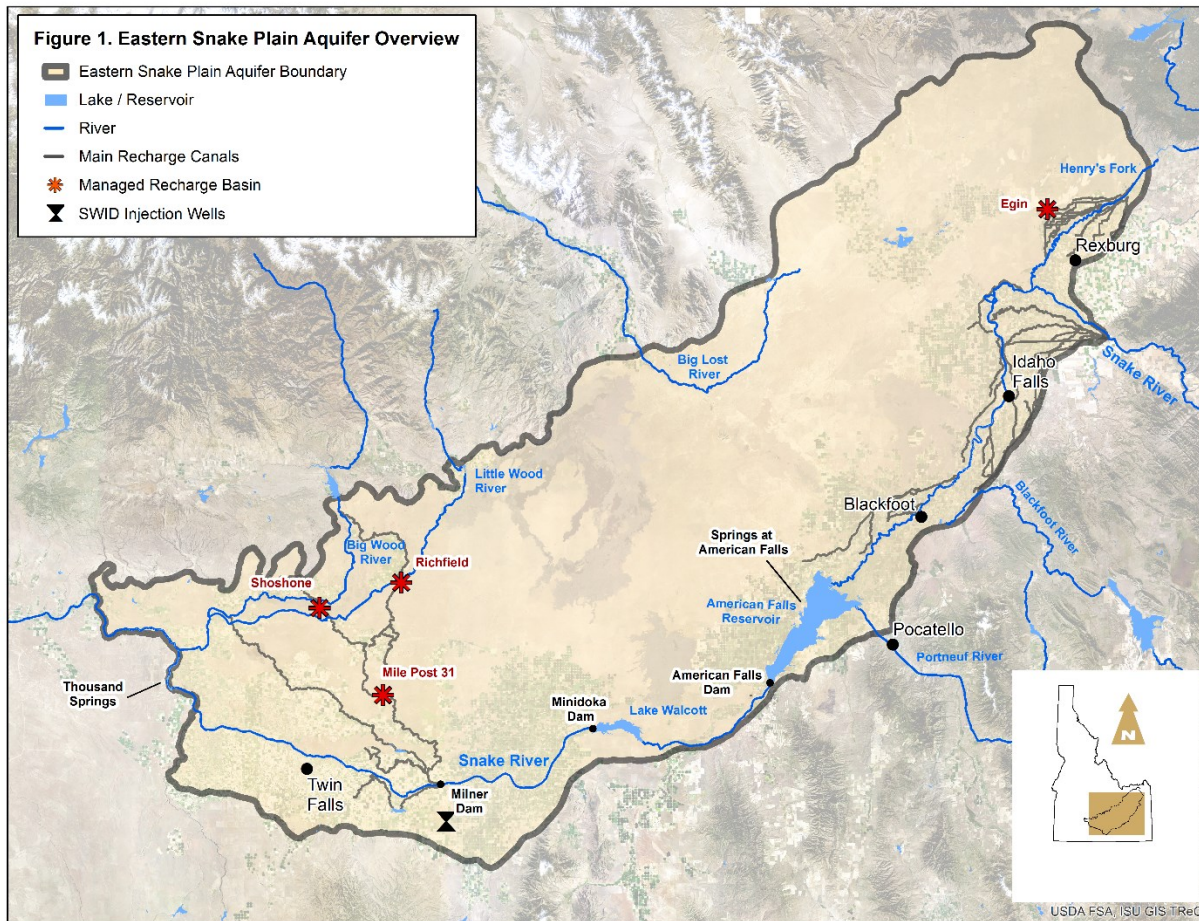


IGWA Bulletin

AQUIFER RECHARGE OF THE EASTERN SNAKE PLAIN AQUIFER



The Eastern Snake Plain Aquifer (ESPA) underlying the Eastern Snake Plain is one of the world's largest and most productive aquifers. The ESPA covers 10,800 square miles of semi-arid plains surrounded by mountains. The aquifer and river have been critical to the economic development of the area and the transformation of the Eastern Snake Plain from semi-arid plains into the breadbasket of Idaho.

The ESPA and the Snake River are intricately linked. The majority of surface water in the area originates as snowfall from high elevation mountains surrounding the Eastern Snake Plain. Historically the streams surrounding the Eastern Snake Plain and some areas of the Snake River naturally added water to the ESPA (see Figure 1).

continued on page 15



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MEMBERS' CORNER

Pump Installers' Licensure: The IGWA board has decided to move forward in trying to create a limited specialty pump installers license. IGWA President Legrand Baker and Executive Director Lynn Tominaga are working together with the Idaho Division of Building Safety's Plumbing and Electrical Divisions to determine whether it is possible to create a tiered system and/or combine the plumbing and electrical license into one for pump installers. Testing remains a major concern for board members and the membership at large. IGWA supports developing a test that is based on the practical knowledge and experience necessary in the field.

IDWR Domestic Well Permit Fee Increase: IDWR is considering a proposal to increase domestic well permit fees. The fee increase would replace general fund monies that previously have been used to fund the program. The IGWA board is in the process of reviewing the proposed legislation and has yet to decide whether it will support the fee increase.

Amending the Geothermal Statute: IGWA is evaluating the possibility of introducing legislation to amend Idaho Code 42-233 to raise the temperature restrictions for drilling a geothermal well. At present the temperature restriction is 85 degrees and above. The board and members must reach some level of consensus before IGWA will move forward to discuss the issue IDWR and/or develop legislation.

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To access other Tool Box Talks from this campaign visit OSHA's website at the link below,

https://www.osha.gov/dte/outreach/construction/focus_four/index.html

OSHA'S 2018 FOCUS 4 CAMPAIGN

How to Conduct an Effective Tool-Box Talk

Carrying out the training

Like all training, delivering the information effectively takes preparation and a desire to involve the workers in health and safety at the workplace. Employers may train workers to lead the training or have supervisors provide the training. Studies have shown peer-to-peer training is effective, participatory and well-retained.

Preparing to teach the training sessions:

1. Spend about 15 minutes to become familiar with the Toolbox Talk.
2. Print a copy of a relevant Toolbox Talk and think about how the topic relates to your specific worksite.

Advice for trainers

Safety meetings work best if the whole crew actively participates. This makes it more interesting and more likely that people will remember the information you've given them.

Here are some ways to encourage everyone to get involved:

- ⇒ Ask questions instead of simply giving them the information. After you ask a question, wait a short time to let people think. Then, call on volunteers to answer.
- ⇒ Ask about personal experience. This can help the group see how the topic is relevant to them. You could ask: Has anyone here had personal experience in dealing with this hazard? What happened?
- ⇒ _Make sure everyone has a chance to talk. If a crew member is talking too much, invite someone else to speak.
- ⇒ _Don't fake it. If you don't know the answer to a question, don't guess. Write the question down and promise to get back to them.
- ⇒ Stick to the topic. If the crew's questions and comments move too far from the topic, tell them that their concerns can be addressed later, either privately or in a future safety meeting.



TOOLBOX TALKS

Electrical Safety—Toolbox Talk # 1

Precautions for avoiding electrical shocks include, but not limited to the following:

General safety precautions:

Safety to personnel and safe operation of machines and tools should be of utmost importance in all considerations of using electricity on the jobsite. Electrical hazards are among the most frequently cited OSHA violations. There are many specific standards that address electrical safety. Refer to Subpart K—Electrical (1926.400-449) for more information.

Ground Fault Circuit Interrupters:

The *GFCI* is a fast acting device that senses a small current leakage to ground. Within 1/40 of a second it shuts off the electricity and "interrupts" the current flow. It provides effective protection against shocks and electrocution. OSHA requires GCFIs or an assured equipment grounding conductor program on all construction sites and projects.

Extension Cords:

Extension cords are convenient ways to provide power to portable equipment. However, they are often misused, resulting in injuries and possible shock hazards. It is important thing to remember that extension cords are for temporary use only. Inspect extension cords for physical damage before use; check rating on the tool being used with an extension cord; do not use an extension cord that has a lower rating; do not plug one extension cord into another.

Electrical Fires:

On construction sites, an electrical fire that may occur when portable tools overload a power source. If possible to do safely, immediately disconnect the tool or power cord from the power source. This usually results in the electrical fire being extinguished. If the electrical fire has not been extinguished, a trained employee can use a Class "C" or multi-purpose fire extinguisher to PASS over the fire.

PASS – Pull Aim, Spray and Sweep

This information has been developed by OSHA and its partners with the intent to assist employers, workers, and others as they strive to improve workplace health and safety. This information must be understood as a tool for addressing workplace hazards, rather than an exhaustive statement of an employer's legal obligations, which are defined by statute, regulations, and standards.

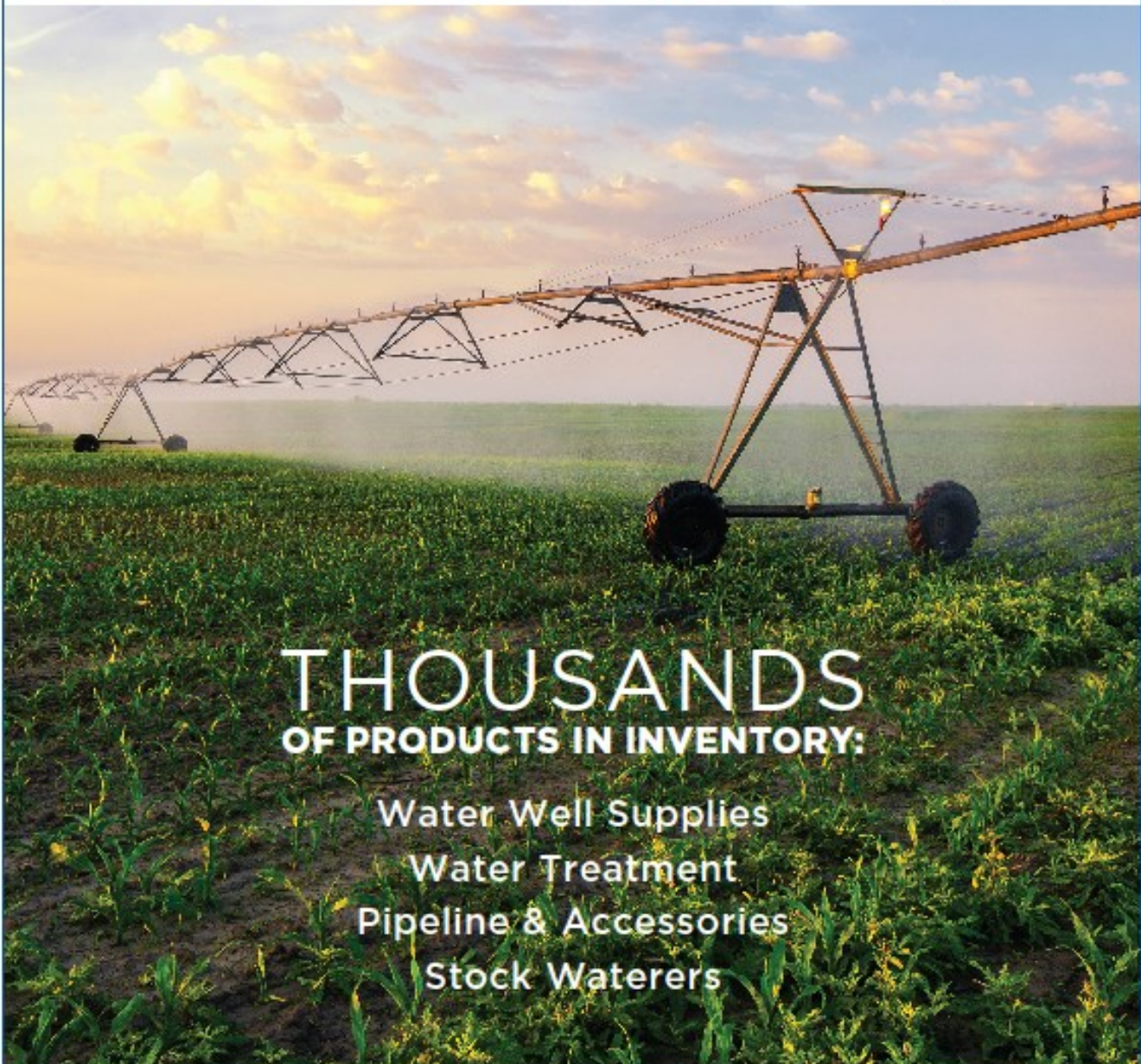




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Audit of oil and gas royalties on State of Idaho leases released

August 21, 2018 (BOISE) – An audit released Tuesday examines oil and gas royalties paid to the State of Idaho on three wells under State of Idaho leases.

The Idaho Department of Lands (IDL) asked for the audit to determine whether royalties paid to the State of Idaho for oil and gas produced under State leases complied with Idaho law and IDL lease agreements.

Texas-based energy consulting firm Opportune LLP secured the IDL contract in 2017 to conduct the audit, and presented its findings at the State Board of Land Commissioners (Land Board) meeting in Boise today.

The audit is available at this link: https://www.idl.idaho.gov/oil-gas/leasing/audit_9-082118-oil-gas-royalty-audit-v0816.pdf

The IDL informational memo to the Land Board on the audit's findings and the agency's planned actions is available here: https://www.idl.idaho.gov/oil-gas/leasing/lb-memo_9-082118-oil-gas-royalty-audit-v0816.pdf

The graphic features a blue header with the "groundwater week" logo in white, with "Exhibits • Workshops • Summit" in smaller text below it, and "Las Vegas, Nevada • December 3-6, 2018" at the bottom. Below the header are three vertical panels: "Exhibits" with a photo of a truck and people, "Workshops" with a photo of a group in a meeting, and "Summit" with a photo of a person pointing at a whiteboard. A blue footer contains the text "Learn more and register at GroundwaterWeek.com."

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Learn Online with Free Course on Grouting Methods for Water Supply Wells

NGWA is offering a free online, self-paced course covering the basics of sealing and grouting. It is critical that a water supply well be designed so it is protected from anything that can pollute it—and a successful seal starts before the first turn of the drilling bit.

Topics included in the course are:

- Annular sealing
- Pre-planning and design
- Sealant materials and their properties
- Placement methods.

Register at www.NGWA.org/Events-Education. The online course is made possible by a grant from Franklin Electric.

Videos Promote Groundwater Fields of Study, Careers

NGWA created two videos spotlighting groundwater fields of study and careers to students. A two-minute video called “Groundwater is Cool” primarily targets secondary school students. The video highlights the critical importance of groundwater as a freshwater resource for human use and the environment. It contains arresting statistics, fast-paced graphics, and music.

A five-minute video explores the benefits of groundwater careers in interviews with students, professors, and professionals including NGWA Board Director Merritt Partridge, CVCLD, vice president of Partridge Well Drilling Co. Inc. in Jacksonville, Florida.

In his remarks, Partridge addresses the satisfaction of providing water to people and why that is important.

“Providing groundwater to people who need it is one of the greatest careers a person could have. When I install a new well, I know I’ve done something good for someone,” Partridge says. “There are many places in the world where you just can’t live without groundwater. When I drill a water well, I’m providing a lifeline to someone who needs it.” Partridge also talked about the diverse skills required in well construction.

“I’m a water well system professional and proud of it. I have to be a builder, an engineer, an inventor, and a problem solver. What could be more challenging and satisfying than that?” he says.

NGWA encourages all water well construction professionals to link to the videos from their websites and social media and share with high schools and colleges in their areas. Access both videos on NGWA’s Career Center webpage at www.NGWA.org/CareerCenter.



COMMUNITY MILESTONES

IGWA announces CEC and Board meeting:

September 20, 2018

Connors Café Burley, Idaho

CEC meets at 10 a.m. to Noon

Board meeting Noon to 4 p.m.

IGWA's first regional CEC workshop is scheduled for **NOVEMBER 16, 2018** in Coeur d'Alene.

We would like to recognize and thank our CEC Regional Workshop Sponsors for 2018-2019. With the help of these six sponsors IGWA is able to bring cost effective continuing education closer to home for our members in northern and eastern Idaho.

Please join us in thanking our 2018-2019 Regional Workshop Sponsors

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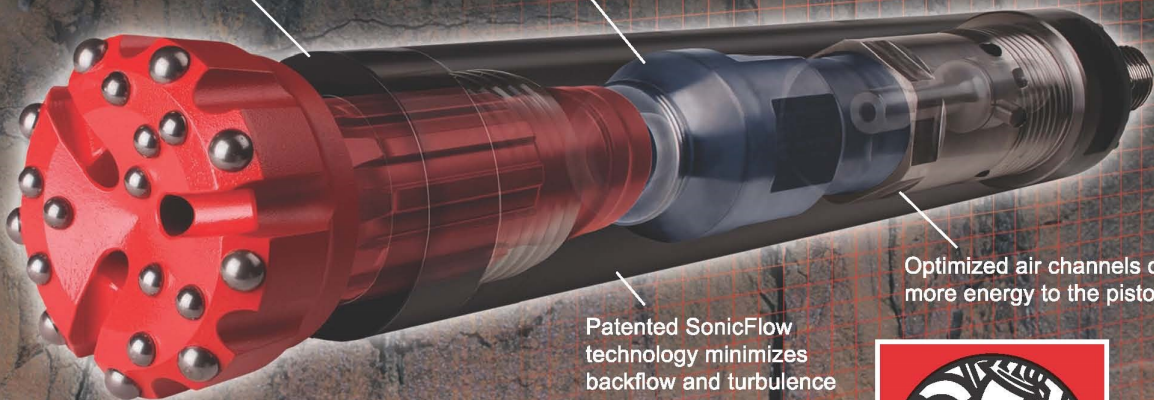
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EASTERN SNAKE PLAIN AQUIFER SEES LARGEST ANNUAL INCREASE IN WATER VOLUME IN MORE THAN 80 YEARS

NEWS RELEASE - FOR IMMEDIATE RELEASE JEROME, Idaho - (July 13, 2018) – The Eastern Snake Plain Aquifer (ESPA) experienced the single largest increase in water volume in more than 80 years – 1.7 million acre-feet – as a result of the Idaho Water Resource Board’s managed aquifer recharge program, farmers reducing water use, private aquifer-recharge efforts, increased tributary flows, and natural seepage from two back-to-back robust winter runoff years.

Mike McVay, a professional engineer and hydrogeologist for the Idaho Department of Water Resources, said the ESPA volume increase was calculated from the measurement of more than 350 wells across the ESPA region. It reflects the board’s steadily expanding aquifer-recharge program, which sent 545,000 acre-feet of water into the ESPA in the winter of 2017-18, and more than 317,000 acre-feet of water into the ESPA in the winter of 2016-17. The board’s goal is to recharge an average of 250,000 acre-feet per year.

The increase also reflects an historic 2015 water settlement forged by farmers in the ESPA region who irrigate with surface water and ground water, and two winters in a row with “exceptional precipitation,” officials said.

“We’ve had a significant uptick,” McVay said. “But we have to remember that this is a long-term proposition, and this is a good start. We need to build the aquifer back to sustainable levels over time.”

Before the winter of 2017, the Water Resource Board estimated that the aquifer was being over-drafted by about 200,000 acre-feet per year. Water from the ESPA drives the economy in eastern Idaho and south-central Idaho’s Magic Valley, serving agriculture, industry, manufacturing plants, municipal uses and drinking water for more than 400,000 residents.

Farmers participating in the 2015 water settlement should be commended for their part in stopping the aquifer decline, said Mat Weaver, deputy director of IDWR. “The reductions and private recharge that have occurred as a result of the settlement agreement have been hugely impactful,” he said.

“I’m pleased to see these results – I know that wet years help a lot, but we’re obviously getting a good return on our investment from the recharge program,” said Representative Lance Clow of Twin Falls. “I’m hoping that we can continue to do large amounts of recharge this coming winter. I think we need to keep expanding our infrastructure for recharge.”

Dean Stevenson, chairman of the Magic Valley Ground Water District, a participant in the 2015 water settlement agreement, said it was good to see positive results on ESPA water levels. “We have to remember that really we’re just getting started with the recharge program and the water settlement implementation. The long-term trend is what matters. We have to stay the course,” Stevenson said.

Board officials cautioned that in drought years less than 200,000 acre-feet of recharge will be possible under the best-case scenario, so it’s critical to take full advantage of opportunities to compensate for dry years. The Water Resource Board is considering more aquifer-recharge sites to increase recharge capacity in the Upper Snake River Valley and the Magic Valley.

Contact: Brian Patton, Chief, Planning Bureau, Idaho Water Resource Board, 208-287-4800 J

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Hands

My wife and I have the opportunity to sing at various settings. One of these meetings was a funeral for a distinguished older gentleman that had passed away. The family asked us if we would sing a song called “Daddy’s Hands”. I wanted to share with you a portion of that song:

*“I remember Daddy's hands workin' 'til they bled, Sacrificed unselfishly just to keep us all fed
If I could do things over, I'd live my life again, And never take for granted the love in Daddy's hands. Daddy's hands were soft and kind when I was cryin', Daddy's hands were hard as steel when I'd done wrong. Daddy's hands weren't always gentle but I've come to understand, There was always love in Daddy's hands.”*

Now I, like all of you, have done many things with my hands. That sentence itself seems like an understatement. We have held our sweetheart’s hand, and picked up our child or grandchildren. The fact is that we need these two, ten digit things at the end of our arms.

All of this might sound a little corny, and maybe a little stupid. But, we need to take care of these gifts that we have been given. Speaking as someone who has put his hand in the mud-box as the bailer was being lifted, we need to be a little more careful.

They make things to protect our hands. Gloves are a tool in your toolbox, use them. Let me ask you a question: Have you ever been working, doing everything right and then, Wham! Something came and smashed your hand? Do you remember removing your glove, praying that the fingers were still attached? And when they were, thinking of just how bad it could have been if you had not been wearing the glove?

I think that we all have been in that situation a time or two. Have you ever been feeling the cable trying to determine what was happening at the bottom of a hole, when a strand of the cable sliced your hand?

I want you to “think safety” as you work or send your employees out to do a job. Gloves are part of the arsenal we have to get everyone back in one piece. Gloves are an expendable item. You can write them off. You can do your part to make sure that you and your employees make it home, intact, and able to enjoy picking up a child to have them sit on your lap. At the very least, it makes it easier to pick your nose. ~ Mike

Mike Lewis, a certified EMT for over 25 years, grew up on a dairy farm in southern Idaho and traveled the world before returning to Idaho where he farms with his family



NEWS FEATURE

New Certificate Program Addresses Ways to Improve Safety in Workplace

NGWA has created its first online certificate program, Safe Practice in the Groundwater Industry: An NGWA Certificate Program. This NGWA online, on-demand certificate program addresses ways to improve safety in the workplace.

Historically there are three major loss areas in the groundwater industry:

- Materials handling
- Slips, trips, and falls
- Electrocutation/electrical hazards.

This course is taught by industry veterans Denis Crayon, CHST, and Roger E. Renner, MGWC, NGWAF. It addresses these three specific areas with the intent to:

- Inform employees of the hazards
- Increase awareness of the hazards
- Provide guidance on immediate actions to mitigate threats to safety.

When enrollees have completed all lessons, they take a 25-question test. The entire process, including the test, takes approximately three hours. Those who pass the test can then download their certificate.

To learn more about the certificate program, visit www.NGWA.org/Events-Education.



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AQUIFER RECHARGE *continued from page 1*

The aquifer returns a significant amount of water back to the Snake River through spring discharge. As the area was developed in the early 20th century, the aquifer was augmented with seepage from unlined canals and irrigated farm fields (incidental recharge). This resulted in an increase in aquifer water levels and spring flows to the Snake River.

Aquifer conditions started to change in the early to mid-1950's with increased demand on the aquifer as well as changes in irrigation practices that reduced recharge to the aquifer. The use of groundwater increased as a result of new pumping technology and economical energy prices. The early 1950's saw the development of turbine pumps making it feasible for many farmers previously using surface water to switch to groundwater. This also facilitated development of new irrigated land in areas previously unreachable by canals. During this time, improved irrigation and water delivery efficiency as well as the termination of winter canal flows resulted in a reduction in water recharged to the aquifer. Numerous canals delivering water from the Snake River were lined to reduce leakage and improve water delivery efficiency. Irrigation practices changed with the introduction of more water efficient sprinkler irrigation using center pivots rather than traditional flood irrigation techniques. A series of droughts also contributed to the increased use of groundwater and reduction in recharge from annual precipitation.

The combination of these factors resulted in a steady decline in the volume of water in the ESPA of approximately 200,000 acre-feet per year on average. The reduction in both the water table elevation and the volume of water within the ESPA had a direct impact on the flows at Thousand Springs and return flow to the Snake River. Reduced aquifer levels affected senior surface water right holders who relied upon these discharges to serve fish hatcheries along the Snake River, supply irrigators across the Eastern Snake Plain, and maintain critical minimum stream flows on the Snake River downstream of the ESPA.

The State of Idaho and water users recognized that it was necessary to recharge the ESPA and secure a long-term funding source to implement a "full-scale" managed recharge program. In 2015, the State legislature allocated approximately \$5 million for aquifer stabilization projects state-wide with a focus on ESPA managed recharge. Additional annual funding was secured for operation of the Idaho Water Resource Board (IWRB) Managed Recharge Program when the legislature authorized use of an additional \$5 million from the state's General Fund. At that time, the Legislature also directed the IWRB to expand the program to achieve an annual average of 250,000 acre-feet of managed recharge to the ESPA by December 31, 2024.

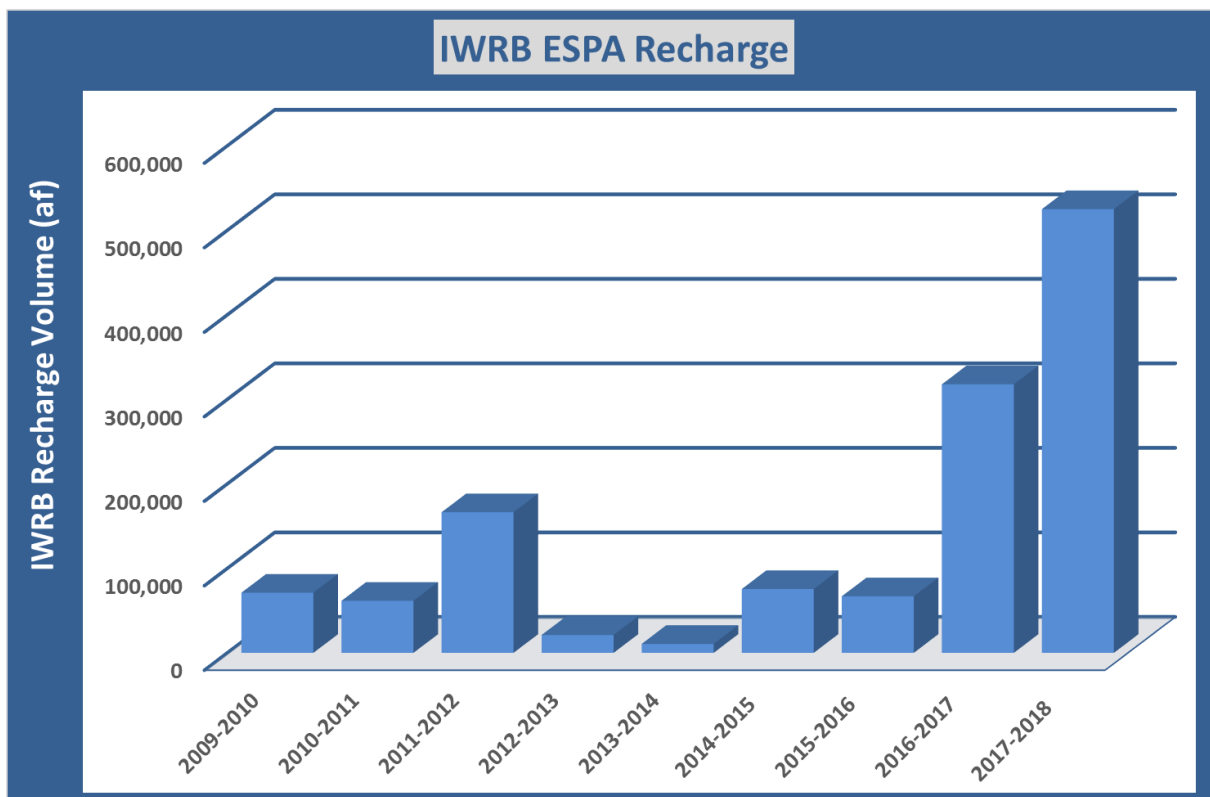
The IWRB currently accomplishes managed recharge through existing unlined canals, off-canal spreading basins, and injection wells. Managed recharge occurring in existing canals must be delivered during the non-irrigation season. However, water may be delivered to a spreading basin whenever the IWRB's water right is in priority and the connecting canal has the capacity to deliver water. In the ESPA, off-canal recharge sites are typically constructed in areas with pre-existing depressions that are used as infiltration ponds. The primary limitations of the basins are the carrying capacity of the canals and infiltration capacity of the basin, which is a function of the hydraulic head, soil type, and underlying geology. Currently in the ESPA, only one irrigation district (Southwest Irrigation District) operates injection wells for managed recharge. The IWRB partners with this district to deliver managed recharge under the IWRB's water right when possible.

continued on page 16

AQUIFER RECHARGE *continued from page 15*

To increase the length of the recharge season, the IWRB executed long-term contracts with canal companies to recharge water under the IWRB’s recharge water rights during the winter months. Funding dedicated to the IWRB program has been used to increase the capacity of the off-canal sites and to complete infrastructure improvements to allow canals to operate and deliver managed recharge water during freezing conditions in the winter. The IWRB has also partnered with individual canals on a number of projects that benefit both parties. In these cases, the canal companies enter into a long-term commitment to deliver managed recharge water for the IWRB in exchange for improvements that benefit the canal system year-round. These partnerships have proven to be an efficient way to expand the recharge program while leveraging existing infrastructure. Since 2013, the IWRB has invested over \$14 million dollars in investigations and infrastructure improvements to increase managed recharge capacity. It is estimated that over \$40 million dollars will be spent by 2024 to reach full build-out of the program.

Since 2009, the IWRB has steadily increased available capacity to perform managed recharge. Between 2009 and 2012 the ESPA region experienced a period of wet years with a significant amount of water in the system. During these wet years, the IWRB conducted managed recharge during the “shoulders” of the irrigation season. In the 2011-2012 recharge season over 166,000 acre-feet was recharged. The period between 2012 and 2016 was a relatively dry period with limited volumes of water available for managed recharge.



continued on page 17

AQUIFER RECHARGE *continued from page 16*

During the past two recharge seasons (2016-2017 and 2017-2018); there has been a tremendous volume of water available for managed recharge. Managed recharge was conducted for 250 days during the 2016-2017 recharge season and the IWRB has been able to perform managed recharge for over 298 days so far during the 2017-2018 season. Since 2014, when significant funding was appropriated for the program, IWRB has recharged over 975,000 acre-feet of water with the majority occurring during the past two years. As new off-site recharge facilities have been constructed, IWRB's recharge potential has dramatically increased. The average rate of recharge for the 2014-2015 recharge season was 211 cfs. This has steadily increased to an average of over 1,000 cfs for the current recharge season. The increase in the average recharge rate is directly related to the infrastructure improvements the IWRB has funded and the partnerships that have been developed with all the entities that conduct managed recharge on behalf of the IWRB.

Most Western States are faced with the challenge of managing existing water supplies along with the increasing or changing demands on the resource. Idaho is taking steps to actively address the current and future water supply needs on the Snake River Plain with a long-term adaptive management plan along with cooperation with the water users. The ESPA Managed Recharge Program in particular has highlighted the need for wide-ranging collaboration. The program would not have been possible or successful without the water users and the State working together to define and proactively address the problem. The Office of the Governor as well as the Idaho State Legislature have supported the program in the form of legislative direction as well as the commitment of a long-term funding source for the program which has been critical to the implementation of such a large-scale program. The partnership with canal owners to deliver recharge water through their canal systems and convey water to recharge basins has been a key component to the success and efficiency of the program. Communication between all the water users, State departments, and Federal agencies involved with the ESPA and the Snake River have been significantly increased to ensure the available water is used effectively. The IWRB will continue to collaborate with stakeholders to expand the State's managed recharge program to meet the goal of recharging an annual average of 250,000 acre-feet.

Submitted by Tom Neace, IDWR

This article is a summary from "Restoring a World Class Aquifer; A Brief History behind Managed Recharge and Conjunctive Management for Idaho's Eastern Snake Plain Aquifer" WaterReport ESPA Recharge, 2018; Stewart-Maddox, Thomas, Parham and Hipke.

Editor's Note: Why is ESPA recovery and stabilization important to well drillers? Ground water from aquifers provides an estimated 90 to 95% of Idaho's drinking water. There are 10 major aquifer systems in the state. All are experiencing various problems, ranging from declining water levels to population growth, or concerns about contamination. The ESPA is considered a forerunner for different problems in the Treasure Valley, Mountain Home, Wood River Valley, and the Palouse Aquifers. These issues create challenges and opportunities for well drillers: challenges to your ability to drill wells and the restrictions that will be placed on those wells; opportunities to participate as IDWR and other entities develop rules and regulations to manage ground water use, engage in the research to better understand this valuable resource, and potentially drill some of the monitoring and test wells.

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