PROPOSED AMENDMENTS

TO THE

WATER QUALITY SECTION

OF THE

COORDINATED WATER RESOURCE MANAGEMENT PLAN

LAST REVISED IN 2011

The Middle Snake River Study Group (1989-1991) was a joint effort among the counties of Gooding, Jerome, Lincoln and Twin Falls to address water quality problems with all surface water in the Middle Snake River Region. The planning document now known as the Coordinated Water Resource Management Plan has been adopted by Gooding, Jerome, Lincoln, Twin Falls and Cassia counties. The plan also authorized the establishment of the Middle Snake Regional Water Resource Commission. The Commission's duties and responsibilities are set forth in the authorization section of this document. The plan was expanded to include a section on the history of the region and a section on water quantity in 1995. The economic portion of the plan was added in 1996. Ground water quality was incorporated into the plan in 2002. All sections ~~to~~ of the plan are reviewed and updated on a regular basis.

Ground water issues were addressed by the Middle Snake Regional Water Resource Commission in 1995 when groundwater problems first became apparent in Gooding and Lincoln counties and continue throughout the region to this day. Between 1995 and 2001 additional ground water quality data was collected by the USGS to facilitate the incorporation of ground water quality into the Coordinated Water Resource Management Plan.

The Idaho Department of Environmental Quality (IDEQ) currently recognizes three areas in our five county region as nitrate priority areas within the state. Ranking of priority areas are updated every five years by IDEQ and were last updated in 2014. A map of each priority area can be found under the IDEQ web site by searching on nitrate priority area. The Marsh Creek area in Cassia County is currently ranked as the highest priority in the state. Others are a large area in Twin Falls County (ranked 21) and near Bliss in Gooding County (ranked 32). Ground water in these areas typically are slow moving, have high water tables and/or are located under fractured basalt. This makes them highly susceptible to contamination through leaching of nitrates as well as other biological, chemical and physical contaminants. Extreme caution must be taken when considering new or expanding land uses within these areas of concern.

Planning Area:

The plan encompasses all surface and ground water resources in and running through the counties of Cassia, Gooding, Jerome, Lincoln, and Twin Falls. All five counties are located in South Central Idaho and four of the five counties border the Middle Snake River. Lincoln County, while not bordering the river, is an integral participant because of agricultural return flows, the interaction of the aquifer and the Little and Big Wood Rivers which are major tributaries to the Middle Snake. The five county region contains about 5,100 square miles and has a population of nearly ~~135,000~~ 146,200.

Situation:

The planning area is part of the Snake River Basin located in south central Idaho. The Middle Snake River region, in our definition, includes all surface water and the underlying aquifers. The region's water is impacted by:

- Recreation, tourism, fish and wildlife
- Aquatic ~~nuisance~~ invasive species
- Private, municipal, industrial uses
- Hydroelectric development
- Agricultural uses
- Recharge

Other impacts may come from:

- Cloud seeding
- Climate change
- Federal mandates and court decisions
- The Idaho Nuclear Laboratory (INL)

Recreation and tourism:
Recreation and tourism is increasing along the Middle Snake River corridor. More people are moving to the area because of job opportunities and retirement. Local communities along with regional and state agencies are also doing a better job of promoting the areas many tourist and recreational opportunities. As more people move into or visit the region, there will be increased pressure on existing accesses to the region's water ways.

Aquatic ~~nuisance~~ Invasive species:
Aquatic ~~nuisance~~ invasive species (AIS) are plants and animals that are dependent on aquatic and riparian ecosystems. Introduction and uncontrolled spread of AIS play havoc with native fish and ecological communities as well as recreation, irrigation and power generation. With more water users come more opportunities for the introduction and spread of AIS in our region's waterways.

Hydropower:
Relatively inexpensive hydro power has been a major player in building the regional economy. It has helped to make the desert bloom and bring manufacturing and other jobs to the area. With only five remaining rapids in the Middle Snake River, hydro power on this section of the river is considered to be fully developed under current technology. Opportunities do exist, however, for off-site systems using tributary streams, springs and canals.

Irrigated agriculture:
As with the rest of the nation, there has been a slow, but steady decline of irrigated agriculture land caused by urbanization. Approximately ~~846,000~~ 857,000 acres are irrigated with water from the Snake River, its tributaries, and deep wells in the planning area. ~~In past years the amount of irrigated agricultural land has steadily declined due to urbanization and land retired with the associated water going to other uses such as livestock operations and river flow augmentation. Many perennial streams and agricultural drains contribute~~ As ~~irrigation tail water to the river. As with the rest of the nation, there has been a slow, but steady decline of irrigated agriculture land caused by urbanization.~~ Improper farming practices can impact both our ground and surface water resources through leaching and runoff of nitrogen and phosphorus, however, agricultural land owners including those who utilize manure received from CAFO operators are not required to have nutrient management plans in Idaho.

Concentrated animal feeding operation (CAFO):
Many large dairies, feedlots and aquaculture facilities are located in the five-county area. These operations typically include feed yards and waste water lagoons which, if constructed or maintained improperly, can increase nutrient loads to both groundwater and surface water resources within the region.
A second and possibly more important risk for increased nutrient loading is the improper application of manure to agricultural land. All CAFO operations are required to have nutrient management plans for the application of livestock waste.

Non-irrigated agriculture:
Non-irrigated agriculture land includes livestock grazing and dry land farming. These uses may also contribute to the degradation of the region's ground and surface water resources. Poor dry land farming practices can increase the risk of erosion causing nutrient and chemical bearing sediment to enter rivers and streams while livestock can damage stream banks causing erosion and runoff problems, as well as adding to nutrient levels.

Private, industrial and municipal waste treatment:
Point source dischargers requiring NPDES permits include cities such as Jerome, Buhl, Filer, Twin Falls, Hagerman, Hansen, Gooding, Burley~~, Heyburn~~, Richfield and Shoshone. In addition to the above cities who have NPDES permits the following cities have either lagoons with land application or total containment: Albion, Hazelton, Eden, Castleford, Wendell, Declo, Murtaugh and Dietrich. In addition to the municipalities there are several private and industrial waste water treatment facilities within the region.

The Problem:
The Middle Snake River was considered by many as a working river since development began to occur in the early 1900's. Residents and public officials discovered, however, in the late 1980's and early 90's that we ~~may be working the river to death~~ were overworking the river. Studies, at the time, indicated the river no longer had the ability to clean itself through flushing flows (can only occur during high water years) unless accompanied by large reductions in nutrient, chemical and sediment loading. For this reason total maximum daily loads (TMDL's) were established on this portion of the river by the ~~Environmental Protection Agency with the help of the Idaho Department of Environmental Quality and others.~~ watershed advisory groups and the Idaho Department of Environmental Quality as directed by the Clean Water Act.

~~Other studies showed and continue~~ Monitoring continues to show increasing nutrient loads ~~to the~~ in some parts of the region's ground and surface water supply. ~~Elements such as nitrogen~~ Nitrates, ~~and~~ phosphorus, pharmaceuticals, feed additives and pesticides are indicators of other potential problems which can affect both ground and surface water in the region.

~~Solutions to these problems cannot be successfully implemented on a piecemeal basis. Since~~ The problems with the water quality of the Middle Snake area extend beyond the individual county borders and require a multi-county approach ~~is required~~. By combining their efforts, counties can ensure that the needs of each county can be met without creating unequal hardships. A locally developed plan has the advantage of local input and control of solutions, which recognize the economic, ~~and~~ social and environmental needs of the Local community. If a community understands the need to protect the resource they are more willing to cooperate and even compete to be part of the solution.

One answer to pollution is dilution and three events since 2010 may, with proper safeguards, increase the water supply to the Eastern Snake Plain Aquifer (ESPA). In 2010 the Comprehensive Aquifer Management Plan for the ESPA was adopted by the state legislature. The plan calls for aquifer recharge, ground and surface water conversions and other demand reduction strategies. In 2015 a landmark settlement agreement between irrigation pumpers on the ESPA and canal companies called for reduction of pumping with the intent of restoring the ESPA ground water levels to the 1991-2001 average by 2025. The latest event in 2016 was the Director of the Idaho Department of Water Resources designating the ESPA and its tributary basins as a "ground water management area" broadening the power of the Director to more effectively address the declines in the ESPA.

POLICY STATEMENTS

The following policies are intended to clarify the intent of Cassia, Gooding, Jerome, Lincoln and Twin Falls counties as the means of dealing with current and future events influencing water quality in the Middle Snake region.

IT SHALL BE THE POLICY OF CASSIA, GOODING, JEROME, LINCOLN AND TWIN FALLS COUNTIES TO:

1. Recognize that safe drinking water is essential to economic growth and the well-being of each citizen in the region. Each county will take all steps necessary to protect its drinking water supply from threats within or outside its borders and the borders of this region.

2. ~~Maintain a strong economic base in the Middle Snake River region by adopting~~ When necessary, adopt ordinances and ~~encouraging~~ encourage regulation to implement technologies which will preserve or improve water quality.

3. Work actively to ensure a coordinated effort among federal, state and local government agencies in the implementation and evaluation of the Coordinated Water Resource Management Plan for the Middle Snake region.

4. ~~Work actively to institute reductions in the discharge levels for chemical, physical or biological contaminants when current standards are found to be inadequate.~~

4. Nuclear fuels and radioactive waste shall not be utilized or stored within the counties of the Middle Snake Regional Water Resource Commission.

5. ~~Seek legislation which will allows communities to adopt ordinances that permit more local control of water quality and quantity issues. This will allow communities to better address needs based on local conditions.~~

5. Oppose shipments of radioactive waste to the Idaho Nuclear laboratory (INL) for study or long term storage until the requirements outlined in the 1995 settlement agreement between the state of Idaho and the U.S. Department of Energy are satisfied.

~~6. Work actively to ensure a coordinated effort among federal, state and local government agencies in the implementation and evaluation of the Coordinated Water Resource Management Plan for the Middle Snake River region. (Now item 3)~~

6. Promote sharing the burden of preserving and improving water quality and provide education on the importance of water quality ~~and~~ as well as direction for community efforts to improve the general condition of the waters in the Middle Snake River region. Clubs, schools, civic organizations, industries, elected officials and individual citizens can play an important role in improving the region's water resources for all to use and enjoy.

7. Encourage the preservation of existing ~~wetlands~~ filtration ponds and develop additional filtration ponds in the Middle Snake Region. ~~Wetland~~ Filtration ponds are effective in removing chemical, physical and biological contaminants from return flows and provide valuable wildlife habitat.

8. Discourage development in the region which will negatively impact the quality ~~and~~ or quantity of the region's water resources.

9. Support research and development of possible economic uses for contaminants or potential contaminants.

~~11. Promote sharing the burden of preserving or improving water quality in the region among those who enjoy and use the resource. (Now included in item 7)~~

10. Initiate efforts on a state and local level which will create financial and other incentives to water users to both conserve and improve the quality of the region's water resources.

~~13. Provide education for the people of the Middle Snake River region on our water resources, their uses and the importance of water quality. (now included in item 5)~~

11. Maintain existing free-flowing stretches of the Middle Snake River to enhance water quality and support recreation, ~~and~~ fish and wildlife values.

12. Discontinue use of unlicensed injection wells.

13. Encourage and support the development of new technology including Best Management Practices (BMPs) which will reduce contamination of the waters in the region.

14. ~~Coordinate~~ Facilitate planning efforts with agencies and upstream and downstream water users with regard to water quality and quantity issues.

15. Encourage federal, state and local agencies to ~~insure~~ assure the accuracy and uniformity of compliance data and, after analyzing all available water quality data, to issue written summary reports to the public.

~~19. Work with and encourage the Idaho Department of Agriculture to require state certification of laboratories used for monitoring water and soils in Idaho.~~

RECREATION, TOURISM, FISH AND WILDLIFE
SITUATION STATEMENT

The Middle Snake River and its tributary streams and springs are important to the public as a recreational and aesthetic resource. Currently, the condition of the river, because of maximum daily load limits for various contaminants, has improved, but there is still much to be done to maximize its recreational potential. Tourism can be an important source of income to the region and the number of visitors spending time in the region can be somewhat dependent on water quality. ~~Local residents have enjoyed the use of the region's water resources for recreation purposes, but some areas are still unsuitable for this purpose.~~

Use of the region's water resources for recreation and tourism may also contribute to water quality degradation if the area is not developed utilizing a plan which addresses this concern. Sediment levels in the tributaries and direct runoff into rivers and streams can increase due to increased use of unimproved river accesses. Water quality enhancement improvements to existing recreational facilities and the development of water quality neutral new and expanded facilities are encouraged.

GOAL A: Improve the water quality of the region's water resources to enhance fish and wildlife habitat, increase recreation opportunities and increase the potential for tourism.

OBJECTIVE A01: Create additional recreational access to spread the use. Maintain current and future accesses to reduce the potential for erosion.

STRATEGIES:

A0l.a Seek both public and private means of developing new multiple use accesses to the region's water resources which ~~meet current standards~~ minimize the potential for erosion and contaminants from entering water ways.

A0l.b Ensure proper maintenance of accesses to prevent erosion ~~by involving appropriate governmental and private entities.~~

A0l.c If a current river access is deemed to be undesirable, the access should be closed or restrictions imposed on its use. Corrective action should be taken to improve recreational opportunities.

~~A01.d Enforce current and future regulation on access to the river.~~

A0l.d Discourage the development of recreation and tourism opportunities along the waters of the region which increase the potential for water quality degradation.

OBJECTIVE A02: Increase public awareness of the water quality situation in the region.

STRATEGIES:

A02.a ~~Develop an education and~~ Utilize current information centers to ~~which will~~ focus public attention on all aspects of water usage and water quality in the region.

A02.b Continue to develop educational materials which will emphasize all aspects of water uses in

the region as related to water quality. Videos ~~Slide shows~~, newsletters, and pamphlets could be used to disseminate the information. Dissemination of the information will become a responsibility of local, state, and federal agencies and organizations.

AQUATIC ~~NUISANCE~~ INVASIVE SPECIES (AIS)

~~The scarcity of water in many parts of the region and the~~ Overall values associated with aquatic resources demand actions to protect this resource for the public good. ~~This region must be particularly vigilant for the following reasons:~~ The region must be particularly vigilant concerning the introduction of aquatic invasive species (AIS) because of the costly impact to our agriculture and aquaculture industries as both are dependent on a supply of quality water. Boating and fishing opportunities within the region attract enthusiasts from all parts of the nation. We also have a growing population that is mobile in aquatic recreational pursuits. This increased pursuit of aquatic recreation poses a real threat of introducing AIS to the region. Home and business owners with aquariums and fish ponds, most times unknowingly, may also be responsible for the introduction of AIS.

- ~~Impacts to and from an agricultural economy that depends upon a complex irrigation system and which also has an aquaculture industry that depends on a quality supply of water.~~
- ~~Fishing and boating opportunities on the region's lakes, rivers, reservoirs and streams that attract enthusiasts from all parts of the nation.~~
- ~~Growing populations of new and part-time residents with second homes in or out of the region that spend time pursuing recreational interests on the region's waters.~~
- ~~The tendency for ANS to "hitchhike" on boats and fishing gear commonly moved between states and bodies of water within a growing state.~~
- ~~Citizens of this region are mobile and recreate in neighboring states. They may come in contact with ANS bringing them back to the region's waters.~~
- ~~Impacts by homeowners who have aquariums or fish ponds~~.

Goal A: Member *counties need* to work with each other, the Idaho Department of Agriculture and others to prevent the introduction and spread of ~~aquatic~~ AIS into the waters of the region.

OBJECTIVE A01: Educate the public, ~~and agencies including~~ local governments and other elected officials on the threat posed by AIS and measures to prevent the introduction and spread of AIS throughout the region.

STRATEGIES:

A01.a Aid in the development of a comprehensive education program to raise awareness of AIS introduction and spread for counties and law enforcement.

A01.b Help provide information on AIS to managers of fishing tournaments and various sportsmen and recreational groups.

A01.c Work with other agencies to develop and maintain advertisements, public service announcements, designing programs and other methods of communication with the public to raise awareness of AIS threats and the need for personal actions such as cleaning fishing and boating equipment

A01.d Promote the development of boat cleaning stations at the regions recreation areas.

HYDROPOWER SITUATION STATEMENT

The Middle Snake River has been highly developed as a source of hydropower. This resource has been instrumental in the development of this region. In addition to clean, economical power, hydropower has increased recreation opportunities including boating, fishing, and ~~campground facilities~~ camping.

While hydropower development has been highly beneficial to the region, it has also reduced the amount of wetlands; adversely altered fish and wildlife habitat; ~~reduced~~ lowered oxygen levels in the water; reduced the natural cleansing ability of the river; and raised the temperature of water in many portions of the river. Recent technology in hydropower, such as low head systems and co-generation plants, has compounded water quality problems associated with hydropower production. Dams and diversions have eliminated long, free-flowing stretches of the river, affecting fish migration patterns which are essential for the reproduction of several species.

GOAL A: Limit the development of hydropower facilities on the Middle Snake River.

OBJECTIVE A0l: Allow no development of hydropower facilities on the Middle Snake River which will eliminate the remaining free-flowing reaches of the river or which will contribute to water quality degradation.

STRATEGIES:

A01.a Ensure that modifications to existing hydropower facilities have no negative impact to water quality.

~~A0l.b Minimize size and number of artificial impoundments.~~

A0l.b Maintain current wetland habitat or mitigate to compensate for loss of habitat.

GOAL B: Encourage the development and implementation of new technology which will reduce or eliminate the negative impacts of current facilities on the Middle Snake and its tributaries.

OBJECTIVE B0l: Encourage adoption of new technologies (related to water quality) to be incorporated into existing facilities at the time of re-licensing.

STRATEGIES:

B01.a Maintain current storage capabilities by reducing sediment loading in impounds. Reduce erosion and solids entering the river which are responsible for reducing the capacity of impounds.

B01.b Investigate the feasibility of dredging sediment from impounds to increase storage capacity in the existing system.

~~B01.c Minimize daily peaking operations related to power generation by encouraging power conservation.~~

PRIVATE, MUNICIPAL, COMMERCIAL AND INDUSTRIAL WASTE TREATMENT SITUATION STATEMENT

Many municipalities within the region discharge from their waste treatment plants into the Snake River or one of its tributaries, while other cities use land application methods of handling waste. ~~Additionally,~~ There ~~are~~ is an increasing number of septic systems being used and some older systems may still discharge into injection wells or open ditches. ~~These practices pose a potential threat to water quality from organic, bacteria, nutrients, suspended solids, and heavy metal loading. Runoff and seepage from municipalities contain heavy metal, petroleum products and sediment which also contribute to water quality degradation. As population and industrial activity increase within the region the quantity and quality of the region's water may be adversely affected~~. Storm water runoff and seepage from public, private, commercial and industrial properties can also result in harmful discharges to the waters of the region. When proper procedures for handling waste material are not followed there is a potential for contamination of water from organic toxins, bacteria, nutrients, suspended solids, pharmaceuticals, chemicals, petroleum and heavy metals. Municipal, ~~industrial and~~ commercial and industrial waste treatment requires an NPDES permit if discharged to waters of the U.S.

~~Public, private, commercial and industrial water uses can also result in discharges containing sediment, organic toxins, bacteria, nutrients and suspended solids. Without proper application, treatment and monitoring of these discharges, the potential exists for contamination of the aquifer and the above ground water resources. Future water needs may also contribute to water quality problems within the region.~~

GOAL A: Improve the surface water quality of the region as related to private, municipal, commercial and industrial uses.

OBJECTIVE A0I: Assure the quality of the water being discharged into the surface waters of the region from municipal, commercial and industrial sources.

STRATEGIES:

A01.a Monitor current and future discharges into surface water by municipalities, commercial and industrial uses into the surface waters of the region.

A01.b ~~Encourage~~ Local government to coordinate efforts to inventory current data on water condition within the region to identify current water quality problems and take steps to correct those problems until sustainable standards are met for the designated use.

A0I.c Encourage local government to pass and enforce land use planning ordinances regarding public, private, commercial and industrial waste treatment systems that will provide protection for the ~~surface~~ waters of the region. This includes the requirement for an NPDES permit. Such regulation to include surface water runoff.

A01.d Municipalities, private entities, commercial and industry uses are encouraged to update equipment and implement new technology to reduce biological, chemical and physical contaminants from being discharged into the surface water resources ~~in~~ of the region.

~~A01.e Encourage treatment of surface water runoff to ensure contaminants are not introduced into the surface waters of the region.~~

~~GOAL B: Protect and improve the ground water quality within the region as related to municipal, commercial, industrial and private uses.~~

~~OBJECTIVE B01: Assure that waste water from municipal, commercial, industrial and private sources does not degrade the aquifers within the region.~~

~~STRATEGIES:~~

~~B01.a~~ A01.e Require residential subdivisions to use municipal waste treatment systems unless it has insufficient capacity and the municipality is unable to expand the system within a reasonable period of time. If a municipal system is not available, the developer must ensure the use of septic systems which incorporate engineering based on soil type, geology, depth to ground water, and nutrient and biological information. The resulting system should be based on the best available science to minimize any negative impact to the aquifer. Residential wells in the development are to be tested, as deemed necessary by the South Central Public Health District, with the results being reported to that agency.

~~B01.b~~A01.f Require commercial and light industrial land uses to use municipal waste treatment systems unless it has insufficient capacity and the municipality is unable to expand the system within a reasonable period of time. If a municipal system is not available, the developer must develop a waste treatment system which incorporates engineering required by the NPDES permit. ~~based on soil type, geology, depth to ground water, nutrient and biological information. The resulting system should be based on the best available science to minimize any negative impact to the aquifer.~~

~~B01.c~~A01.g Increase monitoring and enforcement of regulations for commercial and small industry uses for: chemical storage and handling; chemical mixing and loading; chemical waste disposal and chemical spills; fuel storage; solid waste disposal; and well construction and abandonment.

~~B01.d~~A01.h Recommend that all rural residents in the region test their well and septic systems at regular intervals and as deemed necessary.

~~B01.e~~A01.i French drains, shallow injection wells and filtration ponds are to be constructed to a standard to remove contaminants from the water being discharged to the aquifers of the region. Municipalities, industry and private entities, however, are discouraged from using french drains, injection wells and filtration ponds as an alternative to treatment of runoff by waste treatment systems.

~~B01.f~~A01.j ~~Encourage~~ Request continued monitoring for pharmaceuticals in ground water and develop educational and regulatory methods to deal with areas of concern within the region.

~~B01.g~~A01.k Ensure the enforcement of current regulations.

B01.hA01.l Ensure the use of the best information available in when developing or changing land use plans including hydrology, geology, soil types, and nutrient and biological information.

GOAL B: Protect surface and ground water quality within the region as related to heavy industry.

OBJECTIVE B01: Assure that pollutants from heavy industry do not degrade the surface and ground water within the region.

STRATEGIES:

B01.a The developer shall have engineered a private waste treatment system with contingency plan reflecting no negative impact from escape or discharge of pollutants to surface and ~~under~~ground water resources. The developer must develop a waste treatment system which incorporates engineering required by an NPDES permit. ~~based on the best available data on soil type, geology, depth to groundwater, flow and nutrient, chemical and biological information.~~

B01.b The developer shall provide for the construction and use of adequate monitoring wells with samples analyzed at regular intervals ~~with~~ and test results being forwarded to the appropriate local, state and federal agencies.

B01.c The developer shall have engineered structures for fuel and commodity storage reflecting no negative impact from the escape of pollutants to the surface and ground water resources of the region.

B01.d When applicable, the developer shall have engineered a solid waste landfill that shall reflect no negative impact to surface and ground water resources.

B01.e When applicable, the developer will submit a dust remediation plan during construction and after construction ~~when~~ if utilizing solid fuels, reflecting no negative impact from these operations to surface and ground water resources.

B01.f When applicable, the developer will submit a smoke stack remediation plan indicating that heavy metals, chemicals, or biological contaminants being released from the stack have no negative impact to surface water and settling particulate matter will not leach into ground water.

Measurement procedures: Methods and procedures for the determination of the existence of any dangerous and objectionable elements shall conform to applicable standard measurement procedures by the American Society of Testing Materials (ASTM) or other appropriate authority

FIELD
AGRICULTURAL
SITUATION STATEMENT

Agriculture is the primary user of water in the region and is also the mainstay of the economy in South Central Idaho. The region has about ~~3,700~~ 3,428 farms encompassing over ~~846,000~~ 857,000 acres which accounts for about 45% of Idaho's total agricultural product. Most of the irrigated lands ~~range from~~ receive 8 to 11 inches of ~~rainfall~~ precipitation annually so crop production in most of the region is impossible without irrigation from ~~above ground~~ surface and ~~underground~~ water sources. Much of the irrigated land has been converted over the years to sprinkler irrigation. This conversion along with improved management practices by canal companies, has led to a reduction of ~~waste water return flows~~ return flows to ~~the~~ rivers and incidental recharge to ground water within the region.

Irrigation water management practices can still result in returns which are typically higher in biological, chemical and physical contaminants than when it was taken from the rivers and aquifers of the region. Some injection wells are still being used to provide drainage for tail water, which may also contribute contaminants to the aquifer. Surface irrigation plays an important role in recharging the aquifers, but care must be taken to limit pollutants from this source. The following goals, objective and strategies have been developed to meet the overall objective of this plan.

GOAL A: Encourage conservation of water to allow for future uses within the region.

OBJECTIVE A0I: Use only the amount of water necessary on crop lands to meet the needs of the specific crop being produced.

STRATEGIES:

A01.a Promote ~~and help prioritize~~ educational programs on proper water management in regard to crop requirement, irrigation scheduling, soil water holding capacity and consumptive use.

~~A01.b Encourage installation of water saving devices.~~

GOAL B: Improve the quality of return flows.

OBJECTIVE B0I: Reduce the amount of biological, chemical and physical contaminants discharged in return flows.

STRATEGIES:

~~B01.a Encourage the use of best management practices (BMP's) such as irrigation management, water conservation, residue management, reduced and delayed tillage, sprinkler systems, proper furrow length, vegetative filtration strips, cropping systems and the use of polyacrylamide (PAM).~~

B01.a Encourage continued research and adoption of new BMP's to reduce sedimentation, loss of nutrients and leaching of nutrients.

B01.b ~~Continue~~ Support educational programs of Soil Conservation Districts, the University of Idaho ~~Cooperative~~ Extension ~~Service~~ and agri-business to demonstrate and improve BMP's.

B01.~~dc~~ Encourage canal companies and farmers to develop ~~wetland~~ filtration systems and settling ponds to remove sediment, nutrients and chemicals from irrigation return flows. Also, encourage the continued improvement of existing ~~wetlands~~ filtration systems and settling ponds as needed.

B01.~~ed~~ Encourage increases in local, state and federal funding for agricultural water quality projects in the region.

B01.~~fe~~ Encourage education and enforcement of the Idaho Stream Channel Protection Act which pertains to stream alteration projects.

B01.~~gf~~ Encourage Soil Conservation Districts in the region to coordinate planning, implementation and funding for water shed treatment using BMP's. ~~to meet the TMDL clean water requirements.~~

OBJECTIVE B02: Implement improved irrigation and soil fertility management to reduce movement of biological, chemical and physical contaminants through the soil profile to surface and subsurface water.

STRATEGIES:

B02.a Match animal waste, agricultural solid waste and chemical fertilizer application with crop usage.

B02.b Match irrigation applications more closely to evapotranspiration (ET) based on specific crops and soil types.

B02.c Encourage additional research by the University of Idaho and the ~~Agricultural Research Service~~ United States Department of Agriculture on nutrient movement in soils and on crop nutrient requirements.

B02.d Encourage additional private, state and federal funding for research into nutrient movement in soils and crop use to supply additional data to update the University of Idaho's fertilizer guides.

B02.e ~~Develop~~ Encourage educational programs ~~in~~ through partnerships ~~with~~ among soil conservation districts, canal companies, school systems and others, concerning proper usage of nutrients in the region.

B02.f Encourage continued research for new voluntary and mandatory BMP's by the Idaho Department of Agriculture and others to reduce nutrient loads in the areas of the region where nitrogen inputs exceed plant uptake.

B02.g Support research and use of USDA approved genetically engineered crops to reduce the use of pesticides ~~and fertilizer.~~

B02.h Support research and adoption of alternative practices and use of new technology to reduce the use of fertilizers.

GOAL C: ~~Increase monitoring and enforcement of non-point water quality standards on~~ Encourage ~~increased~~ monitoring of discharge by non-point source dischargers to the waterways and aquifers of the region.

OBJECTIVE C01: Increase monitoring of discharge associated with crop production and storm runoff.

STRATEGIES:

C01.a Systematically monitor return flows of concern as identified by the Idaho Department of Environmental Quality.

C01.b Encourage the assessment of problem areas for ground water quality including point of use and points of contamination.

C01.c Encourage the identification of site variability so that ground water quality data is updated and interpreted accurately.

~~C01.d Systematically evaluate state and federal parameters for TMDL's to determine acceptability of discharge.~~

C01.d Encourage the evaluation and dissemination of ground water quality data including trend information and site variability.

C02.e Identify any areas where current and future use of ground water for drinking water supplies may pose a public health threat.

~~C01.f Encourage the development of products such as geographic information systems and probability mapping which will facilitate management decisions regarding the resource.~~

GOAL D: Protect ground and surface water from potential site specific contamination from field agriculture and agricultural related industries.

OBJECTIVE D0l: Encourage increased monitoring of potential site specific water quality programs and standards ~~to~~ for rivers and aquifers of the region.

STRATEGIES:

D01.a Encourage increased monitoring and enforcement of regulations for agricultural chemical storage and handling, chemical mixing and loading, chemical application practices, chemical waste disposal and chemical spills, solid waste disposal, deep and shallow injection wells and other underground disposal methods and well construction, abandonment, and underground fuel storage tanks.

OBJECTIVE D02: Work with federal, state and local agencies to increase the effectiveness of ~~regulatory~~ water quality programs dealing with field agriculture.

STRATEGIES:

D02.a Work with and encourage legislators and agencies to adequately fund ~~regulatory~~ water

quality programs for field agriculture.

D02.b Encourage all ~~regulatory~~ agencies who participate in water quality monitoring and adopting or enhancing BMP's to do an annual report to the public covering their accomplishments ~~of all regulatory programs~~ dealing with water quality concerns ~~within~~ in the region.

D02.c Utilize education as the first step ~~in the~~ to any regulatory process.

DO2.d Encourage the development of products such as geographic information systems and probability mapping which will facilitate management decisions regarding the resource.

ANIMAL AGRICULTURE SITUATION STATEMENT

Animal Feeding Operations (AFO's) and particularly the dairy industry has a major impact on the regional economy and many businesses throughout the region are supported in whole or in part by the industry. Currently the dairy industry in Idaho ranks 4th in the nation for dairy cows and 3rd in milk production. Our region accounts for about 75% of the states total milk production. ~~Beef production~~ Livestock raised for beef, other than dairy livestock sold for beef, also has an impact on the region's economy. ~~but is less easily quantified as there are only a few small feedlots within the region~~. Idaho is ranked ~~14th~~ 13th in the nation for beef cattle, but when dairy is removed this region only has a small percentage of the state's total.

AFO's have grown in numbers and size. An increasing number of livestock create an increased potential for contamination, ~~particularly phosphorus,~~ in surface and ground water through runoff and leaching. In some cases producers are improperly applying both solid and liquid livestock waste to farm land increasing the risk of contamination to surface water and, over time, ground water. Areas of the region that feature high water tables, fractured basalt or ~~course~~ coarse underlying material are of particular concern for ground water. Research into new technologies is ongoing for waste handling and feed requirements. Current research suggests that reduced nitrogen and phosphorus in feed rations will reduce these elements from animal excretion without affecting productivity.

Aquaculture is an important industry within the Magic Valley. The industry is responsible for about ~~35.4~~ 40 million pounds of trout annually which is about ~~65%~~ 70% of the total trout sold in the United States. The majority of the water used in fish production comes from underground springs along the walls of the Snake River Canyon, but a few fish facilities are located on tributary streams. Fish propagation facilities are non-consumptive water users, and waste management is an integral part of facility design and operation. Facilities currently operate under NPDES permits and a TMDL with strict limits on the amount of nutrients ~~and settleable~~ and suspended solids allowed in the water leaving a facility. Regular monitoring of facility discharge for total phosphorus has provided much needed data on the actual impact of aquaculture on the Middle Snake River. Future reductions in the discharge of phosphorus will largely depend upon the results of research to continually improve fish feeds. Current limits are enforced and future limits on solids and total phosphorus must be based on sound scientific evaluation of good data.

I. Animal Feeding Operation (AFO):

Animal Feeding Operation are agricultural operations where animals are kept and raised in confined situations. AFO's generally congregate animals, feed, manure, dead animals and production operations on a small land area. Feed is brought to the animals rather than the animals grazing or otherwise seeking feed in pastures. Animal waste and wastewater can enter water bodies from runoff, spills or breaks of waste storage structures (due to accidents or excessive rain), and agricultural application of manure to crop land.

2. Concentrated animal feeding operations (CAFO):

A CAFO is an animal feeding operation that is considered a point source discharger of waste through man-made conveyance or directly into the waters of the United States or is designated a CAFO by a permitting authority on a case-by-case basis. To be a CAFO, a facility must first be defined as an animal feeding operation (AFO). CAFO discharges are regulated through the NPDES program of the United States Environmental Protection Agency.

Enforcement of AFO regulations have been improving, but agencies still lack adequate resources to meet the demands of increasing regulations and animal numbers. Current regulations require monitoring of

containment facilities and the management of nutrients applied to crop land.

GOAL A: Improve management of the water resources to improve water quality in the region.

OBJECTIVE A0I: Better manage water used in animal feeding operations (AFO's).

STRATEGIES:

A01.a Encourage producers to reduce the amount of water used to manage manure and the facility.

A01.b Where applicable, encourage the recycling of water used, for facility operations.

A01.c Recommend replacing liquid flushing systems with dry systems such as scrapping, vacuuming, composting, etc.

OBJECTIVE A02: Use manure management systems that will allow the producers to transport nutrients to other areas which will provide for greater dispersion.

STRATEGIES:

A02.a Encourage the use of proper livestock manure composting technologies ~~by~~ using Natural Resource Conservation Service (NRCS) guidelines.

A02.b Encourage the use of anaerobic digesters to stabilize the nutrients and for energy conversion, waste management and other uses, particularly in areas of the region found to be susceptible to ground water contamination.

A02.c Encourage the use of field injection systems for liquid manure application at agronomic rates.

A02.d Encourage the use of precision agricultural tools and update BMP,s for the application of solid, slurry and liquid manure and waste.

GOAL B: Protect ground and surface water from potential site specific contamination from animal agriculture and other related industries.

OBJECTIVE B01: Reduce nutrients in runoff and leaching on crop land where livestock waste has been applied.

STRATEGIES:

B01.a Seek compliance with all federal, state and local regulations for livestock operations. All livestock waste applied to crop land to match the nutrient needs of the crop and proper irrigation practices followed to reduce the possibility of leaching contaminants to the aquifer. Continuing education for livestock owners and managers through the University of Idaho and the NRCS is highly recommended for proper implementation, application, evaluation and modification of the required nutrient management plan.

B01.b Encourage the timely incorporation of livestock waste to reduce the potential of contaminated runoff.

B01.c Facility design and other management requirements of a proposed or modified AFO site to be based on soil type, geology, depth to ground water and flow, distance from rivers, springs or any water conveyances, and nutrient and biological information.

B01.d Encourage more research and development to improve water and waste management systems and to reduce nitrogen and phosphorus in feeds.

B01.e Encourage continued monitoring for pharmaceuticals in ground and surface water and develop educational and regulatory methods to address areas of concern within the region.

B01.f Encourage increased monitoring and enforcement of regulations of animal agriculture for chemical storage and handling, chemical mixing and loading, chemical application practices, chemical waste disposal and chemical spills, solid waste disposal, deep and shallow injection wells and other underground disposal methods, well construction and abandonment, and above ground and underground fuel storage.

OBJECTIVE B02 : Encourage regulatory compliance for discharges associated with aquaculture production.

STRATEGIES:

B02.a Encourage the use of ~~best management practices and~~ waste handling technology at all fish propagation facilities.

B02.b Seek accurate reporting and encourage a comprehensive evaluation by the Idaho Department of Water Resources, Department of Environmental Quality and the Environmental Protection Agency on flow, solids and nutrients.

B02.c Encourage research into fish feeds and waste management techniques that will reduce nutrients and solids from leaving a facility.

OBJECTIVE B03: Encourage public and private entities to better coordinate the monitoring for discharge associated with animal agricultural production.

STRATEGIES:

B03.a Encourage state, federal and private entities, which are responsible for monitoring in the region, to develop and implement a regional coordinated monitoring plan.

B03.b Encourage all public and private entities involved in monitoring programs to allocate adequate resources to create a coordinated evaluation and reporting system.

B03.c Continue to evaluate standards and parameters that are currently being used to determine acceptability of return flows to the waters of the region.

GROUND WATER RECHARGE SITUATION STATEMENT

Ground water levels have been dropping for many years. There are several reasons including the increase in ground water pumping since 1950, conversion to sprinkler irrigation systems and periods of intermittent drought. A significant amount of natural recharge occurs in the region from losses in the various canal systems. This, however, is no longer adequate to maintain ground water levels. It is for this reason that the Idaho Department of Water Resources is conjunctively managing the surface and ground water resources in the Snake River basin. The Idaho Water Resource Board approved a Comprehensive Aquifer Management Plan (CAMP) which was developed by water users and others residing on the Eastern Snake Plain Aquifer. The CAMP plan outlines several ways to replenish the aquifer, but a significant element will be recharge. The legislature has authorized some funding for recharge efforts in the region, but long term funding sources have not been identified. Until long term funding is secured, recharge in the region will be at the pleasure of the legislature ~~and so at least some recharge will take place in this region.~~ After CAMP was approved, ground and surface water users signed an agreement seeking to increase the level of the Eastern Snake Plain Aquifer to its 1991-2001 average level by 2025. There are still some hurdles to overcome, however, such as the availability of recharge water, availability of canal systems to wheel the recharge water, identifying land to use as recharge sites and addressing public concerns for water quality.

GOAL A: Ensure that ground water quality is maintained when managed artificial recharge occurs.

OBJECTIVE A01: Water used specifically for recharge not to exceed acceptable concentrations of biological, chemical and physical contaminants as established by the Idaho Department of Water Resources ~~in conjunction with~~ using guidelines developed by the Idaho Department of Environmental Quality ~~of biological, chemical and physical contaminants~~.

STRATEGIES:

A0l.a Monitor concentrations of biological, chemical and physical contaminants of water being used for recharge prior to, ~~and~~ during ~~recharge~~ and down gradient of recharge site.

A0l.b Use recharge basins that ensure proper filtration prior to reaching ground water.

A0l.c In areas where direct recharge occurs, ensure that water quality is tested and analyzed prior to injection.

Replaces pages 49 through 55 of the plan

Source Water Protection

The safety of all drinking water in this region is critical to the health and welfare of its residents. The Idaho Department of Environmental Quality (IDEQ) has developed a program that assists communities in protecting their water sources through the development of a source water protection plan. IDEQ will review and certify plans that contain all elements needed for certification. IDEQ encourages it to be a cooperative effort between counties, cities, drinking water associations and the IDEQ to identify vulnerability of public water systems and assess all possible sources of contamination. Communities may decide that certain land use restrictions and prohibitions may be necessary to provide adequate protection for these valuable drinking water sources.

GOAL A: Source Water Protection,

OBJECTIVE A01: Assure safe drinking water to public water systems which are defined by the IDEQ as a system that provides water to the public for human consumption through pipes or other constructed conveyances, if such system has at least 15 service connections or regularly serves an an average of at least 25 individuals at least 60 days out of the year.

STRATEGIES:

A01: Source Water Protection is a voluntary effort a community can implement to help prevent contamination of the source water that supplies its public water system. Source water protection planning by public water systems described under objective A01 above is encouraged.

A02: All source water protection plans duly adopted by the public water system outlined in objective A01 above should be presented to the Board of County Commissioners in each county if a county ordinance is proposed. Submissions must include the following:

1. Location of wellheads protected by the plan.
2. Legal description of proposed vulnerability tiers based on time of travel within the county.
3. Water quality trend within proposed protected area.
4. Identification of prohibited uses within each vulnerability tier and evidence to support prohibition.

A03: After review of the source water protection plan and the water quality portion of this plan, the county commissioners may accept the premise of the source water protection plan. If accepted the commissioners may adopt an ordinance establishing wellhead vulnerability tiers and prohibitions within the county. An ordinance can be based on a template developed by the Idaho Association of Counties.

A04: if a source water ordinance is created prohibiting certain land uses within protection tiers, each prohibited use may include this or similar language: prohibited unless a

licensed engineer develops a site utilization plan and/or waste disposal plan with contingency plan showing acceptable levels of protection to ground or surface water. Design shall consider soil type, geology, depth to ground water, water flow and soil tests indicating current nutrient, biological and chemical load information for the proposed site.

A05: Developer may be required to establish an ongoing water quality monitoring program and report the results to the appropriate state agency and county planning and zoning commission. If monitoring indicates a negative trend, developer must show steps to be taken to correct water quality degradation unless degradation is shown to come from a source upstream or up-gradient from the subject site.

DEFINITIONS

~~1. Acceptable Level of Water Quality: A Level of water quality at or above minimum state and federal standards which is acceptable to the majority of the people within the community, based on factual data taken from sources such as the Division Idaho Department of Environmental Quality, and the public health Department district and the Environmental Protection Agency.~~

2. **Aesthetics:** Doctrine that the principles of beauty are basic to other moral principles. A devotion to emphasis of beauty, a branch of philosophy of the beautiful and judgments concerning beauty.

3. **Best Management Practices (BMP):** A measure determined to be the most effective, practical means of preventing or reducing pollution inputs from non-point sources in order to achieve water quality goals. A variety of definitions exist for best management practices. The definition used in the Idaho Department of Health and Welfare (1985) water quality standards is as follows: Best Management Practice is a practice or combination of practices determined by the department to be the most effective and practicable means of preventing or reducing the amount of pollution generated by non-point sources."

4. **Contaminants:** Any chemical, ion, radio nuclides, synthetic organic compound, microorganism waste or other substance which does not occur naturally or which naturally occurs at a lower concentration.

5. **Co-generation:** The practice of using water to generate electricity which is sold to a primary utility. In this case, a secondary use of the water which results in the generation of electricity.

6. **Commercial:** As defined by the member counties.

7. **Development:** Residential, industrial, commercial use which could include, but are not limited to hydro facilities, dairies, crop-land, subdivisions, fish hatcheries, road construction, industrial and commercial land uses, parks and recreational areas.

8. **Evapotranspiration (ET):** Water that is transpired from the leaves of plants and evaporated from the soil. ET data is used in water management decisions because it represents the amount of water consumed by irrigated agriculture and other land uses.

9. **Filtration ponds:** Also referred to as farm ponds. These are manmade structures capturing tail water and allowing sediment and contaminants to settle out. The pond can serve a dual benefit of recycling irrigation water while also recharging ground water.

10. **Industry:** As defined by the member counties.

11. **Municipalities:** A city, town or other district having local, self-government or residential subdivisions and Planned Unit Development (PUD).

12. **NPDES:** The National Pollutant Discharge Elimination System (NPDES) permit program under the EPA and administered by the Idaho Department of Environmental Quality that controls water pollution by regulating point sources that discharge pollutants into waters of the United States

13. **NRCS:** Natural Resources Conservation Service is under the U.S. Department of Agriculture and works with landowners through conservation planning and assistance designed to benefit the soil, water, air, plants and animals that result in productive and healthy ecosystems.

14. **Nuclear fuel:** a fissionable substance which will sustain a chain reaction.

15. **Prohibited Uses:** Those land uses which are not allowed in specific zones under a county zoning ordinance.

16. **Point Source Discharger:** Industrial, municipal or other facilities that discharge pollutants directly into the waters of the United States or are defined as such. NPDES permits are required.

17. **Radioactive waste:** Substances which, according to the EPA standards, emit harmful amounts of radioactivity.

18. **Recreation Use:** Use of the waters of the region for those activities which are usually considered to have recreational value such as boating, hiking, picnicking, hunting and fishing.

19. **Settleable Solids:** Those solids which would settle out of solution based on criteria used by the Idaho Department of Environmental Quality as related to settling time and conditions which would not ordinarily be found if returns were from naturally occurring sources.

20. **Source Water:** Any aquifer, surface water body or water course from which water is taken either periodically or continuously by a public water system for drinking or food processing purposes.

21. **Suspended Solids:** Are those solids which remain suspended in water being discharged in returns to the waters of the region. These solids are those found in addition to those which would not ordinarily be found if the returns were from naturally occurring sources.

22. **Time of Travel Areas:** The land area plotted based upon the time for a particle of water to move from a specific point in the aquifer to a well or spring that serves as a drinking source. Time of Travel Areas are those calculated or approved by the Idaho Department of Environmental Quality (IDEQ) and maintained in the public record of IDEQ.

23. **TMDL:** (total maximum daily loading) A calculation of the total maximum amount of a pollutant that a body of water can receive each day and still meet water quality standards.

24. **Vulnerability Tiers:** An area of four (4) functional tiers that correlate with the vulnerability surrounding each public water system well or spring. Each tier is based on the time of travel for possible contaminants to the public water system.

25. **wellhead:** The upper terminus of a well, including adapters, ports, seals, valves and other attachments.

26. **Wetlands:** A collective term for marshes, swamps, bogs and similar areas found in generally flat vegetated areas, in depressions in the landscape and between dry land and water along the edges of streams, rivers, lakes and coastlines.

Source Water Protection Plan

1.0 Introduction:

Source water protection is a voluntary program implemented at the local level of government. Cities, drinking water associations and counties develop source water protection plans to outline the process that will be used to help prevent contamination of ground water that supplies community drinking water. All drinking water in this region is from ground water sources and the protection of that resource is critical to the health and welfare of the residence. Source water protection will help protect this resource from ground water contamination by monitoring land uses that occur within the area overlying the aquifer from which the wells draw water. While this plan is specifically for source water protection of cities and drinking water associations, county government must protect individual private wells when considering land use and land uses changes. This is done by implementing the Coordinated water Resource Management Plan as adopted by the member counties. The term "Source Water Protection" is used throughout this plan and is synonymous with Source Water/Wellhead Protection.

Many materials such as pesticides, fertilizers, organic chemicals, and human and animal waste can contaminate ground water. The degree of contamination depends on many factors including: soil characteristics, volume of contaminant, contaminant properties, climate and ground water flow. Once ground water becomes contaminated it is difficult and expensive to clean up. A public/private water system (PWS) supplied by the aquifer that has become contaminated will probably be required to do additional monitoring and may need to install water treatment equipment or find a new source of drinking water.

1.1 Source Water System:

A city, source water association, and county drinking water system includes all wells that serve a city population or a system serving 15 service connections used by year-round residents and/or regularly serves at least twenty-five (25) year round residents.

1.2 Source Water Protection Steps:

A city and county drinking water plan, in accordance with the Idaho Source Water/Wellhead Protection Plan, and which has followed the 5-step process for Source Water/Wellhead Protection. These five steps are:

1. Form a community advisory board
2. Delineate the land area to be protected
3. Identify potential sources of contamination
4. Manage the drinking water protection area
5. Plan for the future

1.3 Source Water Protection and Source Water Assessment:

Source water assessment involves two of the five drinking water protection steps discussed above. These two steps are delineation and contaminant inventory. An additional source water assessment step includes a susceptibility analysis, which helps identify contaminant threats to the system by evaluating land use, contaminant sources, well construction and hydrologic conditions such as geology and soil type. By pursuing source water protection, counties are addressing the primary goal of the source water process.

2.0 Community Advisory Board:

The members of the source Water Protection Advisory Board for a public water system are appointed by a city council or members of a drinking water association if not owned by a city. The county commissioners may also appoint members and form a joint advisory board. County appointments, if any, shall be as determined by the Boards of County Commissioners.

2.1 Duties of the Advisory Board:

An Advisory Board Coordinator, appointed by the city or members of a drinking water association, has the responsibility of planning future board meetings and following through with the implementation of the plan. The Advisory Board Coordinator will also be the designated contact in case of a water system emergency, and will be the lead contact for any outside reference to this plan.

2.2 Duties of the Source Water Advisory Board:

- The advisory board will hold biannual meetings to review and update the plan and its components.
- Evaluate existing and future city and county ordinances and regulations for their applicability to drinking water protection.
- Review potential contaminant source lists generated by the Idaho Department of Environmental Protection (IDEQ) databases and verify existence and location. Add any potential sources missed by the database search including historical sites.
- Update the potential contaminant source inventory
- Evaluate new sources for their risk to the system
- Prioritize the contaminant risk of point sources within all zones and then develop and implement protection strategies to manage any potential contaminant.
- Assess non-point sources, determine potential risk, develop and implement protection strategies.
- Review and update the contingency plan of the city or drinking water association.
- Use information materials found in "Protecting Drinking Water Sources in Idaho" manual and other sources to implement public education and outreach activities.
- Update city and county source water protection ordinances to conform to an updated plan and delineations.

3.0 Establishment of Well head Vulnerability Tiers:

Surrounding each PWS well shall be four (4) functional tiers that correlate with the vulnerability of a PWS well to contamination. Each tier shall be subject to the functional, use and activity limitations prescribed by the **jurisdiction** zoning ordinance.

3.1 Delineation:

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into vulnerability tiers (tiers indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. Washington Group, International (WGI) used a refined computer

model approved by the Environmental Protection Agency (EPA) in determining the time-of-travel (TOT) tiers for water associated with the Southwest Eastern Snake River Plain aquifer. The computer model uses site specific data assimilated by IDEQ and WGI from a variety of sources including local area well logs and hydro-geologic reports. All data used by WGI are available from IDEQ upon request.

4.0 Potential Sources of Ground Water Contamination:

An inventory of potential point sources of contamination is the third step of a Source Water Protection Plan. Point sources are facilities and/or activities that store, use or produce, potential contaminants regulated under the Safe Drinking Water Act. There must be a potential for a release of those potential contaminants at a high enough level that could affect drinking water quality. A release, however, may never occur from a listed point source if the facility is using best management practices (BMP) that are designed to reduce contamination risk.

Sources that could potentially contaminate the drinking water supply for a city, drinking water association and county include both point and non-point sources of contamination. Point sources of contamination occur at distinct locations. They are often regulated and require permits or registration for facilities that use, store or sell those materials. Non-point sources of contamination often occur over large areas and can result from normal every day activities such as lawn chemical usage or agricultural activities.

4.1 Point Sources:

There is a two phased contaminant inventory of the study area. The first phase involves identifying and documenting potential contaminant sources with the county source water assessment areas through the use of computer databases and Geographic Information System maps developed by the IDEQ. The second, or enhanced phase of the contaminate inventory is conducted by the advisory board to identify and add any additional potential sources in the area. A contaminant inventory for point and non-point sources of a study area, once approved by the county commissioners, will be attached to the counties Drinking Water Protection Ordinance as an exhibit.

An effective source water protection program must be tailored to the particular local source water protection area. Communities with fully developed source water protection programs should incorporate many strategies both regulatory (zoning) and non-regulatory (education) in nature. Any spills from the potential contaminant sources listed as an exhibit to the county Source Water Protection Ordinance should be carefully monitored, as should any future development in the delineated areas. Best management practices aimed at reducing the leaching of pollutants within the designated source water areas should be continually reviewed and updated as necessary.

Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the short term. A strong public education program should be a primary focus of any source water protection plan. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems and the importance of water conservation to name a few. Major transportation corridors may cross the delineations and the Department of Transportation should be involved in protection activities. Source water protection activities for agriculture should be coordinated with the Idaho

Department of Agriculture, the Soil Conservation Commission, local Soil Conservation Districts and the Natural Resources Conservation Service.

5.0 Source Water Protection Management Tools:
A combination of regulatory and non-regulatory methods will be utilized to manage contaminant sources located with a Source Water Protection Area.

Regulatory methods can include source water protection ordinances, zoning ordinances, design standards of new or existing facilities and mandatory use of certain practices to reduce or prevent pollution.

Non-regulatory approaches rely on voluntary implementation of education and information outreach programming to be effective. The ultimate goal of public education is to empower the public so they can implement source water protection efforts.

5.1 — Regulatory Approaches:

The county shall cite the Idaho Rules governing Public Drinking water Systems, which prohibits any potential contaminant source from within the setback area of a public drinking water well. Other regulatory options the county may pursue include adoption of a Source Water Protection ordinance, overlay district development, zoning and comprehensive land use plan modifications, bonding, building codes, design standards, performance standards, potential source prohibitions or restrictions, site plan reviews, special permitting or reviews, zoning ordinance and subdivision ordinance.

5.2 Non-Regulatory Approaches:
These management approaches are intended to reach as broad a spectrum of the community as possible. Protection of a drinking water source is only possible when the whole community cooperates to achieve protection. Public education is an essential tool for drinking water protection, and the majority of the non-regulatory approaches described below rely on public education for effective implementation.

- Groundwater Guardian Community:

  The Groundwater Guardian Program supports education, recognizing and connecting communities protecting ground water. It is designed to empower local citizens and communities to take voluntary steps toward protecting their ground water resources. To achieve Groundwater Guardian status, a community must submit annual entry forms and develop and implement result oriented activities. The Guardian Program application materials are available on-line at the Groundwater Foundation's web site at www.groundwater.org (in the Groundwater Guardian section).

- Public Education:

  An Advisory Board Coordinator will provide ongoing public education to the general public, the business and agricultural community, and municipal or association officials on the necessity or protecting the water supply. This education can include many of the public participation activities and events described throughout this plan. Public participation activities and events include public hearings, city council meetings, county commission meetings, informational mailings, newspaper articles, public service announcements and school district activities.

- Pollution Prevention:

Pollution prevention is waste prevention and resource conservation. Preventing waste from being generated in the first place versus recycling an unused, over purchased waste material. The goals are to conserve natural resources and protect the quality of the land, the water, and the air. We must work toward reuse of items, using products with long lives, using natural resources efficiently and using processes that reduce consumption and waste.

The Advisory Board Coordinator will provide information to the county for distribution on pollution prevention practices relevant to homeowner, businesses and agriculture. A pollution prevention program will be most effective when the public is aware of recycling opportunities. The county will also distribute pollution prevention material provided by the advisory Board Coordinator or others to locations/sites listed on the inventory of potential sources of ground water contamination shown as an exhibit to the county Source Water Protection ordinance.

- Home*A*Syst:

The Home*A*Syst (H*A*S) project is designed to help homeowner become aware of conditions or practices on their property that increase the risk of drinking water contamination. H*A*S materials helps homeowners, farmers and ranchers assess homestead activities for their potential to contaminate groundwater. The project is coordinated by the Idaho Association of Soil Conservation Districts and is available at no cost. The Advisory Board Coordinator will make project materials available.

- Best Management Practices:

Best Management Practices (BMP's) applicable to many potential contaminant sources will either be distributed to businesses identified in the contaminant source inventory by the Advisory Board Coordinator and made available to them at the County Clerk's office. BMP's can be applicable to both point and non point sources of contamination. The Idaho Department of Environmental Quality will assist the Advisory Board Coordinator and the counties in locating appropriate BMP's or identify agencies or entities that can assist.

- Household Hazardous Waste Collection:

County officials will encourage development of a local household hazardous waste collection day and at a minimum will inform residents of household hazardous waste collection events with the county.

- Water Conservation:

Another non-regulatory management approach is to encourage potable water conservation. Water conservation can help in several ways:

1) Reduce the total quantity of water withdrawn from ground water aquifers thus slowing the movement of contaminants with the aquifer and allowing longer period of time for natural processes to degrade them;
2) Allow for a more efficient use of water within the county which will defer capital expenditures to increase the water system capacity;
3) Control over application of lawn, garden and crop irrigation water to limit leaching of agricultural chemical into the ground water;
4) Utilize canal water where feasible.

5.3 Water Quality Data Reviews:

Water quality data from city and county wells and any groundwater quality monitoring results in the

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3) Control over application of lawn, garden and crop irrigation water to limit leaching of agricultural chemical into the ground water;
4) Utilize canal water where feasible.

5.3 Water Quality Data Reviews:

Water quality data from city and county wells and any groundwater quality monitoring results in the

protection tiers. Tiers may be updated or modified if significant new information becomes available and if approved by the county commissioners.

9.0 Implementation:

The Source Water Protection Plan section of the Coordinated Water Resource Management plan shall be implemented upon adoption of a Drinking Water Protection Ordinance with exhibits by a member county. The Source Water Protection Plan portion of the Coordinated Water Resource Management plan will supersede any previous Drinking Water Protection Plan or plans which may have been previously adopted by the member counties.

9.1 Steps for adoption of Source Water Protection Ordinance by Counties:

1. Sample Source water ordinance is attached to this plan as exhibit A
2. Add source water protection area tiers to zoning ordinance.
3. Approve overlay to zoning map
4. Approve the inventory of potential sources of contamination and attach to source water ordinance as exhibit A.
5. Approve contingency plan and attach to the source water ordinance as exhibit B

9.2 Special Use Permits:

All special use permit applications that fall within the Source Water Protection area will be reviewed by the Source Water Protection Coordinator. The Source Water Protection Coordinator shall, within 15 days of receiving notification of an application for special use, send a letter of concerns and recommendations to the county planning and zoning commission for their review. Copies of the letter will also be sent to the county commissioners, city or drinking water association.

9.3 Plan for the Future:

To assure a safe water supply for a city, drinking water association and a county, the Advisory Board will implement the Source Water Protection Plan as a long-term protection strategy for the drinking water supply. The strategies outlined in this plan will be reviewed and updated as necessary to accommodate changes due to population growth, economic development or changes to land use.

10.0 Changes to the Plan:

Recommendations to amend this plan must be referred to or initiated by the Middle Snake Regional Water Resource Commission. The Commission will carefully review recommended changes and, if deemed necessary, will hold a public hearing. If, after the public hearing, the Commission adopts an amendment to the plan, the Commission will recommend adoption by each member county.

11.0 Exhibit A (Sample Ordinance):

The sample ordinance attached to this plan as exhibit A should be carefully scrutinized for the location and methodology of its own system of public water supply protection. It must be understood, however, that the doctrine of separate sovereignty applies in Idaho local government so counties have exclusive jurisdiction in unincorporated areas. Cities and counties have a constitutional authority and duty to take action to protect the public health and safety and since water recognizes no areas of jurisdiction there must be cooperation among entities to protect a public drinking water supply. Information about technical data supporting source water protection can be obtained from IDEQ regional offices.

PROPOSED AMENDMENTS

UPDATES

TO

ECONOMIC PORTION

OF THE

COORDINATED WATER RESOURCE MANAGEMENT PLAN

LAST REVISED IN 2013

MIDDLE SNAKE REGIONAL WATER RESOURCE COMMISSION ECONOMIC IMPACT OF WATER (Updated data for 2017)

LIMITING FACTORS

Before there can be any discussion of the economics of water within the region, several important limiting factors must be considered. The first of these is the Swan Falls Agreement of 1984. This agreement is between Idaho Power Company and the State of Idaho. The agreement states that between April 1 and October 31 of each year 3,900 cubic feet per second (cfs) of water must be available at Murphy's gage below the Swan Falls Dam. If there is insufficient water to meet this demand, the Idaho Department of Water Resources will curtail upstream water users. Most of the water to meet the demand for Swan Falls comes from spring flows with lessor amounts coming from feeder streams and canal returns flows below Milner Dam. Groundwater pampering has reduced spring flows and better management by canal companies has reduced canal return flows. If spring flows continue to decline, it will become more and more difficult to sustain the flows at Swan Falls.

Another factor is the Nez Perce Agreement of 2004. This agreement calls for the rental, by the Bureau of Reclamation, from the state's rental pool up to 427,000 acre feet of water from the upper Snake River Basin. The water is to be used for in-stream flow augmentation for the salmon recovery effort. There are also consequences under this agreement if water to Swan Falls is less than allowed by the Swan Falls Agreement.

A limiting factor may be global climate change. This is truly an X factor for the future of the region's water supply. Some scientists believe the earth is warming and there is still disagreement as to the cause. The cause of climate change for the region is perhaps less important than the impact which is unknown at the present time. County leaders should consider that the result may be, over time, less moisture to the regional water sheds. Water is, and will remain, a limiting factor to the region's primarily agricultural economy.

SITUATION STATEMENT – THE VALUE OF WATER

The economy of the counties making up this region evolved in much the same way as other regions of the state and similar to many western states. First the trappers arrived and then the immigrants whose destination was the Oregon Territory. Then the miners came following the discovery of gold along the Middle Snake River. Camps and settlements began to appear and permanent settlers began cultivating the land and raising livestock. A fledgling tourist industry also made its appearance in 1883.

Shortly after the beginning of the 20th century it became evident that agriculture would become the backbone of the regional economy and it remains so to this day. Harnessing the waters in the region made it so. Some small non-agricultural related industries have and are developing in the region, but their economic impact remains small. The region's larger industries are still agriculturally related and will, most likely remain so in the foreseeable future. Recreation and tourism is also developing. It is difficult, however, to place a dollar value on water related recreation and tourism within the region, but is believed to be significant. Water related activities within the region are many and varied. They include viewing of Shoshone Falls and the grandeur of the Snake River Canyon along with lessor canyons, watching participating in speed boat racing at the annual Burley Regatta, viewing and learning about fish production facilities, B.A.S.E jumping into the Snake River Canyon

and boating, fishing and hunting on the Snake River and area reservoirs. The region's water resources have created many recreational and tourism opportunities over the years. The Idaho Department of Labor, Research and Analysis estimates tourism creates about 3220 jobs within region IV representing 3.9% of the total region IV workforce in 2013. How many workers are directly tied to this region's water resources is impossible to gauge. A 2004 Idaho Department of Fish and Game study estimated anglers alone brought in about $12,451,000 to the regional economy. If the value of recreation and tourism could be accurately estimated, the amount could be added over and above the value created by agriculture since most would be directly related to water resources.

The counties desire that the public and all levels of government understand the region's economy and the impact of water on the continued health of that economy. There is a fear the expanding economy coupled with increasing job opportunities in the retail and service sectors have made people complacent. Many have forgotten how much this region's economy relies on an adequate supply of good quality water for agricultural production and processing. Every populated center is dependent upon one or more base industries and it is readily apparent that ours has only one at this time-agriculture. For this reason the County Commissioners asked the University of Idaho Extension, the College of Agricultural and Life Science and rural economists to prepare a model which examines the regional agricultural economy. This model is now used to produce a water resource impact statement based on the model for the economy of the counties covered in the Coordinated Water Resource Management Plan.

ECONOMIC IMPACT OF AGRICULTURE IN THE MAGIC VALLEY

The Magic Valley economy has evolved from a substantially rural community to one that has experienced consistent growth in the goods and services sectors. The economy has enjoyed a constant and steady growth over the past decade. There have been some changes in the sectors which provide the major impact within the economy. As strong and varied as the economy is, the major strength is the direct result of the jobs and new money generated by agricultural production and processing. ~~A state-wide economic model called Idaho Agriculture Economic Model Program (IDAEMP) that was developed by the University of Idaho's College of Agricultural and Life Sciences, Department of Agricultural and Rural Economics established the Magic Valley as the region in the state that is most dependent on natural resources.~~ A regionalized economic input/output model was developed to look more closely at the relationship of individual agricultural sectors and the overall economy of the six lower counties in the Magic Valley. Economic data for the model was updated in 2016 using 2012 and 2013 data.

In order to give a clear picture of the value of water to the agriculture economy, it is important to compare the value of agriculture to the economy of the Magic Valley, and the State of Idaho. In 2012 the lower six counties of the Magic Valley produced $3.5 billion dollars of agricultural products sold and had $682 million dollars of net income. In this same time period, the State of Idaho produced for sale $7.8 billion dollars (2012 USDA Census of Agriculture) of agricultural products. Forty-four percent of the agricultural

Products sold in Idaho in 2012 were generated by these counties (Table 1). Ninety-two percent of the agricultural land in this 6 county region is irrigated. Water is a major factor in the farm economy of the Magic Valley and Magic Valley agriculture is a major player in the farm economy of the State of Idaho.

TABLE 1. Per County Farm Product Value

Geographic Area	Value of Crops Sold	Value of Livestock and Livestock Products	Total Value of Ag products sold
Cassia	$257,600,000	$696,100,000	$953,700,000
Gooding	$101,000,000	$842,000,000	$943,000,000
Jerome	$145,200,000	$472,000,000	$617,200,000
Lincoln	$38,300,000	$137,300,000	$175,600,000
Minidoka	$268,000,000	$101,000,000	$369,000,000
Twin Falls	$216,000,000	$384,000,000	$600,000,000
Magic Valley Total	**$880,900,000**	**$2,632,400,000**	**$3,513,300,000**
State of Idaho Total	**$3,443,000,000**	**$4,358,400,000**	**$7,801,400,000**

2012 USDA-NASS Census of Agriculture

One concern frequently raised in the region is the impact of the potential loss of irrigation water. Before examining the result of a loss of water, it is beneficial to look at the industry as it currently exists. The agricultural industry in the Magic Valley is highly integrated throughout the entire economy. Along with the farms, dairies, ranches and aquaculture, there are important support businesses. Feed, seed, irrigation equipment, fertilizer and chemical suppliers, farm equipment and management services are the most obvious. Many jobs found in the public and private sectors of the economy are the direct result of the total agricultural economy. Producers of raw agricultural products, along with food processors, provide a large portion of the region's direct jobs and contribute to the region's property tax base. Agriculture utilizes natural resources. The Magic Valley has used the production from, and exportation of, natural resource based products to generate wealth for the region. The productive value of water is used to look at job creation. For every 28 irrigated acres there is one job created in the region, and for every 80 acres irrigated there is one direct production job created. To put it another way, 3.6 direct and indirect ag related jobs are created for every 80 acres of irrigated farm ground.

Production and Exportation

Table 2 provides a view of the Magic Valley crop and livestock production industries for 2013. It provides a picture of the value of the production and the relative size of each of the sectors within the agricultural economy.

Table 2. Value of Crop and Livestock Production and the Relative Importance of Each to Magic Valley

	Value of Production	% of Livestock Production	% of Crop Production	% of Ag Processing	% of Total**
Dairy Production	$ 1,883,000,000	71%			21%
Cattle Including Dairy	$ 685,000,000	26%			8%
Fish Farming	$ 38,000,000	1%			0%
Miscellaneous Livestock	$ 57,000,000	2%			1%
Hay	$ 402,000,000		34%		5%
Vegetables*	$ 300,000,000		25%		3%
Grain & Silage	$ 303,000,000		26%		3%
Sugar Beet Production	$ 160,000,000		14%		2%
Miscellaneous Crops	$ 13,000,000		1%		0%
Dairy Processing	$ 2,079,000,000			42%	24%
Livestock Feed***	$ 741,000,000			15%	8%
Potato Processing	$ 791,000,000			16%	9%
Sugar Processing	$ 938,000,000			19%	11%
Ethanol Production	$ 66,000,000			1%	1%
Livestock Processing	$ 217,000,000			4%	2%
Misc. Food Processing	$ 63,000,000			1%	1%
Fish Processing	$ 100,000,000			2%	1%

***Potato, bean and sweet corn production, ** Zeros indicate less than 1% of the total, not an actual zero value**

One major reason agricultural production has remained an important part of the region's economy is the physical location of commodity production relative to agricultural processing facilities. The ability to "add value" to raw agricultural products, through processing is of primary importance to the region's economy, and adding value increases the export potential of the raw products. Milk, sugar beets, potatoes, and feed lead the list of ag processing in the Magic Valley. Adding value to raw products boosts the local economy through increased exports, job creation and the profitability of investments. Since the majority of the processed products are exported, the outside money returned the region helps to fuel the local economy which then benefits the entire region. Farm and ranch inputs are purchased locally and the raised products are then sold to local processing facilities. In doing so, agricultural production is fully integrated into the regional economy.

Economic success can be measured by the ability to capture and hold outside resources. The export of processed agriculture products enhances that ability. Table 3 shows the percent of export contributed by raw agriculture products, ag processing, manufacturing and service sector of the economy.

Table 3. - The Percent of Exported Products for Sector Sources

Products	Percent of Total Exports
Raw Ag. Products	13%
Processed Ag Products	49%
Manufacturing. & Services	38%

Using the regional economic model, the impact of changes in agriculture can be evaluated. Table 4 shows the amount of employment directly and indirectly (2013) contributed by agricultural production and food processing in the regional economy. Direct employment jobs are those that are directly related to a specific segment of the economy. These are the workers on the farm or in the factory. The indirect jobs are those necessary to support the workers directly employed. For example the individual who works on a farm in the production of an agricultural commodity is a direct employee while some of the grocery clerks and waitresses at a restaurant who serve the needs of the direct employee are considered indirect jobs. Each sector of the economy has direct and indirect jobs associated with it.

Table 4. Number of Jobs in the Magic Valley Economy

Segments of the Economy	Direct Jobs	Indirect Jobs Created
Agriculture Production and Processing	8,600	36,800
Remaining. Segments of the Economy	23,600	26,100
Total Jobs (Direct + Indirect)	95,000	

Agricultural production and processing employees represent about 8,600 people who are directly employed in those sectors. The result of all the economic activity associated with the agricultural production and processing creates another 36,800 jobs. The end result is that 45,400 of the jobs in the Magic Valley are directly or indirectly related to agriculture. Identifying which sector is responsible for specific jobs in the region is a bit confusing, but of the total of 95,000 jobs in the region, 45,400 or 48% are a result of agriculture. The sustainability of a strong agricultural economy in the Magic Valley depends on a reliable water supply. Unlike what cities experience when a business closes, when an agricultural production unit is vacated by one producer it is operated by a new producer, usually in the next production cycle, rather than remaining idle. Regardless of the water source - surface or ground - the key is reliability of the source. Drought and water calls decrease reliability. Agricultural processors have been willing to invest in our area due to the reliability of water. The location of agricultural processing in the Magic Valley is directly dependent upon our ability to provide a dependable supply of agricultural commodities. The sustainability of the relationship between processors, producers and the entire agricultural economy is dependent on the reliability and availability of quality water.

Farmers and ranchers, as well as investors, view land in two ways: 1) for the productive value of the land, and, 2) for the investment potential of the land. The land value is based on both its ability to produce and its value as an investment. The value of the land is greatly dependent on the reliability of the water resources that accompany the land. In the Magic Valley, the reliability of the irrigation water supply is the largest single factor affecting land value.

An example is the land served by the Gooding-Milner Canal, which provides water from the Snake River and is bordered by land that is served solely by the Big Wood Canal, which provides water out of Magic Reservoir on the Big Wood River. These neighboring sites have the same production potential, yet the difference in land value is substantial. The difference in land value is reliability of the water source.

The importance of agricultural production to the economy of the Magic Valley has been documented. The sustainability of that production is key to the continued viability of the entire economy. A change in agricultural production and processing would be expected to have an effect on every sector of the economy. Using the regional economic model to evaluate the effect of a lowered quantity of available water would suggest that economically it would be beneficial to

increase application efficiency. The technology to increase application efficiency does exist, but at a cost. The cost to increase efficiency must be purchased with profits and government incentive programs. Thus, producers will have to redirect profits from traditional uses to investment in more efficient irrigation. The other option is to not increase efficiency but to reduce production. The exact effect of reducing production would depend on which crops were no longer produced. Those with ties to local processors in the magic Valley would have greater local impact.

When water is in short supply, farmers have made huge investments in more efficient sprinklers and many change crop rotations to those requiring less water. Farmers have also improved efficiency by changing application rates, pressure adjustments, scheduling and idling marginal ground. Evaluating production during the last drought, it is hard to find that the value of farm production has suffered, but it came at a huge expense. Farmers and canal companies have done much to insulate the community from the economics of drought by investing in technology. Only history will tell whether it is sustainable ecologically and economically.

The cost ~~long term value~~ of water in the Magic Valley is typically determined by ~~the cost of an~~ what a typical buyer would pay for an irrigated acre of land compared to what a buyer would pay for a ~~the cost of an acre of dry ground~~ dry acre. ~~Dry land typically sells for $200.00 to $300.00 per acre in the Valley.~~ The cost of irrigated land is also dependent on location, soil and dependability of the water supply. As an example, if a typical buyer of dry land is willing to pay $500.00 per acre and another buyer will pay $4,000.00 for an irrigated acre the cost ~~long term value~~ of water is $3,500.00 per acre. ~~if the value of an irrigated acre is $3,500.00, the actual cost of water would be between $3,200.00 and $3,300.00~~. Another way to find the value of water is ~~by determining the productive value of water,~~ based on the value of production and finding what an individual will pay for a certain annual stream of production. The production value of water is, therefore, the annual crop production from a flow of water. The annual productive value is determined by the amount of water it takes to produce a certain crop with a known value. Productive value of water, shown in Table 5, is estimated based on known water diversions and the approximate value of all crops grown. The productive value of water averages $170.00 per acre foot. On average it takes the application of about 2 ½ acre feet of water to properly irrigate one acre so the value of 2 ½ acre feet of water based on the value of one acre foot averages $425.00. This value, however, does not consider diverted water lost by the canal system to the aquifer or evaporation which together can be 30% or more. Arguably this loss, if known, would inflate the productive value of water actually received at the farm. Ground water pumpers have an advantage in this regard since little is lost. It is important to note that groundwater pumping accounts for roughly one half of the irrigation water used in the Magic Valley and the data in Table 5, shown on the next page, only represents the surface diversions.

Table 5. Typical Productive Value of Surface-diverted Water

County	Water District	Acres Served	Normal Diversions Acre Feet	Average Crop Value -$ Per/Acre	Total Value of Crops for Served Acres	Productive Value per Acre Foot of Water(A)
Gooding-Jerome	North Side	160,000	1,000,000	$843*	$134,880,000	$135
Lincoln	Gooding-Milner	62,420	454,000	$626**	$39,074,920	$86
	Big Wood	36,542	250,000	$540	$19,732,680	$79
Twin Falls	Twin Falls	202,690	1,060,000	$844	$171,070,000	$161
	Salmon Falls	20,500	65,500	$626	$12,833,000	$196 (B)
Cassia	BID	47,812	240,600	$1,082	$51,732,584	$215
Minidoka	MID	77,254	315,000	$1,307	$100,970,000	$320

A. It takes an average of 2.5 acre feet to properly irrigate one acre. Productive value per acre = Value per acre foot X 2.5

B. Salmon Tract crop mix more closely approximates Lincoln County rather than crops grown on the Twin Falls Tract.. Supplemental ground water may possibly skew the value of Salmon Tract water upward as well.

*Average of Jerome and Gooding County

** Average of Lincoln and Gooding County

Normal diversions in acre feet is based from conversations with canal company managers on what they typically have diverted in previous years. Historically some canals have diverted more than this amount when they were running water in the winter for stock water. Because of improvements in canal delivery efficiency and user efficiency most canal companies are diverting less per acre than they did when the systems were first fully operational. Some of the improvements in efficiency are due to canal management and sealing of major leaks. In the past 10 years, advancements in flow monitoring have allowed managers to improve efficiency in all parts of the delivery system. Individual year diversion is as much a function of weather, which affects the length of growing season, as is water availability and diversion rights. Water diverted for irrigation is determined by more than what is simply in storage or in natural flow. In addition to total amount available, managers have to determine dates to start and stop irrigation along with average flow per day during differing parts of the irrigation season. Even if supplies were adequate, diversion could be below average during a wet spring or fall.

For every acre foot of water not available, it is estimated that an average of $170.00 in production sales value is lost. It is interesting to note however, the last period of drought and restricted diversions did not result in a corresponding loss of production. This occurred because of investments in irrigation efficiency, changes to crop rotations the continued stability of ground water pumping and high crop and livestock prices. It is critical to understand that without groundwater the valley's economy would be affected more significantly during drought.

One of the strengths of Idaho's Water Management System has been the availability of water bank resources. The water bank is a storage reserve of committed, but generally not completely used, water that has been available to agricultural production in short water years. In previous low water years this reserve was completely allocated. The water demand for salmon recovery, and periods of

drought has made the water bank very important and ~~has~~ caused the value of the leased water to increase.

The average value of crops produced per acre and the number of acres it would take to raise $1 million dollars of that crop is shown in Table 6. The number of head of various livestock enterprises that would produce $1 million of product is also included. The aquaculture industry is a bit of an anomaly in that it is a non-consumptive use of the water diverted. An acre foot of water generates $26 worth of value in aquaculture. As the water is returned back to the river, it can be used again for recreation, hydropower, and crop and livestock production further downstream. The non-consumptive nature of the industry makes developing a per-acre-foot value difficult because the water has value not only for aquaculture, but all other downstream uses.

Table 6. Production Units Required to Generate $1,000,000

Crop	**Value of Production/Acre**	**Acres required to generate $1 million in production**
Small Grains	$775	1290
Potato	$3627	276
Sugar Beets	$1400	714
Comm. Beans	$465	2150
Alfalfa	$1020	980
Corn Silage	$1064	940
Livestock	**Value per Production/Head**	**Head required to generate $1 million in sales**
Beef (Cow-calf)	$1400	714
Feedlot (1250lb)	$1812	552
Dairy (milk only)	$1350	740
Fish (food size/l lb.) *	$1.24	806,450

*** Based on 2013 Idaho Agriculture Statistics**

Historically, water calls have caused a flurry of activity in eastern and south-central Idaho. A report to the Middle Snake Regional Water Resource Commission by University of Idaho Extension Educators, showed the huge loss to the region's economy should a cutoff to groundwater pumping occur. The impact of water curtailment in ~~south~~east and south central Idaho to junior pumpers and others led to the creation of the Comprehensive Aquifer Management Planning Group (CAMP). This group worked for several years to create a ~~comprehensive~~ aquifer management plan ~~which~~ for the entire Eastern Snake Plain Aquifer (ESPA) that was adopted by the legislature in 2008. A permanent funding source, however, has not been identified so funding to carry out the plan is currently at the annual discretion of the legislature.

Water calls ~~are continuing to be made and this situation is far from over~~ continued for several years after the ESPA Management Plan was approved until an agreement was reached between ground water pumpers and a surface water coalition in 2015. ~~IDWR response has been highly correlated to the operation of the Groundwater Model developed specifically for this purpose. Whether the model, and how it is used, will keep up with the changing demand for water and the adherence to the prior appropriation doctrine will be one for the history books.~~ The agreement includes language to meet the requirements of the Swan Falls Agreement and over the long term, calls for ~~an 11%~~ a reduction in pumping on the ESPA by 240,000 acre feet, delivery by pumpers of

50,000 acre-feet of storage water and the installation of measuring devices at well heads. The agreement also seeks state sponsored recharge efforts of 250,000 acre-feet annually.

~~Land valuation will be an indirect effect of water pumping curtailment. With land values directly tied to water availability, reliability, and delivery cost, the result of water curtailment would be a general lowering of land values, at least for a while, and would have an effect on county tax structure. Farmland property taxes are tied to the productivity of farmland, and any action that lowers profit potential lowers assessed value~~ Pumpers could be further curtailed by the Director of the Idaho Department of Water Resources (IDWR) if the terms of the Surface Water Coalition Agreement are not met or if it is not sufficient under its new ground water management program. In 2016 IDWR adopted an Eastern Snake Plain Aquifer Ground Water Management Area which gives the Director the ability to do what is necessary to stabilize the aquifer. If the management area survives challenges, it would also include the aquifer's tributary basins. IDWR will also monitor the impact of these events and their impact on stabilizing the ESPA.

~~1. The Role of Natural Resource-based Industries in Idaho's Economy," University of Idaho Cooperative Extension System Bulletin 73-I.~~

~~2. Value added is the measure of the economic contribution of different regional industries. It is the sum of employee compensation, proprietary income, indirect business taxes and other property income. At the local level it is the equivalent of Gross National Product.~~

Definitions:

- Cost of water: The price paid to acquire the right to use and the delivery of water.
- Diverted water: Water received through a diversion structure from its natural source. Typical water structures include pumps, headgates, ditches, pipeline and dams or any combination.
- Delivered water: Surface or ground water received at the point of use.
- Ground water: Ground water is water that is located beneath the ground surface in soil pore spaces and the fractures of lithologic formations.
- Surface water: Water collecting on the ground or in a stream, river, lake, wetland, or ocean. Surface water is naturally replenished by precipitation and naturally lost through discharge to evaporation and subsurface seepage into ground water.
- Water Bank: The Water Bank, also known as the Idaho Water Supply Bank, is essentially a water exchange market operated by the Idaho Water Resource Board to assist in marketing the water right of natural flow and water stored in Idaho reservoirs. It is a mechanism by which water rights that are not being used can be made available for use by others through the lease and rental process.
- Input/Output model: An economic model that studies the interdependency of various sectors of the national or regional economy.
- Direct employment/job: When studying a regional economy based on exports or sales outside of the region, these are jobs that are directly attributed to a specific exporting sector in the economy. For example, the employees in a potato processing facility would represent the direct employment of the potato processing sector.
- Indirect employment/job: When studying a regional economy based on exports or sales outside the region, these are jobs that are not directly attributable to a specific exporting sector in the economy. For example, when the employees of the potato processing facility spend their money in a restaurant in the region the restaurant jobs are indirectly linked to the potato processing facility.
- Value added: The sum of (1) wages and salaries, (2) proprietor's income, (3) indirect business taxes, and (4) dividends, interest, and rents. Value added is more than simply buying raw commodity, making some product, and selling it for more money.
- Value of Water: Equivalent worth or return from the initial cost of water.
- Water call: A water delivery call made by the holder of a senior right to the use of water. A water call is made by a senior right holder when the holder is not receiving its total allocation.
- Region: Defined by the economic portion of the coordinated Water Resource Management Plan to include the counties of Cassia, Gooding, Jerome, Lincoln, Minidoka and Twin Falls.