATIONS

The committee did not determine a need for the designation of any areas of drilling concern **at this time.** The committee recommends that the department continue it's current effort for the designation in the City of Montpelier, as petitioned by the city.

However, the committee will continue to consider other designations that may be beneficial to the community and to the management of water resources. Therefore, **it is the recommendation of this report that the advisory committee, in coordination with Director, IDWR, evaluate governmental districts. These districts could provide potential funding mechanisms or other authorities for land and water development.**

ADDITIONAL ISSUES IDENTIFIED BY THE COMMITTEE

1. **It is the recommendation of this report that the boundaries of the Bear River Ground Water Management Area incorporate the land within Administrative Basin 13 that is tributary to the Bear River drainage.** The Director's Order specifically excluded the part of the Bancroft-Lund GWMA. However, it is felt by the committee that those lands that are tributary to the Bear River should be administered in common with other water rights in the Bear River drainage.

2. **It is the recommendation of this report that the water resources and citizens would benefit from the development of a Bear River Water Plan.** The committee, therefore, encourages the Idaho Water Resource Board to initiate the planning process for the Bear River Basin.

3. **It is the recommendation of this report that IDWR and the Idaho Water Resource Board investigate sites for potential storage and recharge sites.** The committee believes that the development of storage in the basin, both surface and subsurface, could provide multiple benefits and utilize water available in Idaho for new development under the Bear River Compact. The committee recommends funding sources be explored.

4. **It is the recommendation of this report that a Rental Pool be created to provide for an efficient management of water resources in the Bear River Basin.** The committee believes that the previous efforts to establish a Rental Pool should be revived.

5. **It is the recommendation of this report that water conservation practices be encouraged through information and education.** Water conservation can stretch existing water supplies and postpone or alleviate the need for new water development and mitigation. The committee believes that water conservation and efficient water use are important components of long-term water management in the Bear River Basin. Existing programs at federal, state and local levels should be promoted through public information programs and through educational efforts. Conservation concepts used with success in neighboring areas should be critically reviewed and implemented into local use plans.

6. **It is the recommendation of this report that IDWR develop an Information and Education program. This program should include workshops for local planning and zoning officials to**

address the interface of water rights, wells and resource protection with the local planning and zoning authorities and develop an understanding of where water laws end and planning and zoning laws begin.

Attachment A

BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

IN THE MATTER OF APPLICATIONS FOR PERMITS FOR DIVERSION AND USE OF SURFACE AND GROUND WATER WITHIN THE BEAR RIVER DRAINAGE AND GREAT BASIN TRIBUTARIES	**ORDER DESIGNATING THE BEAR RIVER GROUND WATER MANAGEMENT AREA**

A preliminary order was entered on January 11, 1999, designating a portion of the Bear River Basin in Idaho as a ground water management area, as provided in Idaho Code § 42-233b. On January 28, 1999, the City of Montpelier filed a petition seeking reconsideration of the order. Eldon B. Bingham, Evan Koller, PacifiCorp (d.b.a. Utah Power & Light Company), and Bear River Water Users Association, Inc., filed responses to the reconsideration request, and on June 2, 1999, the parties to this matter informally met with a representative of the Department of Water Resources at Montpelier, Idaho. Agreement was reached to enter a final order designating a ground water management area with certain changes to the preliminary order. This final order includes the agreed upon changes. Finding of Fact No. 13 has been added and Conclusion of Law No. 1 has been revised to acknowledge that Idaho law was changed in 2000 to provide for adoption of a management plan for a ground water management area. Finding of Fact No. 14 has also been added to acknowledge that the potential for continued drought conditions provides additional basis to make the designation at this time.

The Director of the Department of Water Resources ("Director"), having responsibility for administering the appropriation of water in the State of Idaho, the protection of rights to the use of water within the state, the protection of the public interest in the waters of the state, and the conservation of the water resources of the state, enters the following Findings of Fact, Conclusions of Law, and Order.

FINDINGS OF FACT

1. On May 14, 1997, PacifiCorp doing business in Idaho as Utah Power & Light Company ("Petitioner") filed a petition with the Idaho Department of Water Resources ("Department") seeking the following actions:

   a. Establishment of a moratorium on the issuance of, or further action on, permits or applications to appropriate ground water or surface water in the Bear River and Bear Lake Basin located within the State of Idaho;

   b. In the alternative, if the Director does not order a moratorium, establishment of a ground water management area in the Bear River and Bear Lake Basin located within the State of Idaho, and the adoption of a management plan, including establishment of a procedure whereby applicants demonstrate that use of water under their application will not adversely impact existing vested water rights or provide replacement water or mitigation

to compensate for impairment to existing vested water rights of Petitioner and its contract holders due to applicants' proposed uses;

c. Require accurate measurement and annual reporting of all surface and ground water uses in the Bear River and Bear Lake Basin located within the State of Idaho.

d. Order that all pending and future applications, and all applications or permits for which proof of beneficial use has not yet been made pursuant to the Department's rules, be subject to the moratorium or the ground water management area and management plan.

2. On May 14, 1997, the Bear River Water Users Association, Inc. (also referred to as "Petitioner") submitted a petition requesting the following actions of the Director:

a. Establish a moratorium in the Bear River Basin, as defined in the Bear River Compact, and suspend the issuance and further action on all permits or applications pursuant to Idaho Code § 42-1805(7) to the extent necessary to protect prior vested surface water rights in the Bear River Basin in Idaho, except to the extent that the applicant for a new diversion and/or depletion establishes by competent evidence that the proposed use will not impair existing water rights or provides compensation or replacement water in accordance with IDAPA 37.03.11;

b. Additionally, or in the alternative if a moratorium is not established, a ground water management area should be established pursuant to Idaho Code § 42-233b for the Bear River Basin, as defined in the Bear River Compact. In conjunction therewith, new applications for permits within the ground water management area should be approved by the Director only after he has determined on an individual case-by-case basis that sufficient water is available and that the holders of other prior vested water rights will not be injured by the proposed appropriation. As a part thereof, the Director should require that all water right holders within the ground water management area report withdrawals of ground water and provide other necessary information for the purpose of assisting him in determining available ground water supplies and regulating usage, together with depletions and other impacts upon surface water rights;

c. That the Department prepare and implement a plan to monitor and evaluate ground water diversions and depletions in the Bear River Basin;

d. That all future applications to appropriate water within the Bear River Basin be subject to the foregoing;

e. That action on all pending applications to appropriate water within the Bear River Basin be stayed until this petition has been acted upon.

3. Notice of the petitions was given and meetings were held in Preston and Soda Springs, Idaho on July 2, 1997, to disseminate information about the petitions and obtain public comments on the proposed actions. Written comments were accepted until August 1, 1997.

4. The comments received at the public meetings and in writing opposed the imposition of a moratorium on water right development but recognized the need to protect prior rights to the use

of water in the Bear River Basin. Most of those commenting supported the establishment of a ground water management area provided the ensuing management plan would allow the development and use of Idaho's share of unappropriated water in the Bear River Basin under the Bear River Compact, with requirements adequate to protect prior water rights.

5. A study in the Bear River Basin by Dion (1969) shows that the ground water and surface water in the Bear River Basin are directly interconnected, generally. The geology of the valley floor has been characterized as being mostly "unconsolidated basin-fill deposits of Quaternary age . . . and younger alluvium." Diversion and use of water from a tributary stream or well will impact the total water supply available in the system.

6. A study done by the U. S. Geological Survey, published in 1994 by the Utah Department of Natural Resources (Technical Bulletin No. 108), found that withdrawal and use of ground water from the Cache Valley caused a reduction in the flow of Bear River.

7. As of August 10, 2001, thirty-five (35) applications for permit to appropriate water are pending in the Department's Administrative Basins 11 and 13. Of these, six (6) applications for permit proposing irrigation or other consumptive uses are pending in Administrative Basin 11 and nine (9) applications for permit for such purposes are pending in Basin 13. Most of these applications have been protested by the Petitioners and other holders of senior priority water rights alleging injury due to the reduction in the amount of water available to the Protestants' senior priority rights.

8. On February 1, 1982, the Department issued an administrative directive that applications for permit, which propose diversion of surface water from the Bear River and tributaries between April 15 and October 15 for new consumptive uses, would not be approved. The order applies to Administrative Basins 11 and 13.

9. On October 21, 1991, the Department designated the Bancroft-Lund Ground Water Management Area, which includes part of the northern portion of Administrative Basin 13 and a part of Administrative Basin 29 (the Portneuf River Basin).

10. There is surplus and unappropriated surface water and ground water in the Bear River Basin in Idaho. However, at times during nearly every year, the flow of the Bear River is not adequate to satisfy all existing water rights from the river. Because surface flows are generally fully appropriated during the peak irrigation demand periods, and additional depletion caused by ground water withdrawals will further reduce flows to the river and various springs, it is anticipated that new appropriations from ground water will need to provide replacement water or other mitigation to prevent or compensate for injury to existing rights from hydraulically connected surface water sources.

11. The Bear River Compact, as Amended in 1980, apportioned the first 125,000 acre feet of additional future depletion of water from the Bear River, including ground water tributary to the Bear River, for use in Idaho. However, new development using the compact apportionment cannot injure prior water rights in Idaho or rights with a priority earlier than January 1, 1976, in the State of Utah.

12. The Petitioners verbally described that the area of the Bear River Basin to which the petitions were intended to apply corresponds to the Department's Administrative Basins 11 and 13.

13. Effective July 1, 2000, Idaho Code § 42-233b was amended to authorize the adoption of a ground water management plan for designated ground water management areas.

14. Southern Idaho, including Administrative Basins 11 and 13, is experiencing the second consecutive year of moderate to severe drought conditions. Designation of a ground water management area at this time will allow additional management authorities provided in Idaho law to address water shortages, should the drought conditions continue.

CONCLUSIONS OF LAW

1. Idaho Code § 42-233b provides in pertinent part as follows:

> "Ground water management area" is defined as any ground water basin or designated part thereof which the director of the department of water resources has determined may be approaching the conditions of a critical ground water area . . .
>
> When a ground water management area is designated by the director of the department of water resources, or at any time thereafter during the existence of the designation, the director may approve a ground water management plan for the area. The ground water management plan shall provide for managing the effects of ground water withdrawals on the aquifer from which the withdrawals are made and on any other hydraulically connected sources of water
>
> Applications for permits made within a ground water management area shall be approved by the director only after he has determined on an individual basis that sufficient water is available and that other prior water rights will not be injured.

2. Idaho Code § 42-233a provides in pertinent part as follows:

> "Critical ground water area" is defined as any ground water basin, or designated part thereof, not having sufficient ground water to provide a reasonably safe supply for irrigation of cultivated lands, or other uses in the basin at the then current rates of withdrawal, or rates of withdrawal projected by consideration of valid and outstanding applications and permits, as may be determined and designated, from time to time, by the director of the department of water resources.

3. Idaho Code §§ 42-201 and 42-229 require a permit to appropriate water from surface and ground water sources in Idaho. Idaho Code § 42-227 exempts domestic purposes from the permit requirement. Idaho Code § 42-111 defines domestic purposes as follows:

   a. The use of water for homes, organization camps, public campgrounds, livestock, and for any other purpose in connection therewith, including irrigation of up to one-half (½) acre of land, if the total use is not in excess of thirteen thousand (13,000) gallons per day, or

b. Any other uses, if the total use does not exceed a diversion rate of four one-hundredths (0.04) cubic feet per second and a diversion volume of twenty-five hundred (2,500) gallons per day.

4. Diversion and use of ground water for new consumptive purposes in the Bear River Basin generally reduces the amount of surface water available to supply prior water rights.

5. In connection with the supervision and control of the exercise of ground water rights, the Director has the authority, pursuant to Idaho Code § 42-237a(g), to determine the areas of the state having a common ground water supply and if it is determined that the flow of a stream is affected by withdrawal of ground water to administer the ground water and surface water conjunctively.

6. Policy 1F of the State Water Plan dated January 1997, as adopted by the Idaho Water Resource Board and ratified by the Idaho Legislature, provides that:

> It is the policy of Idaho that where evidence of hydrologic connection exists between ground and surface water, that they be managed as a single resource.

7. The Director is authorized to order the installation and maintenance of measuring devices and to require measurement and reporting of water withdrawals in accordance with Chapter 7, Title 42, Idaho Code.

8. The request to establish a moratorium on the issuance of permits to appropriate water in the Bear River Basin should be denied, because a long-term or permanent moratorium would delay or pre-empt development authorized by the Bear River Compact. The request to stop further development under existing permits should likewise be denied.

9. The Director should designate a ground water management area and should make provision for a management plan to be developed using an advisory committee with representation from water user and citizen group interests within the Department's Administrative Basins 11 and 13. The management plan should incorporate requirements for measuring and reporting of water withdrawals, as determined necessary by the Director with the advice of the advisory committee.

10. The Bear River Ground Water Management Area should exclude the part of the Bancroft-Lund Ground Water Management Area that is within Administrative Basin 13.

ORDER

IT IS, THEREFORE HEREBY ORDERED as follows:

1. The Petitioners' request to establish a moratorium on the issuance or further action on permits to appropriate water in the Bear River Basin is DENIED.

2. The Petitioners' request for designation of a ground water management area in the Bear River Basin is APPROVED. The area included in the "Bear River Ground Water Management Area" is that part of the Bear River Basin included within the Department's Administrative Basins 11 and 13, excluding therefrom the area encompassed by the Bancroft-Lund Ground Water

Management Area. Attached to this Order is a map identified as Attachment A, that graphically shows the boundaries of the Bear River Ground Water Management Area.

3. Management of water appropriations within the Bear River Ground Water Management Area shall be guided by a management plan adopted by the Director. An advisory committee of representative water user and citizen group interests within the Department's Administrative Basins 11 and 13 will be selected to assist in drafting the management plan. The unadvisory committee and the Department will consider the following matters in preparation of a management plan:

   a. The requirements and conditions needed to protect existing water rights as applications for new consumptive uses from ground water are approved;

   b. The need for policies to encourage development and use of water supply systems to provide water for multiple ownership subdivisions rather than individual wells for each residence or business;

   c. Appropriate requirements for measuring and reporting of water withdrawals by new and existing uses from surface and ground water sources;

   d. The need to designate areas of drilling concern to protect ground water quantity and quality.

4. The Bear River Water Management Advisory Committee is hereby created with the following membership and responsibilities:

   a. Committee membership: one (1) member from each of the Petitioners, two (2) members from the pending applicants for permits to appropriate ground water, one (1) member representing each of the counties included within the Bear River Ground Water Management Area (Bear Lake, Caribou, and Franklin), two (2) members representing municipalities, and two (2) members representing citizen groups within the Bear River Ground Water Management Area. The Department will ask for nominations from the various entities as the committee is formed. The Director or his designee will chair the advisory committee meetings;

   b. Responsibilities: the advisory committee will meet at the call of the Director at a location in the Bear River Ground Water Management Area to provide guidance in the preparation of a management plan. The entities represented by the members are responsible for the costs and expenses incurred by the members in attending the meetings and otherwise serving on the committee.

5. All applications proposing new consumptive uses of ground water, whether now pending or filed in the future, are to be held without action to approve or deny until a management plan is adopted as herein provided.

6. This order does not affect the authorization to continue development of any existing approved application (permit).

7. This order does not apply to any application proposing a non-consumptive use of water as the term is used in Idaho Code § 42-605A.

8. This order does not apply to applications for drilling permits to replace or deepen existing wells having valid existing water rights or to applications for transfer of existing water rights.

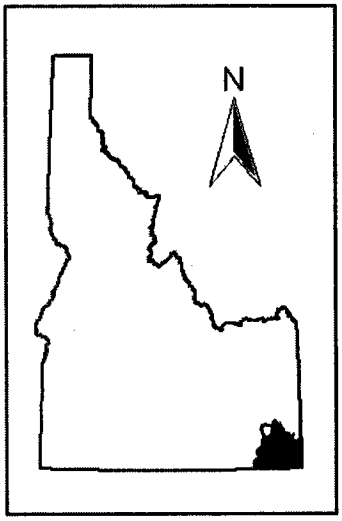
9. This order does not change or affect the administration of any area within the Bear River Basin that as been previously designated as a ground water management area pursuant to Idaho Code § 42-233b, Idaho Code.

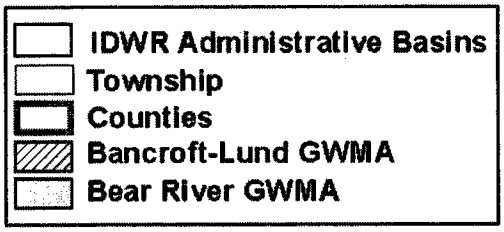
DATED this 12th day of August, 2001.

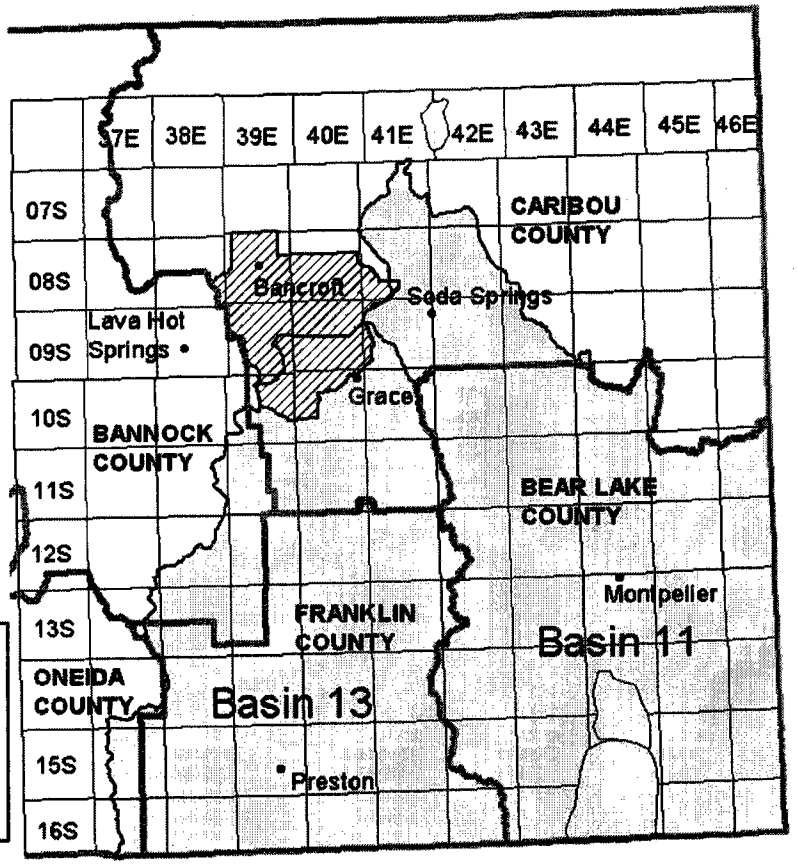
/s/ Karl J. Dreher
KARL J. DREHER
Director

Bear River Ground Water Management Area

Attachment A







Appendix B

BEAR RIVER WATER MANAGEMENT ADVISORY COMMITTEE

PacifiCorp: **Claudia Conder**
Alternate: **Kelly Holt**

Bear River Water Users Association: **Marc Gibbs**
Alternate: **Dean Mathews**

2 members representing pending applicants for permits to appropriate ground water

Lee Godfrey, Soda Springs
Jeff Johnson, Farmer

Bear Lake County: **Conrad Michaelson**

Caribou County: **Norm Johnson**

Franklin County: **Miles Geddes**

2 members representing municipalities

Roy Bunderson, City of Bloomington
Ray Welker, City of Grace

2 members representing citizen groups

Jim Kimbal, Bear Lake Preservation Comm.
Olean Parker, Love Bear Lake

Appendix C

DRAFT TRANSFER POLICY FOR IRRIGATION COMPANIES

No transfer application shall be approved by the board of directors of the company unless the following requirements are satisfied:

1. The title to all water rights will remain the name of the company and all transfer applications must be made jointly in the name of the company and the stockholder.

2. The request for a filing of a transfer application must be submitted to the company in writing. The request must include the transfer in point of diversion, place of use, and nature of use, quantity of water to be transferred, stock certificates evidencing the water that is to be transferred, and any other information the company may reasonably require to evaluate the request.

3. The transfer application must reflect the water available per share of stock as set forth in the articles of incorporation or based upon the historical delivery records of the company.

4. The transfer application must reflect reasonable deductions from the above amount to protect the remaining stockholders from injury related to the transfer application. All factors which would in any way injure existing stockholders shall be reflected, including, but not limited to, the loss of transport or carrier water, reductions in return flows to other stockholders, increased inefficiencies in the operation of the company's water system or an increased consumptive use of water.

5. The company shall consider any factors used in evaluating and approving transfer applications by the Idaho Department of Water Resources and any other factors that the board of directors determines to be important to the company, including but not limited to the following:

(a) any increased costs to the company or its stockholders that are attributable to the proposed transfer application;

(b) any interference with the company's ability to manage and distribute water to all of the company's stockholders;

(c) whether the proposed transfer application is filed for more of the company's water right or water rights, than the stockholder is allowed to use based upon the stockholder's ownership of stock in the company;

(d) whether the proposed transfer application will impair the quantity or quality of water delivered to other stockholders;

(e) whether the proposed transfer application will violate a statute, regulation, ordinance or an order issued by a governmental agency or court of proper jurisdiction;

(f) whether the stockholder can arrange for the removal of land from irrigation under the proposed transfer application; and

(g) any cumulative effects associated with the proposed transfer application.

6. If irrigation is involved in a transfer application, the stockholder shall identify any land to be retired from irrigation and any land to be placed into irrigation. The land retired from irrigation must be within the service area of the company and either belong to the stockholder requesting the transfer application or another stockholder who agrees to retire the land from irrigation pursuant to an agreement that is acceptable to the company. If water is being removed from any other use, the transfer application shall identify the decrease in quantity of water for the other use and identify how such a reduction is being accomplished.

7. All assessments on the shares of stock representing the water being used to file the transfer application shall be paid at the time the board of directors is requested to approve the transfer application. All assessments on the shares of stock subject to the transfer application shall continue to be paid after filing, approval and license of the transfer application.

(a) If an assessment is not paid in a timely fashion, the company may withdraw its transfer application or immediately file another transfer application returning the company and its water rights to the position they were in prior to the filing of the transfer application. This

right is in addition to any other rights the company may have to enforce payment of its assessments.

(b) The transfer of any shares of stock to another person, firm, company, governmental entity, or other transferee, prior to or after the filing of a transfer application shall be conditioned upon the guarantee of the continued payment of assessments by the transferee. The guarantee shall be made in a form that is acceptable to the board of directors of the company.

8. The stockholder requesting the transfer shall have the responsibility of preparing the proof on the transfer application. The stockholder must prepare the proof and deliver it to the company at least 60 days before the proof is due. The company will file the proof with the Idaho Department of Water Resources. Any extension of time in which to file proof must be approved in writing by the company and filed by the company.

9. The stockholder must place a meter or other measuring device at the new point of diversion or diversions of the water that is transferred and record water use. An annual report of water use must be filed with the company at the same time that the stockholder's annual assessments are due and payable to the company.

10. No transfer application will be approved that will cause the company's delivery system to its other stockholders to be subject to state or federal drinking water standards.

11. The stockholder requesting the transfer application shall pay all company costs of administering the transfer application and all other costs that associated with the transfer application. The stockholder must pay the company $_____ as a nonrefundable processing fee and an additional $_____ as an advance to pay the company's costs. If the amount paid to the company as an advance of costs is less than the costs and expenses incurred by the company, the stockholder must reimburse the company for the amount of the deficiency within 10 days of approval of the transfer application. If the amount paid to the company exceeds the costs and expenses, the company will reimburse the stockholder for the difference.

12. The stockholder requesting the transfer application will execute an agreement with the company incorporating the above provisions and any other conditions required by the company before the transfer application will be submitted to the Idaho Department of Water Resources for approval.

13. The company may approve the request for filing of a transfer application, approve the request with conditions, or deny the request with a letter stating the reasons therefor.

14. The company will decide on a stockholder's request for the filing of a transfer application within 120 days and notify the stockholder in writing of its decision.

Attachment D

STATE OF IDAHO

DEPARTMENT OF WATER RESOURCES (IDWR)

MINIMUM ACCEPTABLE STANDARDS FOR MEASUREMENT AND REPORTING OF SURFACE AND GROUND WATER DIVERSIONS

The source and means of diversion of water, whether surface or ground water, generally determines the measurement and reporting process. Surface water sources such as streams, springs and waste channels are normally diverted into open channels (ditches or canals), but closed conduits (pipes or culverts) are also used. Ground water is usually diverted into pipes (which may also discharge into open channels).

Measuring devices are required at or near the point of diversion from the public water source.

SURFACE WATER DIVERSIONS

I. Flow Measurement

The following discussion is applicable only to diversions from surface water sources. Measurement of a ground water diversion with an open channel measuring device must be preapproved by the Department.

A. Standard Open Channel Measuring Devices

All open channel flow diversions should be measured using one of the following standard open channel flow measuring devices commonly used in Idaho:contracted rectangular weir

- suppressed rectangular weir
- Cipolletti weir
- 90 degree V-notch weir
- Parshall flume
- trapezoidal flume
- submerged rectangular orifice
- constant head orificeramped broad crested weir (or ramped flume)

Construction and installation of these devices should follow published guidelines. References are available upon request.

B. Non-standard open channel devices: Rated Structures or Rated Sections

IDWR may authorize the use of non-standard devices and rated sections provided the device or section is rated or calibrated against a set of flow measurements using an acceptable open channel current meter or a standard portable measuring device. Further restrictions and requirements are available from the Department upon request.

C. Closed conduit measuring devices

Refer to the Ground Water measuring section for installation, accuracy, and calibration standards of closed conduit measuring devices.

II. Reporting

All surface water measuring devices, rated structures and rated sections should be read and readings recorded at least once per week, and more frequently if necessary. IDWR will accept the assumption of

constant flow rates between readings if flow rates are continuous and reasonable constant. Forms will be provided for recording dates, stage (or water levels) and flow rates.

Users with diversions located within water districts may report their diversions individually to IDWR or provide for the water district watermaster to report their diversions in acceptable annual water distribution reports. Ground water diversions are not normally included in a water district, and must be reported individually.

GROUND WATER DIVERSIONS

Ground water diverters have the option of installing a flowmeter, or using power records to estimate water withdrawals. Information regarding the use of power records will follow this discussion of flowmeters.

I. Flow Measurement

There are many flowmeters on the market, with costs ranging from several hundred dollars to several thousand dollars. In general, the higher priced meters are more accurate and require less maintenance. Most meters on the market have an acceptable accuracy rating for IDWR's guidelines. However, some types and designs are much more prone to maintenance problems. Moving parts tend to wear when sand or silt is present, and moss often plugs small orifices and slows moving parts. No single flowmeter is best for every situation. We recommend that you visit with qualified dealers and discuss your needs with them.

A. Minimum Standards

The following are minimum standards for closed conduit flowmeters:

- Minimum manufacturers' design accuracy of +/- 2 percent of reading
- Installed accuracy of at least +/- 10 percent of reading
- Meter must be calibrated with an independent, secondary measuring device when installed, and at least once every four years thereafter
- Must read instantaneous flow or be capable of flow rate calculation
- Must record total volume
- Non-volatile memory (power outage does not zero volume reading)
- Sufficient digits to assure "roll-over" to zero does not occur within 2 years
- Volume reading cannot be "reset" to zero
- Installed to manufacturers' specifications

Meter manufacturers typically specify that a meter must be located in a section of straight pipe at least 10 pipe diameters downstream and 5 pipe diameters upstream of any valves, bends, contractions, or other interferences which will distort the flow pattern. However, some types of meters will produce acceptable results when installed in shorter sections of straight pipe. For example, at least one electro-magnetic flowmeter provides excellent measurement accuracy with only 5 lengths of straight pipe upstream from the meter.

Each manufacturer should provide the installation specifications for its meters. These **specifications must be adhered to** in order to achieve the accuracy required for the water measurement program. Again, we stress the importance of visiting with a qualified dealer and discussing your specific needs with them.

B. Types of Measuring Devices

Types	Pipe Sizes	Maintenance Required	Relative Purchase Price
Differential Head • Orifice • Venturi • Annubar	small to large	Low to high. Sand wears on sharp edges, and particles can plug small orifices and tubes.	low to medium
Force Velocity • Turbine • Propeller • Impeller	small to large	Typically moderate to high. Often problematic when exposed to sand or moss. Some cannot measure low velocities	low to medium
Ultrasonic	small to large	Low. Typically non-invasive with no moving parts to wear	high
Vortex	small to medium (about 12 to 14 inch maximum pipe diameter	Low. Few or no moving parts to wear.	high
Electro-Magnetic	small to medium (about 12 to 14 inch maximum pipe diameter	Low. No moving parts. Can provide good results with shorter lengths of straight pipe.	high

II. Power Records

An alternative to installing flowmeters is the use of power records and other information to estimate the annual diversion from a pump. This method, which we call the Power Consumption Coefficient (PCC) method, utilizes information obtained from the pumping plant while running at or near full capacity. Two parameters are measured while the pump is operating: flow rate and input power. With this information, one can calculate the number of kilowatt-hours required to pump one acre foot of water. This number is unique to each well and pumping plant due to the physical attributes of the system.

To determine the rate of flow, a portable measuring device, such as an ultrasonic non-invasive meter or a differential head device, can be used. Simultaneous with the flow measurement, power is measured using the utility's kilowatt-hour meter. A qualified individual with the necessary equipment will be required to perform these measurements. If your system is operating when the Department examines it after proof of beneficial use is filed, the Department will derive this relationship. Otherwise, you may have to hire a private consultant to make the measurements in subsequent years.

With the power consumption coefficient, an annual volume of water pumped can be calculated from the total annual kilowatt-hours of energy consumed by the pumping plant. The total power usage for each pumping plant will be supplied to the Department by electric utilities.

Some complex systems cannot use this method due to the potential for large errors. See the discussion on page 5 to see if this method can be used.

Because systems wear and water levels change, it is necessary to occasionally verify the flow to power ratio. Therefore, the power consumption coefficient must be re-calibrated at least once every four years.

III. Water Level Measurements

All ground water pumpers will be required to make certain water level measurements. These measurements will be used by the Department and other groups to study and define aquifer characteristics. They include:

- measure and record the depth to water in the well (pump off) prior to the first diversion of the irrigation season
- measure and record the depth to water in the well with the pump operating and the system stabilized. This measurement should be made early in the season, preferably within days of turning on for the first time.

IV. Reporting

For irrigation, all ground water measuring devices should be read and readings recorded prior to the first diversion of the season (around April 1), at least once per month during the irrigation season, and at the end of the irrigation season. Non-irrigation users should begin measuring within 56 days of receiving measurement information.

When power records are used to estimate the diversion, it may be necessary to keep a daily record of pump operation. This will usually only be necessary when the pump's flow rate changes significantly due to operational or other changes. For example, operation of multiple pivots, using fewer lines, booster pumps, throttling, etc. will usually cause dramatic changes in the flow.

All records of measurements and readings shall be submitted to the Department after the last diversion of the irrigation season, and no later than January 15th of the following year.

Can power records be used to estimate my diversion?

Only irrigation water users may use power records to estimate their diversion because the utilities will only provide consumption information for irrigation uses. If you are not an irrigation user, but want to use power records, you must propose a method of reporting your power consumption data.

Owners of **surface water diversions** must have a flow measuring device in most cases. The alternate method of estimating water withdrawals with power records cannot be used unless you pump from a public water source and can show the Department that it will yield reliable results (case by case determination).

Owners of **ground water diversions** can either install a totalizing flowmeter or ask the Department to use power records to estimate withdrawals. If the pump discharges to an open channel, an open channel measuring device can be employed to measure the water diverted if the device and a method of tracking

hours of operation are pre-approved by the Department. Flow meters which register only instantaneous flow rate are not acceptable unless the water user can demonstrate a reliable method of tracking the number of hours the pump operates through the season (the flow measuring device must then be read and flow rate recorded at least once per week).

Estimating total water diversion from power records requires the derivation of a relationship between power demand and flow. Flow rate and power demand must be measured simultaneously to determine the number of kilowatt hours needed to pump an acre foot of water. This relationship, called a power consumption coefficient, is applied to the year end power records to determine the total acre feet diverted.

The total water diverted can be accurately estimated if the system configuration or operation is not complex. Unfortunately, power records will not always yield acceptable results, and it will be necessary to install a flowmeter. **Flowmeters must be installed** if any of the following conditions exist:

- The well flows (artesian) so that water can be diverted when the pump is off.
- The energy consumption meter that records power used by the pump also records power used by other devices not integral to the irrigation system. For example, if the meter also records power used by a home, shop, cellar, etc., a flowmeter must be installed because power used by the pump cannot be isolated from the other devices. However, if the meter also records power used by center pivots, booster pumps, or other devices which operate when the main pump operates, the alternate method may be acceptable.
- The energy consumption meter records the power used by more than one well pump. If a deep well pump which discharges to an open pond or ditch and a relift pump are both connected to the same electrical meter, the discharge from the well pump can be measured, and a time clock can be installed to record the total number of hours of pump operation which can be multiplied by the flow rate to determine the total volume of water diverted.
- The energy supplied to the pump cannot be accurately and reliably measured. For example, most diesel and propane driven pumps do not have provisions to measure the fuel used by the engine. These will be reviewed one case-by-case basis.
- The flow rate from the pump varies significantly due to changes in demand or operation. For example, pumps that discharge into a pressurized system some times and then open discharge at other times, or pumps that supply multiple pivots, would likely have flow rates that changed drastically. These changes would alter the flow to power ratio, causing inaccurate estimates of diversions. The alternate method of estimating water withdrawals with power records may only be used if the water user can propose an acceptable method of tracking these changes in operation.
- Changing water levels cause the flow to vary more than 25% (or pressures to vary more than 15%) over the irrigation season.

Should I use a flowmeter or power records?

If, after determining that you may use the alternate method of estimating your annual diversion with power records, but you are not sure which method would be best for you, the following may help you decideIf you choose to **INSTALL or use an existing FLOWMETER,** you will need to:

- Install a flow meter prior to the first diversion of the irrigation season. Estimated cost for a new meter is from $800 to $5,000 or more, depending on the size and type of meter, the complexity of the piping system, and the availability of straight, exposed pipe.
- All flowmeters must be calibrated before use, and at least once every four years thereafter. This may be a service provided by private consultants, utilities, irrigation districts, or other entities which can verify the accuracy of your flowmeter.
- Record the total flow reading indicated on the flowmeter several times throughout the season. Estimated time involved is about 1 to 3 hours per diversion per year.

If you choose to **USE POWER RECORDS** to estimate your diversion, you will need to:

- Submit maps and a schematic drawing of the wellhead and associated piping to the Department, which will be evaluated to determine whether power records can be used. If acceptable, you must sign an agreement with the Department.
- Have an approved consultant establish the relationship between flow and power for each diversion at least once every four years. The Department will do this work at the time your use is examined for proof of beneficial use if your system is running.
- Record the utility meter identification number (the identification number on the face of the utility's meter which records the quantity of energy supplied to the pump) prior to and after diverting for the season (around April 1 and November 1). This is necessary because utilities regularly change meters, and this change may affect the power to flow ratio.
- Keep a daily record of pump operation. This will usually only be necessary when the pump's flow rate changes significantly due to operational or other changes. The amount of time necessary to keep these records will be proportional to the number of changes made to the system.
- Measure and record the pressure in the piping system, near the pump's discharge once a month during the irrigation season

Appendix E

List of Pending Applications in Basins 11 and 13 (as of June 6, 2002)

Number		Priority Date	Owner List	Source List	Div. Rate	Water Use List
11	7216	12/12/1980		BEAR RIVER	1500	POWER
11	7338	02/06/1984	UTAH PROCESS AGENCY INC (Current)	UNNAMED STREAM	0.32	DOMESTIC, IRRIGATION, STOCKWATER
11	7356	02/20/1986	CITY OF SODA SPRINGS (Current)	FORMATION SPRING	5	MUNICIPAL
11	7395	04/16/1991	EVANS, ZELDA C (Current)	GROUND WATER	3.6	IRRIGATION
11	7401	08/10/1992		UNNAMED STREAM	0.11	IRRIGATION, STOCKWATER FROM STORAGE, STOCKWATER STORAGE
11	7403	04/12/1993	HUMBLE, DELVIN (Current); HUMBLE, TONI (Current)	GROUND WATER	0.14	IRRIGATION
11	7427	07/05/1995	WORLD TRAVEL ASSN (Current)	SPRING	0.04	DOMESTIC, STOCKWATER
11	7432	04/08/1996	LIBERTY CEMETARY DISTRICT (Current)	GROUND WATER	0.09	IRRIGATION
11	7439	03/18/1997	BENNINGTON WATER SYSTEMS INC (Current)	GROUND WATER	0.66	DOMESTIC
11	7440	04/24/1997	BISSEGGER, GORDON N (Current)	GROUND WATER	2	IRRIGATION, STOCKWATER
11	7445	07/20/1998	BEAR LAKE EQUESTRIAN ESTATES (Current)	GROUND WATER	0.87	DOMESTIC, STOCKWATER
11	7447	06/07/1999	INDIAN CREEK RANCH LLC (Current)	SPRING	0.05	DOMESTIC
11	7448	06/07/1999	FOUR PINES LLC (Current)	UNNAMED STREAM		RECREATION STORAGE
11	7450	11/01/1999	MORRIS, JEFFREY (Current)	SKINNER CREEK	0.2	AESTHETIC
11	7481	11/08/2001	SAMS HOLLOW WATER COMP (Current)	GROUND WATER	1.35	COMMERCIAL, DOMESTIC
11	7483	02/20/2002	BEAR LAKE HOLDINGS (Current)	GROUND WATER	0.34	DOMESTIC
11	7491	01/11/2002	SAMS HOLLOW WATER COMP (Current)	GROUND WATER	1.22	DOMESTIC
13	7289	06/03/1980	JORGENSEN, BILL E (Current)	GROUND WATER	2.3	IRRIGATION
13	7463	03/03/1989	R LLOYD BROS (Current)	GROUND WATER	2.6	IRRIGATION
13	7500	08/24/1992	JOHNSON, KENT B (Current); JOHNSON, RALPH B (Current); JOHNSON, STEVEN A (Current)	GROUND WATER	2.4	IRRIGATION
13	7505	01/14/1993	MERRILL, GLEN (Current)	STOCKTON CREEK	0.5	DIVERSION TO STORAGE, IRRIGATION FROM STORAGE, IRRIGATION STORAGE
13	7509	06/21/1993	WALLINGFORD DEVELOPMENT INC (Current)	GROUND WATER	4.08	IRRIGATION
13	7511	08/06/1993	FAIRVIEW WATER DIST (Current)	GROUND WATER	4	STOCKWATER
13	7533	08/04/1995	KOLLER, EVAN O (Current)	UNNAMED DRAIN	0.06	DOMESTIC, IRRIGATION, RECREATION, STOCKWATER
13	7534	08/09/1995	PETERSON, PETE (Current)	WASTE WATER	0.8	IRRIGATION
13	7537	12/04/1995	ELGAN, JESS B (Current)	FIVEMILE CREEK	0.02	STOCKWATER
13	7541	04/04/1996	REEDER, GEORGE (Current); REEDER, NARETTA T (Current)	SPRING	0.03	STOCKWATER
13	7545	10/30/1996	RITEWOOD INC (Current)	GROUND WATER	0.04	STOCKWATER
13	7546	12/23/1996	GRASS VALLEY ENTERPRISE (Current)	GROUND WATER	1.5	IRRIGATION
13	7549	04/11/1997	SLADE, LYNNE M (Current); SLADE, PAUL C (Current)	SPRING	0.16	DOMESTIC, STOCKWATER
13	7550	04/24/1997	KOLLER, CARL R (Current)	GROUND WATER	0.33	DOMESTIC
13	7551	05/28/1997	ROLAND HULL FAMILY TRUST (Current)	SPRING	0.14	DOMESTIC, STOCKWATER
13	7552	06/09/1997	CHECKETTS, LLOYD S (Current)	GROUND WATER	5.6	IRRIGATION
13	7557	07/24/1998	COLBY, GARY G (Current)	SPRING	0.04	DOMESTIC
13	7584	09/29/2000	CHRISTENSEN, DENA (Current)	GROUND WATER	0.16	DOMESTIC
13	7598	05/01/2001	FOX, LAWRENCE (Current); HORSLEY, ALLAN (Current)	SPRING	0.1	DOMESTIC
13	7599	07/19/2001	CHECKETTS, BRICE (Current)	UNNAMED STREAM	0.2	STOCKWATER
13	7601	03/12/2002	CLEGG, KENT (Current)	UNNAMED STREAM	0.5	FISH PROPAGATION
13	7607	03/13/2002	TOPAZ MARKETING L P (Current)	SPRING	0.02	STOCKWATER

Appendix F

Mitigation Strategies for Bear River Basin