BEAR RIVER COMMISSION

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MINUTES

BEAR RIVER COMMISSION
REGULAR MEETING
ONE HUNDRED TWENTY-THIRD COMMISSION MEETING
NOVEMBER 19, 2013

I. Call to order – The regular meeting of the Bear River Commission was called to order by Chairman Dee Hansen at 1:30 p.m. on Tuesday, November 19, 2013, at the Utah Department of Natural Resources building in Salt Lake City, Utah. This was the one-hundred and twenty-third meeting of the Commission. Hansen welcomed everyone to the meeting and asked that all in attendance introduce themselves. The Commission was pleased to welcome Eric Millis as the new Commissioner from Utah. An attendance roster is attached to these minutes as Appendix A.

I.B. Recognitions – There were recognitions made for two former members of the Commission. Gary Spackman noted that Marcus Gibbs had served as a commissioner from Idaho for a number of years and was replaced due to his position as a legislator for Idaho. Eric Millis reported that Dennis Strong had served as a commissioner from Utah for the past seven years and was being replaced as he was retiring from his position as Director of the Utah Division of Water Resources. Resolutions of appreciation were read for both Gibbs and Strong, and the Commission voted unanimously to accept these resolutions. The resolutions were signed by Commission members and will be sent to Marc Gibbs and Dennis Strong.

I.C. Approval of agenda – Chairman Hansen then addressed the agenda for the meeting. The agenda was approved without change, and a copy is attached to these minutes as Appendix B.

II. Approval of minutes of last Commission meeting – Hansen asked if there were any changes to the draft minutes of the previous Commission meeting held on April 10, 2013, in Salt Lake City, Utah. As there were no changes suggested, the minutes were approved.

III. Election of Secretary – Chairman Hansen explained that with Dennis Strong's retirement, it would be necessary to elect a new secretary to fill his place. Eric Millis was nominated to be the new Secretary of the Commission and was unanimously elected by the members of the Commission.

IV. Reports of Secretary and Treasurer – Randy Staker handed out sheets showing income and expenditures for FY2013 and for FY2014 to date (see Appendix C). He reported that at the end of FY2013, income plus the cash balance from the previous year totaled $245,068.98. Expenses for the year totaled $130,894.02, leaving a cash balance of $114.174.96. He pointed out

that the income from water quality agencies included two payments from FY2012 which were actually received in FY2013, making the income a little higher than would be expected. For FY2014, expenses to date totaled $88,654.60. There was a motion to approve the budget as presented. The motion was seconded and approved.

V.A. Report of the Technical Advisory Committee on depletions update effort – Don Barnett began by noting that the TAC had been working on the depletions update effort for about three years. He explained that the 1980 Amended Compact allowed some additional upstream storage and also some upstream depletions. It also allowed some depletions and storage in the Lower Division. With those allocations came the requirement that the states would estimate the depletions, and depletion limits were assigned by the Compact. The Compact required that the estimates be made using a Commission-approved procedure. That procedure was adopted in the early 1990s and included hiring university specialists from the three states to come up with a depletion estimate publication which was incorporated by the Commission into its procedures. As it had been 20 years since those depletion estimates were made, the TAC has been working on updating the estimates. Barnett showed the depletion estimates from 1990 and indicated that depletion categories included irrigation, municipal, industrial and reservoir evaporation. The procedures provide that the new acres be mapped and the acreage be determined and then multiplied by a depletion amount depending on the sub-basin. The process was to take 2009 aerial photography and use line work to identify each of the fields and then, through photography and field work, identify whether or not those fields are currently being irrigated. The TAC had to then wrestle with whether they would identify permitted acres or actual acres, and they ultimately determined to use developed acres. A comparison was then made of the 1976 base maps to the current findings. The states also refined the sub-basin boundary map. They tallied the acres within each of the sub-basins and multiplied them by the depletion rate per acre to come up with the full supply acre estimates. This was completed two years ago.

The states then turned to the issue of supplemental acres, which was more problematic. In the 1990 update effort, they simply took the number of supplemental acres and multiplied them by the depletion rate and then multiplied them by a shortage rate. Questions were raised relative to whether or not that was the best method. The states went back and went water right by water right to try to make a determination as to the amount of depletion associated with each of the water rights. Because of differences in data in each of the states and the methodology for collecting and measuring, each state needed to derive a different method for making those depletion estimates associated with supplemental acres. That included looking at some of their distribution records, pump records, water right files and interviewing irrigators.

As far as municipal depletions, Utah has a program with USGS where they tally and collect municipal water usage, so Utah relied on those data. Idaho and Wyoming used census data and multiplied those by a depletion amount per capita. On the industrial side there are only a handful of water rights in the states and so the TAC members reviewed the uses of each of those water rights and tallied the amount of diversion and estimated that all of those industrial water rights were 100 percent depletive.

On reservoir evaporation, the states simply looked at either new reservoirs or enlarged reservoirs and multiplied the increased surface area by an appropriate evaporation rate.

Barnett then turned some time over to each state to share their information and results. Jeff Peppersack from Idaho commented that mapping was a large effort for all of the states, but they felt

good about the tools used in coming up with the new irrigated acres. He felt that there is probably some debate between experts about what kind of depletion rate is appropriate for the Bear and that there could be as much as a 40 percent difference between what they are using and what other experts might say. It may boil down to the difference between actual and potential, with potential being defined as full water consumption under ideal conditions. His understanding was that the numbers used in the 1990s were more representative of actual depletions in the Bear, so the numbers could fall somewhere in-between. He felt that was important to Idaho, especially in the Central Division, because they are so close to their allocation limit. As to supplemental irrigation depletion, Idaho found that pumping records from Utah Power for a ten-year period provided the best data to determine annual flow. They were then able to estimate depletion by applying an irrigation efficiency number. He stressed that the results are only as good as the data used and that perhaps it would be good for them to work on improving water right records and flow measurements for the future. He noted on a map a couple of areas where water was diverted from an adjacent division that they needed to be aware of. He referred to a slide showing the various numbers from Idaho.

Todd Adams then gave the Utah report. With regard to the mapping process, he explained that the Division maps the State of Utah about once every six years, which was last done in 2009. They also do windshield surveys. Utah used the techniques that have already been referred to, and Adams noted that modern technology has helped to show a lot more detail which provided greater accuracy. They were able to correct errors that had been made years earlier. He reported that Utah does an M&I inventory every five years, which was last done in 2010. There was a big change in Cache Valley, with a lot of ground going out of production because of urbanization. He explained that the change in reservoir evaporation for Woodruff Narrows came from re-running a model that was used from 1976 to the early 80s, which included a lot of high water flows from a few years in the early 80s. They updated the water supplies and the data in the model to get a more accurate result. Adams mentioned that Utah had limited supplemental data. They used a mapping component and overlaid it with water rights information from the Division of Water Rights. They narrowed that down to a smaller amount of lands that have supplemental water supplies based on water rights. A group of people from Water Rights met with each land owner and determined the amount of supplemental use connected with each water right. He then showed Utah's results on a slide.

Jodee Pring reported for the State of Wyoming. As far as mapping, Wyoming used the same methods as the other states. She commended the GIS people for all the work they had done on this effort. They were able to resolve many discrepancies that existed from the 1990s to the present. As to supplemental depletions, Wyoming has the unique advantage of having diversion records for all of their water rights. The commissioners reviewed all of the diversion records for 2003-2012 and then inspected each of those rights. Using their own personal knowledge and interviews with irrigators, they calculated the days of use for each of those supplemental rights. They came up with a methodology using information from Bob Hill's report and adapted the Penman-Monteith reference calculated ET values from a couple of different weather stations and developed a depletion factor for an August alfalfa crop near Cokeville. They multiplied that depletion factor by the number of days the supplemental right was being used and the acreage it was irrigating. Pring referred to the Wyoming numbers on the slide.

Barnett summarized the report showing the depletion estimates versus allocations for the new 2009 update effort. He noted that the driving force in all of this and the frequency for which depletion updates need to be done has to do with the area above Stewart Dam in the State of Idaho.

The table shows about one-third of the depletion allocation yet remaining in that section of the river, with a much higher percentage in the rest of the divisions. He noted that these are the numbers they would look for the Commission to accept and use until the next depletion update effort in the future. Looking forward, they need to finalize the depletion memo to preserve it for history. The information will need to be included in the biennial report as required by the bylaws. Lastly, we need to look for ways of improving depletion estimates in the future. (A copy of the TAC's PowerPoint presentation is attached as Appendix D).

Chairman Hansen expressed appreciation from the Commission for the great work done by members of the Technical Advisory Committee on this effort. Sue Lowry mentioned that she appreciated the report to the Commission on all aspects of the update effort. She reported that the Management Committee had reviewed the draft report and felt that the numbers presented looked acceptable, while recognizing that different methodologies had to be used in each state. She stated that the Management Committee recommended that the Commission accept the report today, but give direction to the TAC to meet again fairly quickly and add a little bit of clarification to the text such that the description of how the numbers were calculated is clear for the TAC members that will pick up this effort in years to come. In a similar vein, to help those who come after us, it was suggested that the recommendation section be reviewed by the TAC and beefed up a little bit so that the procedures are clear, as well as any recommendations on how to make the estimates better in the future. With those recommendations, she felt the Management Committee was prepared to accept the report. She added that Gary Spackman came prepared with some thoughts or conditions to make note of, just recognizing the situation before us in 2013 as this report is accepted.

Spackman explained that in conferencing with the Management Committee and the Idaho TAC members, there was some concern about the limited additional depletions that are available to the State of Idaho above Stewart Dam. Those concerns were highlighted as the numbers from the three states came in. He noted that from the State of Idaho's computations, there is about a 60 percent additional depletion for those supplemental acres for water rights in the State of Idaho based on their method. His understanding is that for the State of Utah that percentage depletion is somewhere in the mid-30 percent area, and for the State of Wyoming that depletion number was about 10 percent. So the question that the State of Idaho has to ask themselves is why is their depletion number six times higher than Wyoming? There may be a number of reasons, but he was convinced that at least one of those reasons is that each of the states approached this in a different way. He spoke with the Idaho commissioners about what they wanted to do. The concern from the State of Idaho was that if they adopted a number that was a percentage depletion that much higher, somehow they would be penalizing themselves with a limited allocation. Based on those discussions with the commissioners and the fact that they are not exceeding the 2,000 acre-feet that they are allotted above Stewart Dam, Spackman came to the Commission meeting prepared to support adoption of these supplemental depletion numbers conditionally. Spackman passed out a copy of these conditions which is attached as Appendix E.

Lowry added that the Management Committee was in agreement that these three points are accurate. The states did have different methodologies in their computations, and it was agreed that taking another look at the supplemental piece of the whole depletion picture would be appropriate as it was probably the hardest and foggiest part of the effort. The Management Committee agreed that it would be fine to have these conditions reported into the record. There was a motion to accept the report on the depletion update, including the conditions presented, with the understanding that the TAC would do a little further text cleanup by February 1, 2014. The motion passed.

V.B. Changes to the depletion procedures – Lowry explained that along with the completion of the depletion estimate, the method for calculating supplemental shortage is not in line with the Commission's procedures. There are a number of procedures that have been adopted by the Commission over the years. It was determined that the procedures should be better organized and standardized. As part of that process, the procedure for calculating supplemental shortage would be updated. A draft of that procedure has been prepared for review. Memorandum BR2013-33 regarding potential updates to the Commission's procedures was sent out to the Commission and the TAC prior to the Commission meeting. As the TAC had not had sufficient time to review the procedures and the changes made, it was felt that they should make that review and be prepared to present the revised procedures for adoption by the Commission at its April 2014 meeting. This was presented as a motion which was approved by the Commission.

VI. Report on other activities of the TAC – Barnett noted the assignments just made to the TAC to finish up the depletion effort and the update of the procedures. Additionally, the TAC will look at procedures on the Lower Division water delivery schedule and the Bear Lake/Mud Lake equivalency. The TAC will also look at losses in the Central Division and the stream gaging program. Lowry added that the TAC had been exploring the topics of crop mix and ET rates and the Management Committee would like the TAC to prepare a short report on these two topics. The Management Committee would then decide what, if any, future assignment might be given on those topics.

VII. Paris Hills Development – Chairman Hansen then turned the time over to David Kramer, Vice President and General Manager of Paris Hills Agricom, to report on the Paris Hills development project. This project is a new underground phosphate operation located between the towns of Paris and Bloomington, Idaho. His PowerPoint presentation is attached as Appendix F.

As part of the project there is a significant amount of groundwater that will have to be pumped out of the ground in advance of mining. They would pump from up to 17 wells, with a peak predicted discharge of 16,500 gallons per minute. The pumped water would be piped to an injection well location approximately two miles to the east into the Salt Lake Formation at a depth of about 2,000 feet. Answering a question, Kramer explained that there would be some subsidence over the mine at the shallower depths, but probably not deeper into the mine. As the ground above the mine area is strictly pasture land, he felt there would be little impact to the surface area.

With relation to water management, there is a groundwater monitoring network with two piezometers installed at each of eight bore holes targeting the formations above and below where the mining would take place. They have constructed six monitoring wells and have drilled one production well, with a second one planned, and will be doing some pump tests. They have been collecting groundwater data on the monitoring wells since December of 2012. The groundwater that will be removed from the project area is of drinking water standards. The water from the valley floor is a little bit lower in quality, but still good.

Paris Hills has contracted with Whetstone Associates to do some studies concerning the hydrology of the project. They came on board in 2011, with Scott Effner heading up the hydrology program. Effner then made a presentation focusing on the geology and hydrology of the project. His PowerPoint is attached as Appendix G. As he was discussing the regional flow of water and the discharge areas, Barnett asked where the discharge point of the intercepted water would ultimately be. Effner said they were still working on understanding and defining that, but that it would be a

significant distance away from the mining area. Barnett wondered if the modeling efforts they are doing would pinpoint that a little better. Effner responded that it would not be part of the domain for the numerical model as it would force the scale to be too large for their simulation. It will, however, be part of the overall hydrologic analysis of the project as they would definitely be looking at the water balance for the basin. Barnett stressed that even though this is a non-consumptive operation, the difference as to where the discharge will actually end up compared to where it would have been is critically important to the operations of the three states involved. Barnett asked what kind of pressures would be required to inject 36 cfs. Effner responded that they had not done a full analysis on that. Part of it will be governed by the carrying capacity of the formation and the gravity flow of the mine. Barnett asked if they anticipate doing a pump test or an injection test on the receiving aquifer to which Effner responded that they will definitely do that and that they still have work to do on the characterization of the injection well field area.

Another person noted that over a period of ten years, they would be injecting over a quarter of a million acre-feet of water. Questions were asked as to where all of that water would go and if it would surface again. Effner responded that the injection well area covers a large area (four miles from north to south) and that the water would stay in the overall groundwater system of the basin. The local horizon would have to move out laterally along the basal conglomerate. Some of it will go down a bit along that horizon, but it's going to have to spread out away from the center. He didn't think the water would be lost, but would surface. He explained that on a local scale, the two flow systems are fairly well isolated, with little seepage going back and forth, but on a larger basinwide scale, these features all sort of come into each other, so that water remains within the aquifer systems in the basin. He also noted that they are monitoring local wells in the area, and Paris Hills has made a commitment to mitigate any impact to wells in the areas. They don't expect any impact to wells east of the mine, but the small number of wells in the Wells Formation directly north or south of the mine would be more likely to be impacted.

Spackman asked what applications they expect to file with the State of Idaho. Effner replied that the permits they will need from the Idaho Department of Water Resources are basically related to well installation and permitting. It was noted that they would probably consume about 275 gal/min for moisture in the rock leaving the property. They don't intend to apply for a new water right, but rather to buy a local water right and transfer the use to their project. Commissioner Spackman indicated that they had better have a discussion with him.

VIII. FWS water conservation efforts in the Bear River – Sharon Vaughn, Deputy Refuge Manager at the Bear River Migratory Bird Refuge in Brigham City, Utah, made a presentation on the Bear River Watershed Conservation Area (see Appendix H). She explained that the mission of the U.S. Fish & Wildlife Service is "working with partners to conserve, protect and enhance the fish, wildlife and plants and their habitats for the United States, the American people and for future generations." This project is the "with partners" part of the effort. Water is the life blood for sustaining three national wildlife refuges and a waterfowl production area, so they need adequate water of good quality to maintain those wildlife populations. Vaughn explained that the Bear River Migratory Bird Refuge is part of the Great Salt Lake ecosystem and is globally significant to migratory birds. The Bear River watershed habitat also supports numerous other animals and fish. Population growth in the area is quickly increasing which results in a greater demand for water. This, along with climate change and conversion of irrigation water to domestic and industrial use, will affect water availability and quality. They have worked on studies, models and conservation plans for the area. The plans have been approved and they are looking for funding. They are seeking perpetual conservation easements with willing sellers. There is a lot of interest in the

program from landowners and many entities in the three states are expressing their support. They are trying to get the word out through outreach efforts.

Barnett expressed appreciation to Vaughn for her presentation to the Commission and for the efforts of the U.S. Fish & Wildlife Service to maintain communication with the Commission on their projects and efforts.

The Commission then took a short break.

IX. Records & Public Involvement Committee report – Charles Holmgren reported that the Records & Public Involvement Committee had met earlier and discussed the Comprehensive Conservation Plan by FWS at the Mud Lake area. They appreciate the renewed efforts by FWS to recognize the role of the Commission in the Bear River Basin and keep an open communication between both entities. The Committee looked at the possibility of combining a symposium at Mud Lake with the annual Commission meeting in April. After discussion, it was suggested that the Commission should go ahead with their annual meeting in April as planned and then look at the possibility of the symposium later when the weather would be better. They asked for guidance from the Commission as to the possible symposium at Mud Lake and the involvement of the Commission in that event. It was agreed that the two items should be held separately as suggested and that the symposium might be best held in late May or early June.

The Committee discussed the Watershed Information System site that is maintained by Utah State University. This site was made possible by a grant from the EPA, which should be acknowledged on the site. The Committee also discussed stream gaging issues, and Holmgren noted that there would not be any fee increases in the coming year. Water quality agencies from the three states are still contributing to the funding for these gages. There was talk about including canal measurement and real time data in future biennial reports as that information becomes more reliable. He noted that Wyoming is taking measurements at Woodruff, Sulphur Creek and Whitney Reservoirs to check on capacities and drawdowns.

Holmgren reported that the 17th Biennial Report was completed and presented to the Committee, and copies were given to the three states and sent to the President. It will also be available on the Commission website for the general public. Data is being gathered for the 18th Biennial Report, and the Commission members were asked for ideas for pictures which could be used for the cover of the report.

The Committee reviewed the Commission's policies and procedures. Don Barnett had gone through the procedures to organize them, standardize the format and make necessary changes as a result of the update on depletions. The Committee recommended that these format and organizational changes to the policies and procedures be approved by the Commission, with the understanding that there would be minor edits as they finish the depletion update. The Commission agreed with this recommendation.

X. Operations Committee report – Sam Lowham reviewed items discussed in the Operations Committee. The Upper Division distribution was not formally regulated in 2013. Woodruff Narrows and Whitney Reservoirs did not fill. The Central Division was formally regulated beginning in late May.

Connely Baldwin gave a summary on Bear Lake operations (see Appendix I). It was a very dry year, but they were able to meet peak demand downstream. They had some concerns over contracts by the end of the season, but they had enough natural flow to cover that. He reported that there was a drawdown on Alexander Reservoir in August for repairs, which was refilled. Cutler Reservoir was also drawn down, beginning in mid-October and continuing into early 2014, for spill gate repairs. Baldwin noted that with a normal snow pack and runoff over the winter, the 2014 allocation would probably the same as 2013. Even with a worst-case scenario, the irrigation allocation would be close to a full allocation as the lake is still high enough to accommodate that.

Regarding Commission procedures, Lowham noted that the Operations Committee did instruct the TAC to look at the Mud Lake/Bear Lake Equivalency due to the sediment and new dikes. They are also to look at the delivery schedule on the Lower Division. The Committee also discussed new water proposals of interest, with Paris Hills being the main one.

XI. Water Quality Committee report – Jack Barnett substituted for Walt Baker in giving the report from the Water Quality Committee. He noted that many of the items of discussion had already been addressed. Highlights of the meeting included the following: The water quality agencies will continue to fund the WIS at Utah State University to keep it active, and Mike Allred will be heading up a committee that will interface with the staff at Utah State. The water quality agencies will also continue to contribute to the Commission's stream gaging effort, as had been reported earlier. He felt it was important to know that the water quality agencies are also doing water quality monitoring four times a year through the basin. They now have six years of records, and he noted that this information has been helpful to Idaho as they were working on parameters in water quality standards on their portion of the Bear River.

The Water Quality Committee spent a good deal of time with the FWS discussing the CCP report for the Bear Lake Refuge. The term "water management plan" is used in the report, and the Refuge Manager is charged with leading out on preparing it. The Water Quality Committee will continue to shepherd this effort, and it is likely that FWS will be invited to participate in the Mud Lake Symposium in the spring. The TAC is also urged to look at what this water management plan might be and then report back to the Commission on any developments.

XII. Management Committee report – Sue Lowry explained that everything discussed in the Management Committee meeting has been covered in other agenda items, so she had nothing further to present.

XIII. Engineer Manager's report – Don Barnett noted that all of his items of interest had also been covered earlier in the meeting.

XIV. State Reports – Wyoming – Lowry reported that the Supreme Court litigation between Wyoming and Montana was currently at trial, and the State Engineer and staff have spent lots of time in preparation for the trial. They were hopeful that the trial would be completed by early December. On another topic, Lowry reported that they don't have a lot of groundwater usage for irrigation purposes. In the eastern part of Laramie County, the State Engineer has put a moratorium on any high capacity wells in that area. There is a consultant on board who is preparing a report on the subject. Much of this was driven not by irrigation, but by an interest in industry to actually drill wells in Wyoming to take water for oil and gas work in northern Colorado. That moratorium will likely be reviewed soon. There was another case where a water commissioner north of Cheyenne got a call to regulate a well for the benefit of a senior surface

water right. This action was overturned by the superintendent in that division. His action was appealed to the State Engineer. All of this led to a groundwater order being issued, which was quite detailed. The bottom line is that during these dry conditions, there are a lot more groundwater/surface water interactions which have to be dealt with using the authority provided by state statutes.

XIV. State Reports – Idaho – Gary Spackman had nothing he felt he needed to share with the group.

XIV. State Reports – Utah – Eric Millis reported that Utah continues to do planning work on their Bear River water development project which is four or five years away. The cloud seeding contracts are about done and they are looking forward to many good storms this winter. In the Logan to Smithfield area, construction of the Cache Highline Canal replacement project is about finished and the project operated very well this last year. The anticipated savings of 8,000 acre-feet has helped ensure that users in the area had plenty of water even in the dry year.

XIV.A. Activities of the Bear River Water Users Association – Carly Burton commented on the very dry year and noted that in addition to the low runoff, the relentless heat of the summer made things even worse. As the Association dealt with the drought conditions and considered the possibilities that came with the drought, they met and considered contingency plans. He felt it would be wise to be more creative in finding ways to deal with these dry years, while keeping within the legal constraints of the Compact and Settlement Agreement. Burton suggested that the Association was anxious to work with PacifiCorp, the irrigators and others involved to find the best way to use and optimize the storage water allocation among the users. They would like to have a plan in place to ensure that Bear River Water Users Association members can survive and get their crops watered.

XIV.B. Bear Lake Watch – Claudia Cottle represented Bear Lake Watch. She reported that Merlin Olsen, past president of Bear Lake Watch, always hoped that there could be sound, scientific data to guide the stewardship of Bear Lake and use that to make decisions rather than relying on emotion or intuition. In his honor, a research fund has been created which is funded through a golf tournament, the Merlin Olsen Summer Classic. This has been going on for two years, and there is about $65,000 in the fund that will go toward research. This is intended to be a fund that is overseen by the Bear Lake Science Advisory Team (BLAST). They will be meeting with the Bear Lake Watch Board and consulting with Bear River Water Users, the power company, Utah State University and others that have knowledge of Bear Lake. They have contracted with the Quinney Natural Resources Library at Utah State. They have started to compile a library of all the scientific papers, data, etc. on Bear Lake. They will prepare a synopsis of the materials for use in this project. The team will research what is known, and continue to work as a Bear Lake community to utilize these funds in a manner that will help everyone with their stewardship of Bear Lake. They may use some of those funds to sponsor the Mud Lake Symposium.

XVI. Next Commission meeting – Chairman Hansen noted that the next Commission meeting was scheduled for April 15, 2014.

The meeting was then adjourned.

ATTENDANCE ROSTER

BEAR RIVER COMMISSION
ANNUAL MEETING
Utah Department of Natural Resources Building
Salt Lake City, Utah
November 19, 2013

IDAHO COMMISSIONERS
Gary Spackman
Kerry Romrell
Curtis Stoddard

WYOMING COMMISSIONERS
Sue Lowry
Gordon Thornock
Sam Lowham
Jade Henderson (Alternate)

FEDERAL CHAIR
Dee Hansen

UTAH COMMISSIONERS
Eric Millis
Charles Holmgren
Blair Francis
Joe Larsen (Alternate)
Norm Weston (Alternate)

ENGINEER-MANAGER & STAFF
Don Barnett
Jack Barnett
Donna Keeler

OTHERS IN ATTENDANCE

IDAHO
Josh Hanks, Watermaster
James Cefalo, Department of Water Resources
Jeff Peppersack, Department of Water Resources
Liz Cresto, Department of Water Resources

UTAH
Will Atkin, Division of Water Rights
Carl Mackley, Division of Water Rights
Todd Adams, Division of Water Resources
Randy Staker, Division of Water Resources

WYOMING
Mike Johnson, State Engineer's Office
Don Shoemaker, State Engineer's Office
Kevin Payne, State Engineer's Office
Jodee Pring, State Engineer's Office

OTHERS
Connely Baldwin, PacifiCorp Energy
Claudia Conder, PacifiCorp Energy
Cory Angeroth, U.S. Geological Survey
Ben Radcliffe, Bureau of Reclamation
Sharon Vaughn, Fish & Wildlife Service
Mitch Poulsen, Bear Lake Regional Commission
David Cottle, Bear Lake Watch
Claudia Cottle, Bear Lake Watch
Carly Burton, Bear River Water Users Association

Randy Budge, Bear River Water Users Association
Darin McFarland, Bear River Canal Company
Bob Fotheringham, Cache County
Adrian Hunolt, Whitney Reservoir
Dennis Strong, Davis County
Dave Kramer, Paris Hills
Jim Geyer, Paris Hills
Aaron Trevino, Paris Hills
Scott Effner, Whetstone Associates
Scott Clark, Barnett Intermountain Water Consulting

BEAR RIVER COMMISSION ANNUAL MEETINGS
November 19, 2013

Water Quality Committee Meeting
Utah Department of Environmental Quality
195 North 1950 West
Salt Lake City, Utah

All Other Meetings
Utah Department of Natural Resources
1594 West North Temple
Salt Lake City, UT

COMMISSION AND ASSOCIATED MEETINGS

November 18

10:00 a.m.	Water Quality Committee Meeting – Red Rock Conference Room	Burnell

November 19

9:00 a.m.	Records & Public Involvement Committee Meeting – Room 314	Holmgren
10:00 a.m.	Operations Committee Meeting – Room 314	Lowham
11:30 p.m.	Informal Meeting of Commission – Room 314	D. Barnett
11:45 p.m.	State Caucuses and Lunch	Spackman/Millis/Lowry
1:30 p.m.	Commission Meeting – Main Floor Auditorium (Rms. 1040/1050)	Hansen

PROPOSED AGENDA
ANNUAL COMMISSION MEETING

November 19, 2013

Convene Meeting: 1:30 p.m.
Chairman: Dee Hansen

I.	Call to order	Hansen
	A. Welcome of guests and overview of meeting	
	B. Recognitions	
	C. Approval of agenda	
II.	Approval of minutes of last Commission meeting	Hansen
III.	Election of Secretary	Hansen
IV.	Reports of Secretary and Treasurer	Secretary/Staker
	A. 2013 budget closeout	
	B. 2014 expenditures to date	
	C. Other	
V.	Report of the Technical Advisory Committee on depletions update effort	
	A. Depletions update efforts	Barnett
	B. Changes to the depletion procedures	Lowry
	C. Direction from the Commission	Lowry
VI.	Report on other activities of the TAC	Barnett
VII.	Paris Hills Development	Kramer
VIII.	FWS water conservation efforts in the Bear River	Vaughn

BREAK

IX.	Records & Public Involvement Committee report	Holmgren
	A. Adoption of revised procedures	
X.	Operations Committee report	
	A. Committee meeting	Lowham
	B. Operations in 2013	
	C. PacifiCorp operations	Baldwin
XI.	Water Quality Committee report	Baker
XII.	Management Committee report	Lowry
XIII.	Engineer-Manager's report	Barnett
XIV.	State reports	
	A. Wyoming	Lowry
	B. Idaho	Spackman
	C. Utah	Strong

XV.	Other / Public comment	Hansen
	A. Activities of the Bear River Water Users Association	Burton
	B. Bear Lake Watch	Cottle
	C. Other	
XVI.	Next Commission meeting (Tuesday, April 15, 2014)	Hansen

Anticipated adjournment: 4:00 p.m.

BEAR RIVER COMMISSION

STATEMENT OF INCOME AND EXPENDITURES

FOR THE PERIOD OF July 1, 2012 to June 30, 2013

INCOME	CASH ON HAND	OTHER INCOME	FROM STATES	INCOME
Cash Balance 07-01-12	103,579.01			103,579.01
State of Idaho		-	40,000.00	40,000.00
State of Utah		-	40,000.00	40,000.00
State of Wyoming		-	40,000.00	40,000.00
Water Quality		12,778.00		12,778.00
US Fish & Wildlife		7,809.97		7,809.97
Interest on Savings		902.00		902.00
TOTAL INCOME TO 30-Jun-13	103,579.01	21,489.97	120,000.00	245,068.98

DEDUCT OPERATING EXPENSES

		APPROVED BUDGET	UNEXPENDED BALANCE	EXPENDITURES TO DATE
Stream Gaging/USGS Contract		55,660.00	-	55,660.00
	SUBTOTAL	55,660.00	-	55,660.00
EXPENDED THROUGH COMMISSION				
Personal Services	BIWC	60,500.00	(0.04)	60,500.04
Travel (Eng-Mgr)		1,200.00	113.93	1,086.07
Office Expenses		1,600.00	1,038.42	561.58
Printing Biennial Report		1,000.00	1,000.00	-
Treasurer Bond & Audit		1,400.00	1,300.00	100.00
Printing		1,600.00	829.66	770.34
Realtime Web Hosting		8,400.00	1,184.01	7,215.99
Clerical		5,000.00	-	5,000.00
Contingency		3,000.00	3,000.00	-
	SUBTOTAL	83,700.00	8,465.98	75,234.02
TOTAL EXPENSES		139,360.00	8,465.98	130,894.02
CASH BALANCE AS OF 06/30/13				114,174.96

BEAR RIVER COMMISSION

DETAILS OF EXPENDITURES

FOR PERIOD ENDING June 30, 2013

754	STONEFLY TECH	1,800.00
755	BIWC	15,427.93
756	USGS	55,660.00
757	STONEFLY TECH	1,800.00
758	BIWC	5,125.69
759	BIWC	6,078.63
760	VOID	
761	STONEFLY TECH	1,800.00
762	BIWC	13,408.96
763	BIWC	6,025.70
764	C N A SURETY	100.00
765	STONEFLY TECH	15.99
766	VOID	
767	BIWC	5,529.36
768	VOID	
769	STONEFLY TECH	1,800.00
770	BIWC	5,135.37
771	VOID	
772	VOID	
773	BIWC	10,909.98
774	BIWC	53.45
775	BIWC	222.96
	TOTAL EXPENSE	130,894.02

BANK RECONCILIATION

Cash in Bank per Statement 06/30/13	13,817.98
Plus: Intransit Deposits	
Less: Outstanding Checks	
Total Cash in Bank	13,817.98
Plus: Savings Account-Utah State Treasurer	100,356.98
TOTAL CASH IN SAVINGS AND IN CHECKING ACCOUNT	114,174.96

BEAR RIVER COMMISSION

STATEMENT OF INCOME AND EXPENDITURES

FOR THE PERIOD OF July 1, 2013 to November 13, 2013

INCOME	CASH ON HAND	OTHER INCOME	FROM STATES	INCOME
Cash Balance 07-01-13	114,174.96			114,174.96
State of Idaho			40,000.00	40,000.00
State of Utah			40,000.00	40,000.00
State of Wyoming			40,000.00	40,000.00
Water Quality		3,236.00		3,236.00
US Fish & Wildlife				
Interest on Savings		262.34		262.34
TOTAL INCOME TO 13-Nov-13	114,174.96	3,498.34	120,000.00	237,673.30

DEDUCT OPERATING EXPENSES

		APPROVED BUDGET	UNEXPENDED BALANCE	EXPENDITURES TO DATE
Stream Gaging/USGS Contract		57,120.00	-	57,120.00
	SUBTOTAL	57,120.00	-	57,120.00
EXPENDED THROUGH COMMISSION				
Personal Services	BIWC	61,100.00	35,641.65	25,458.35
Travel (Eng-Mgr)		1,200.00	798.35	401.65
Office Expenses		1,600.00	1,465.00	135.00
Printing Biennial Report		1,000.00	1,000.00	-
Treasurer Bond & Audit		1,400.00	1,400.00	-
Printing		1,600.00	1,300.40	299.60
Realtime Web Hosting		8,400.00	4,800.00	3,600.00
Clerical		6,000.00	4,360.00	1,640.00
Contingency		2,000.00	2,000.00	-
	SUBTOTAL	84,300.00	52,765.40	31,534.60
TOTAL EXPENSES		141,420.00	52,765.40	88,654.60
CASH BALANCE AS OF 11/13/2013				149,018.70

BEAR RIVER COMMISSION

DETAILS OF EXPENDITURES

FOR PERIOD ENDING November 13, 2013

776	BIWC	10,183.34
777	STONEFLY TECH	1,800.00
778	BIWC	5,639.22
779	USGS	57,120.00
780	STONEFLY TECH	1,800.00
781	BIWC	6,328.46
782	BIWC	5,783.58

TOTAL EXPENSE 88,654.60

BANK RECONCILIATION

Cash in Bank per Statement 11/13/13	8,399.38
Plus: Intransit Deposits	
Less: Outstanding Checks	
Total Cash in Bank	8,399.38
Plus: Savings Account-Utah State Treasurer	140,619.32
TOTAL CASH IN SAVINGS AND IN CHECKING ACCOUNT	149,018.70

2009 Depletion Estimates
TAC Report

November 19, 2013

BEAR RIVER COMMISSION

Background

- 1980 – Amended Bear River Compact recognized water placed to beneficial use before January 1, 1976 and then provided for additional depletions as follows:
- Above Stewart Dam:

Utah	13,000 af
Wyoming	13,000 af
Idaho	2,000 af

Lower Division:

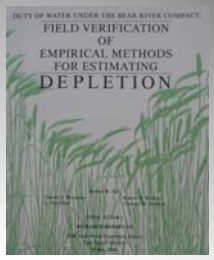
Idaho	125,000 af (first right)
Utah	275,000 af (second right)
Idaho & Utah	75,000 af (each, equal priority)
Idaho	30% of remainder
Utah	70% of remainder

- The Compact provides that the allowed depletions "shall be calculated and administered by a Commission-approved procedure."

BEAR RIVER COMMISSION

Background (cont.)

- 1989 – the Commission adopted *interim* Commission-approved procedures. The Commission had also contracted with Utah State University to develop a method for estimating irrigation depletions (Research Report 125) and was working on 1976 base maps and 1990 updates.
- 1993 – the Commission adopted revised Commission-approved procedures and adopted the 1990 depletion estimates prepared by the states. The 1990 depletion estimates are as follows and have been included in each biennial report since their adoption.



BEAR RIVER COMMISSION

1990 Depletion Estimates

Estimated Annual Depletions[1]
Changes from January 1, 1976, to January 1, 1990

ABOVE STEWART DAM

State	Allocation	Agricultural Depletions	M&I Depletions	Total Depletions	Remaining Allocation
Wyoming	13,000	1,996	781	2,777	10,223
Idaho	2,000	1,293	0	1,293	707
Utah	13,000	5,106	177	5,283	7,717

Lower Division

State	Allocation	Agricultural Depletions	M&I Depletions	Total Depletions	Remaining Allocation
Idaho	125,000[2]	7,348	-48	7,300	117,700
Utah	275,000[3]	2,936	1,178	4,114	270,886

[1]All values are in acre-feet. Data were obtained from the appendices of the April 22, 1992, Bear River Commission meeting minutes. Any reductions in pre-1976 depletions are reflected in the above numbers. With the exception of Woodruff Narrows Reservoir, reservoir evaporation was not calculated.
[2]First right under Compact grants additional rights.
[3]Second right under Compact grants additional rights.

BEAR RIVER COMMISSION

Depletion Categories

- Irrigation
  - New acres
  - Supplemental acres
- Municipal
- Industrial
- Reservoir Evaporation

BEAR RIVER COMMISSION

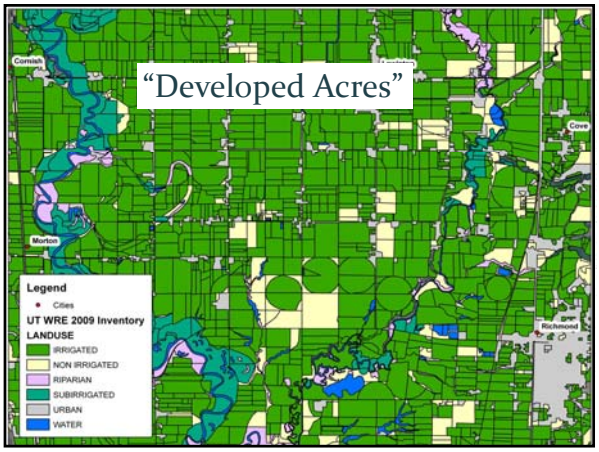
Depletion – New Acres

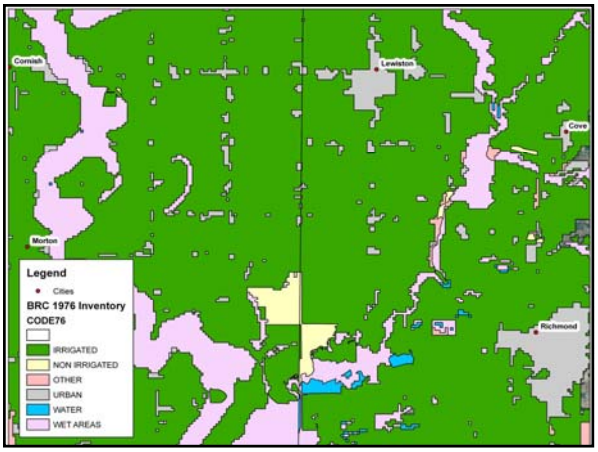
"Depletion amounts from new irrigated lands, put in production since January 1, 1976, will be determined by multiplying the acreage brought into production by the irrigation depletion of the crop mix within a subbasin. The irrigation of new lands will be charged an irrigation depletion based on the values reported in Table 15 of Research Report #125…"

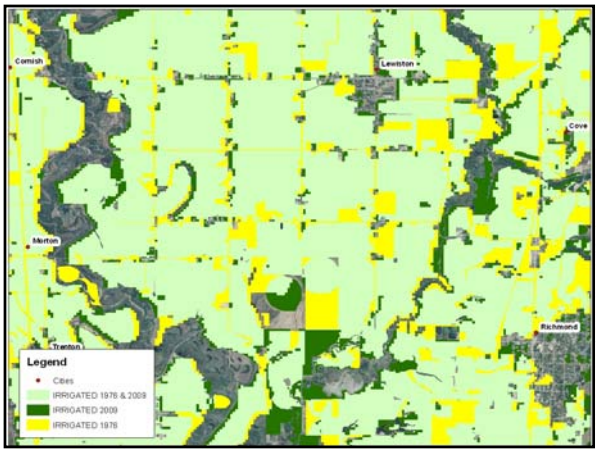
BEAR RIVER COMMISSION

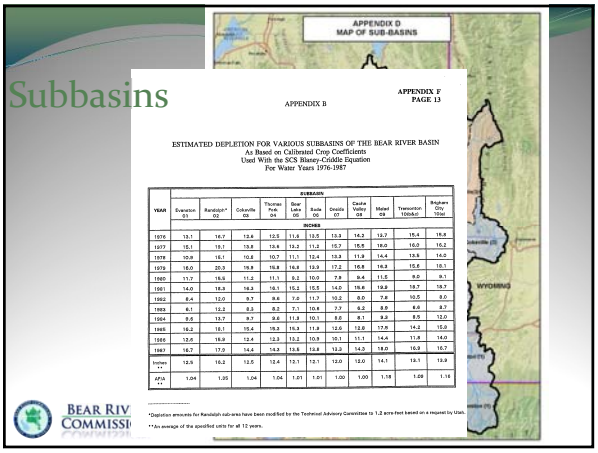

Cornish
Lewiston
Cove
Morton
Trenton
Richmond
Legend
Cities


Cornish
Lewiston
Cove
Morton
Trenton
Richmond
Legend
Cities
UT WRE 2009 Inventory


"Developed Acres"
Cornish
Cove
Morton
Richmond
Legend
Cities
UT WRE 2009 Inventory
LANDUSE
IRRIGATED
NON IRRIGATED
RIPARIAN
SUBIRRIGATED
URBAN
WATER


Cornish
Lewiston
Cove
Morton
Richmond
Legend
Cities
BRC 1976 Inventory
CODE76
IRRIGATED
NON IRRIGATED
OTHER
URBAN
WATER
WET AREAS


Cornish
Lewiston
Cove
Morton
Trenton
Richmond
Legend
Cities
IRRIGATED 1976 & 2009
IRRIGATED 2009
IRRIGATED 1976


Subbasins
APPENDIX D
MAP OF SUB-BASINS
APPENDIX B
APPENDIX F
PAGE 13
ESTIMATED DEPLETION FOR VARIOUS SUBBASINS OF THE BEAR RIVER BASIN
As Based on Calibrated Crop Coefficients
Used With the SCS Blaney-Criddle Equation
For Water Years 1976-1987
WYOMING

Irrigation – Supplemental Acres

- In 2009 multiplied acres by a subbasin shortage rate from a 1972 USU report
- April 2013 instructed TAC to find a more current and water right specific method
- Each state reviewed their list of supplemental water rights and estimated usage based on:
  - Distribution records
  - Pump records
  - Water right files
  - Interviews with irrigators

BEAR RIVER COMMISSION

M&I Depletion Estimates

- Municipal Depletion Estimates
  - Water use data
  - Census data
- Industrial Depletion Estimates
  - Review of each water right
  - Generally estimate 100% depletion

BEAR RIVER COMMISSION

Reservoir Evaporation

- Each state reviewed reservoirs constructed or enlarged since 1976 and multiplied the surface area by the an appropriate evaporation rate.

BEAR RIVER COMMISSION

State Issues and Results

Idaho – Issues/Solutions

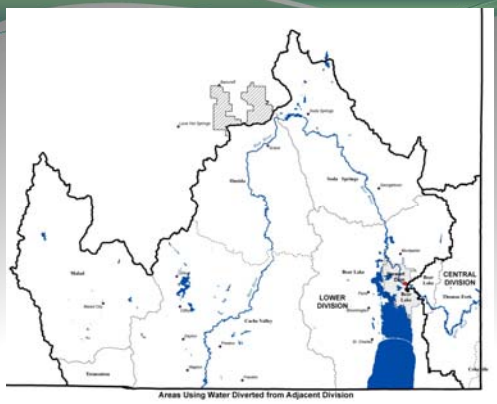
- Mapping
- Lands outside of basin
- Limited supplemental pumping data

Mapping

- Similar issues and resolutions between states
- Good imagery and tools available to identify new irrigated acres
- Depletion values for irrigated acres
  - "Actual" ET vs potential ET (expert opinions)
  - Potential ET does not represent field conditions
  - Is "actual" ET a moving target (changes in crop types, better water application, fertilizer)?
  - Higher depletion values reduces remaining allocation

Supplemental Irrigation Depletion

- PCC method – relationship between power and flow
  - Electric-driven pumps (Utah Power records 2003 to 2012)
  - Use kWh to estimate annual volume pumped
- Estimate depletion from irrigation system efficiency
  - Sprinkler systems
  - Published values for pivots or hand/wheel lines
- Results are only as good as the data used
  - 0.59 AF/acre in Central Division, 0.69 AF/acre in Lower
  - Water right records
  - Flow measurements



Idaho – Results

Irrigation Depletion Estimates			
Above Stewart Dam			
Acres		Depletion (acre-feet)	
Full Supply	Supplemental	Full Supply	Supplemental
851 ac	739 ac	874 af	436 af
Lower Division			
Acres		Depletion (acre-feet)	
Full Supply	Supplemental	Full Supply	Supplemental
2303 ac	8924 ac	2509 af	6158 af

M&I Depletion Estimates	
Above Stewart	3 af
Lower Division	300 af

Reservoir Evaporation	
Above Stewart	0 af
Lower Division	11 af

Utah – Issues/Solutions

- Mapping
- Lands outside of basin
- Limited supplemental data

Utah – Results

Irrigation Depletion Estimates			
Above Stewart Dam			
Acres		Depletion (acre-feet)	
Full Supply	Supplemental	Full Supply	Supplemental
421 ac	951 ac	500 af	5435 af
Lower Division			
Acres		Depletion (acre-feet)	
Full Supply	Supplemental	Full Supply	Supplemental
-8555 ac	12044 ac	-8684 af	4113 af

M&I Depletion Estimates	
Above Stewart	119 af
Lower Division	20459 af

Reservoir Evaporation	
Above Stewart	841 af
Lower Division	0 af

Wyoming – Issues/Solutions

- Mapping
- Supplemental depletions

Wyoming – Results

Irrigation Depletion Estimates			
Above Stewart Dam			
Acres		Depletion (acre-feet)	
Full Supply	Supplemental	Full Supply	Supplemental
1083 ac	2292 ac	1126 af	1281 af

M&I Depletion Estimates	
Above Stewart	401 af

Reservoir Evaporation	
Above Stewart	197 af

Depletion Estimates vs Allocations

Above Stewart Dam

State	Allocation	Agricultural Depletions	M&I Depletions	Reservoir Evaporation	Total Depletions	Remaining Allocation
Utah	13,000	5,935	119	841	6,895	6,105
Wyoming	13,000	2,407	401	197	3,005	9,995
Idaho	2,000	1,310	3	0	1,313	687

Lower Division

State	Allocation	Agricultural Depletions	M&I Depletions	Reservoir Evaporation	Total Depletions	Remaining Allocation
Idaho	125,000[2]	8,667	300	11	8,978	116,022
Utah	275,000[3]	-5,771	20,459	0	14,688	260,312

Depletion Estimates – Moving Ahead

- Finalize Report
- Report Estimates in Biennial Report
- Improvements in Future Estimates
- ????

Bear River Supplemental Depletions

Suggested Conditions for Inclusion in Depletion Totals

- The Bear River Commission recognizes that the methods to determine supplemental depletions employed by each of the states that are party to the Bear River Compact are significantly different and each may have inherent weaknesses in determining the actual depletions from supplemental water use. These differences in the methods for determining supplemental depletions likely contributed to a large disparity between the amounts of total depletion attributable to supplemental use calculated for each state.

- A change to any of the components of the Bear River Compact depletion analysis, including, but not limited to the net depletion per acre for irrigation or number of acres irrigated, shall automatically trigger a redetermination of supplemental depletions by the states that are parties to the Bear River Compact.

- The states that are party to Bear River Compact commit to cooperatively developing a more uniform method of determining supplemental depletions that will create confidence in the accuracy of the depletions attributable to supplemental use.

Paris Hills Agricom Inc.

Phosphate Mine Project

Paris Hills Project Information:

- Acquired property in 2009
- Exploration drilling completed in 2010 - 2012
- Feasibility study completed in December 2012
- Currently engaged in permitting activities
- Initial construction expected in 4th quarter of 2014; initial mining expected in early 2015 depending on permit approval and financing

Committed to:
Safety
Environmental Protection
Local Communities

PARIS HILLS AGRICOM INC.

Project Location

PARIS HILLS AGRICOM INC.

Feasibility Study Highlights

PARIS HILLS AGRICOM INC.

- All phosphate rock extracted by underground mining methods
- Phosphate rock is transported directly from the mine to market
- Mine life of 19 years; potential to increase mine life
- Limited surface facilities including:
  - administration office, maintenance shop, warehouse, water management ponds, crushing facility, access road and rail loadout
- Peak manpower of 358 employees
- Groundwater pumping required in mine area to ensure an efficient, environmentally sound and safe operation

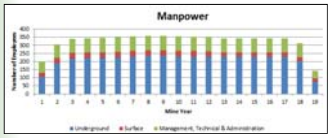
Manpower

PARIS HILLS AGRICOM INC.

Peak manpower of 358 employees to include:

- 88 management, technical and administration personnel
- 36 surface personnel
- 234 underground personnel

Committed to hiring and training locally



Equipment operators and labor helpers

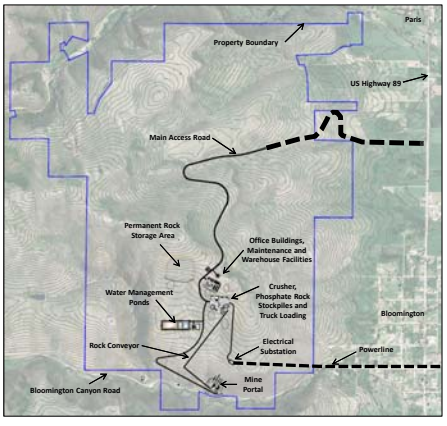
Electricians and maintenance personnel

Office and technical personnel

Surface Facilities

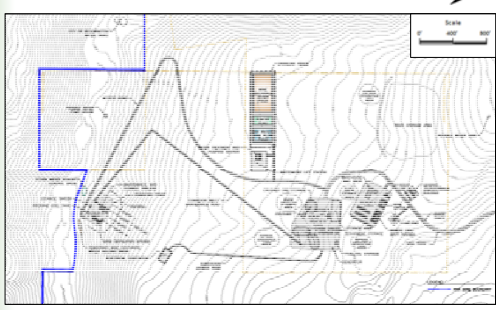
- Small disturbance footprint
- Minimal visual impact
- No rock processing facilities on the site
- Rock is directly transported and processed off site

PARIS HILLS AGRICOM INC.



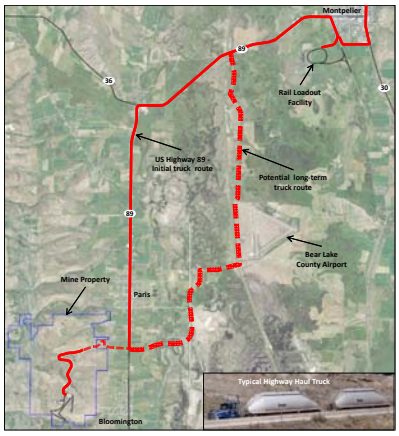
Surface Facilities

PARIS HILLS AGRICOM INC.



Transportation Routes and Rail Loadout Facility

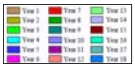
- Rock is transported directly from the mine to market
- Market possibilities include:
  - trucked locally to Soda Springs
  - trucked to rail loadout facility then transported to distant locations (including overseas)
- Hwy. 89 used initially for trucking to Montpelier then alternate, long-term route will be used
- Trucking 5 days per week, 12 hours per day



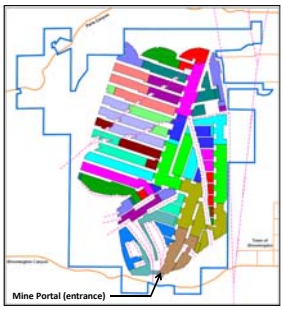
Mine Plan

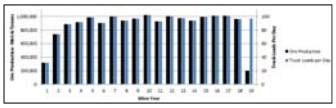
Room and Pillar Mining Method

Year rock is extracted



Legend
Roads
Faults





PARIS HILLS AGRICOM INC.

Underground Mining Equipment

PARIS HILLS AGRICOM INC.

Continuous Miners (cuts the rock)

Shuttle Cars (transport the rock to feeder breaker)

Roof Bolter (bolts the roof to make it stable)

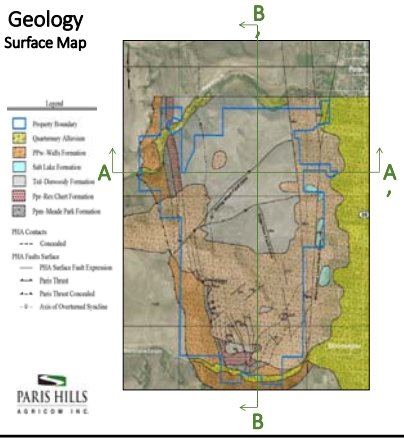
Feeder Breaker
(breaks the rock and feeds to the conveyor)
Rock is conveyed to the surface after the feeder breaker

Mobile Roof Support (stabilizes the roof)

Scoop (cleans up the floor)

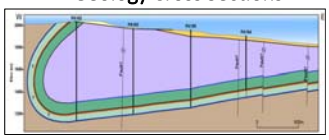
Geology

Surface Map

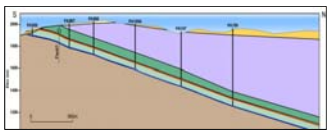


PARIS HILLS AGRICOM INC.

Geology Cross Sections



East-West section looking North (A – A')



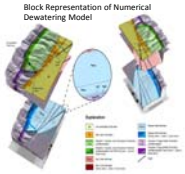
North-South section looking West (B – B')

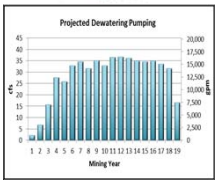
PARIS HILLS AGRICOM INC.

Mine Dewatering

- The underground mine will require dewatering to ensure safe working conditions
- Numerical modeling indicates that pumping from up to 17 wells will be needed to lower groundwater levels
- Dewatering will start in year 1 and has a peak predicted discharge of 36.8 cfs (16,500 gpm)
- Pumped water will be injected into the Salt Lake Formation at a depth of about 2,000 feet below the valley floor

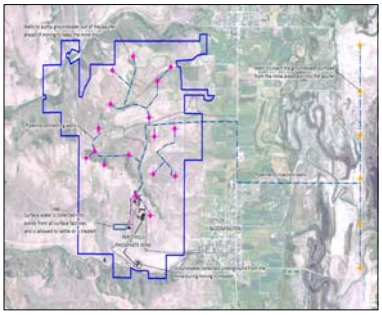
Block Representation of Numerical Dewatering Model





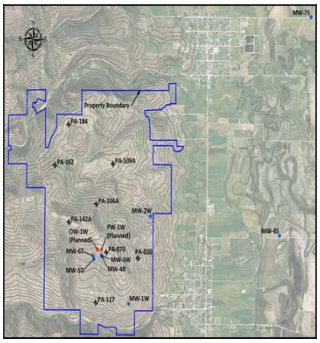
PARIS HILLS AGRICOM INC.

Water Management



PARIS HILLS AGRICOM INC.

Groundwater Monitoring Network

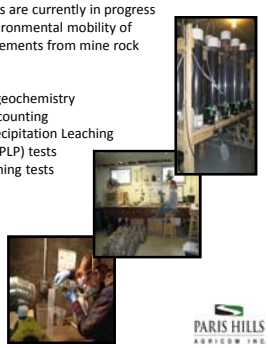


PARIS HILLS AGRICOM INC.

IDEQ – Point of Compliance (POC) monitor well locations will be determined at a later date

Reclamation Planning & Geochemistry

- Geochemical studies are currently in progress to evaluate the environmental mobility of metals and other elements from mine rock
- Tests include:
  - Whole rock geochemistry
  - Acid base accounting
  - Synthetic Precipitation Leaching Procedure (SPLP) tests
  - Column leaching tests

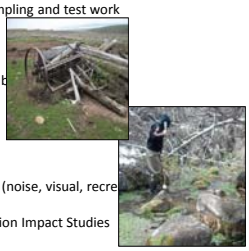


PARIS HILLS AGRICOM INC.

Environmental Studies

PARIS HILLS AGRICOM INC.

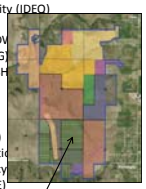
- Surface and groundwater sampling
- Flow monitoring of Paris and Bloomington creeks, gain & loss survey
- Rock geochemistry sampling and test work
- Cultural resources
- Wildlife and migratory b
- Sage-grouse habitat
- Wetlands delineation
- Aesthetic assessments (noise, visual, recre
- Traffic and Transportation Impact Studies



Permitting

PARIS HILLS AGRICOM INC.

- Permit approval expected for mining on state and private ground in 4th quarter of 2014
- Permit approval expected for mining on federal minerals in 2019
- Permitting Agencies:
  - Bear Lake County
  - Idaho State
    - Department of Environmental Quality (IDEQ)
    - Department of Lands (IDL)
    - Department of Water Resources (IDW
    - Department of Fish and Game (IDFG)
    - State Historic Preservation Office (SH
    - Transportation Department
    - Public Utilities Commission
  - Federal
    - Bureau of Land Management (BLM)
    - Mine Safety and Health Administrati
    - US Environmental Protection Agency
    - US Army Corps of Engineers (USACE)
    - US Fish and Wildlife Service (USFWS)



Federal Minerals

Permitting Timeline

PARIS HILLS AGRICOM INC.

- Permits needed before construction include:
  - Mine Infrastructure (buildings, roads, rail load out, utilities)
  - Operations and Reclamation Plan
  - Transportation
  - Water
  - Air
  - Other
- Initial construction expected in 4th quarter of 2014
  - Initial dewatering and injection wells
  - Mine portal
  - Access roads
  - Stockpile/crusher area
  - All other surface facilities construc
- Initial mining expected in early 2015

PARIS HILLS
AGRICOM LTD.

Overview of the Hydrology of the Paris Hills Phosphate Mine Project for the Bear River Commission

November 19, 2013

Introduction

- Scott Effner, P.G, Principal Hydrogeologist / Geochemist, Whetstone Associates
  - Based out of Gunnison, Colorado
  - Specializes in mining hydrology and geochemistry
  - 24 years experience, 15 in the SE Idaho Phosphate District
- Involvement with the Paris Hills Phosphate Mine Project
  - Starting in 2011
  - Responsible for:
    - Preliminary hydrogeologic investigation and groundwater modeling for the mining feasibility study
    - Baseline water resources monitoring program
    - Baseline geochemical characterization program
    - On going studies to support the design of mine dewatering and re-injection of groundwater

2

Paris Hills Phosphate Mine Project

- Project Overview
- Surface Water Hydrology
  - Lakes, streams, and springs
  - Baseline monitoring
- Geologic Setting
- Groundwater
  - Aquifer systems
  - Characterization studies
- Mine Dewatering and Water Management
  - Dewatering approach and pumping requirement
  - Re-injection of pumped groundwater
- Ongoing Studies
- Questions

3

Paris Hills Project Overview

- Located in the foothills of the Bear River Range, Bear Lake County, ID
- Underground phosphate mining project
- Positive feasibility study completed in December 2012
- Permitting studies and applications to begin mining are expected to be complete in summer 2014
- Mining operations are expected to start in fall 2014
- 19 year mine life with up to 326 people employed at the peak in year 8

4

Paris Hills Project Overview

- Project will recover 16.7 mt of ore from the lower phosphate zone near the base of the Meade Peak Member of the Phosphoria Formation by room and pillar mining methods using continuous miners followed by retreat mining with 60% pillar extraction.
- Preliminary estimates indicate that the peak dewatering requirement for the underground workings may approach 36.7 cfs (≈16,000 gpm). Hydrogeologic studies to refine the dewatering estimate are ongoing.
- Pumped groundwater to be re-injected into the basal conglomerate of the Salt Lake Formation.

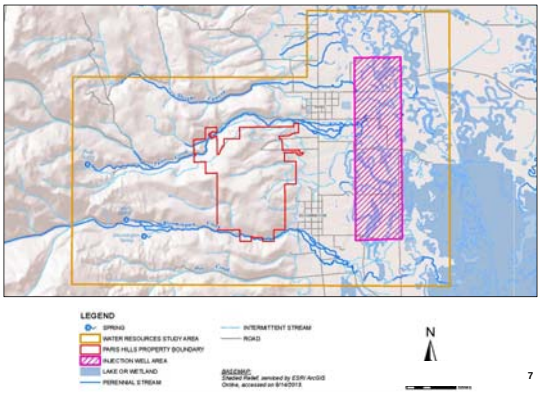
5

Paris Hills Project Overview

- Direct-ship rock, no processing or tailings facilities on site.
- Rock will be transported by highway truck and rail to local and distant markets.
- Small mine rock storage facility to be located on site (up to 1.5 mt).

6

Project Area and Re-Injection Well Field



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Surface Water

- Project Is located in the Bear Lake sub basin (HUC 16010201)
- Major surface water features in the region include:
  - Bear Lake
  - Bear River
- Surface water features near the Project include:
  - Paris Creek
  - Bloomington Creek
  - Little Canyon
  - Jarvis Spring
  - Bloomington Spring
  - Paris Spring
  - A number of small shallowly circulating springs

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Surface Water Monitoring

- Began in 2010
- 18 stations monitored 4 times annually for flow and water quality
- Monitored water bodies include:
  - Paris Creek
  - Bloomington Creek
  - Little Canyon
  - Jarvis Spring
  - Bloomington Municipal Spring
  - Paris Spring
  - Several shallowly circulating springs in the Project Area

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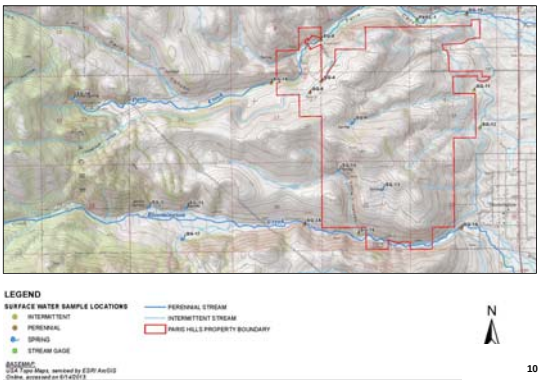
Surface Water Monitoring Network



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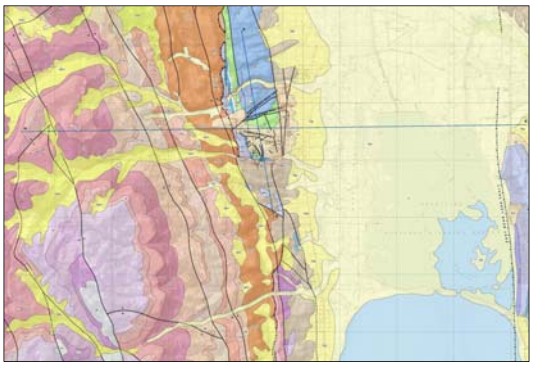
Geologic Setting



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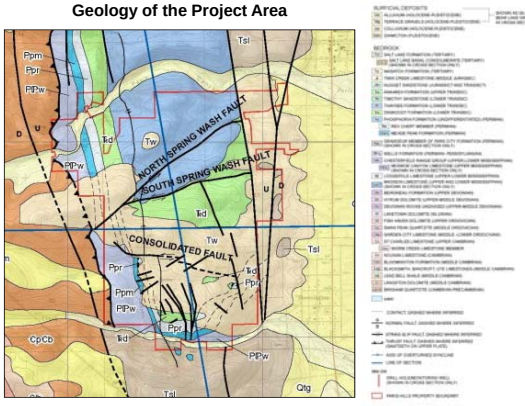
Geology of the Project Area



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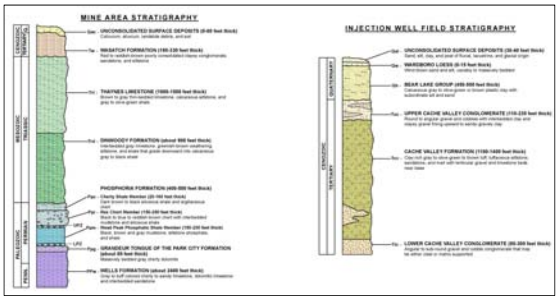
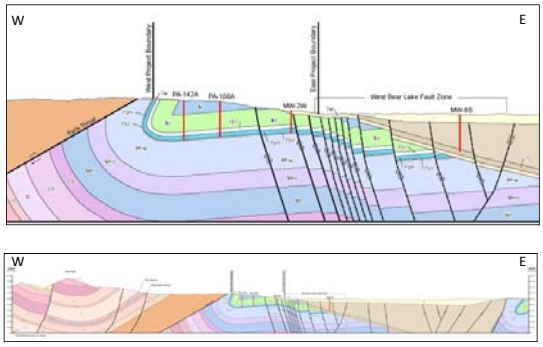
Project Stratigraphy



13

East-West Cross Sections Through Project Area



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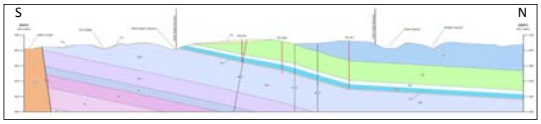
North-South Cross Section Through Project Area



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Hydrogeologic Characterization

- Began in 2011
- 21 packer permeability tests in 4 exploration boreholes
- Installation and monitoring of vibrating wire piezometers in 8 exploration boreholes
- Installation, testing, and monitoring of 8 wells.
- Geophysical characterization of re-injection well field area (in progress)
- Aquifer test in mine area (in progress)
- Numerical modeling of groundwater flow (preliminary model complete, updated model in progress)

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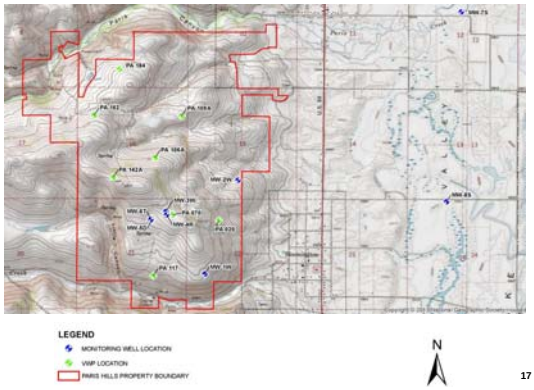
Groundwater Monitoring Network



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Mine Area Hydrogeology

- Perched water and local- to intermediate-scale flow systems in unconsolidated deposits and bedrock above the Phosphoria Formation. Generally these units are low permeability aquifers that are not well connected to regional ground water levels.
- Intermediate-scale aquifer system In the Rex Chert. Moderate to high permeability where fractured.
- Aquitard formed by low permeability shale and mudstone of the Meade Peak Member of the Phosphoria Formation.
- Regional-scale flow system in the Grandeur Tongue and Wells Formation. Moderate to high permeability where fractured.

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Mine Area Hydrogeology

- Northwest flow direction in Rex Chert and Wells Formation parallel to regional folding.
- Water levels in Rex Chert and Wells Formation are roughly similar near 5,970 feet elevation with an indicated downward gradient of approximately 0.01 ft/ft.
- The elevations of Paris and Bloomington Creeks are about 150 to 275 feet above the groundwater elevation in the Rex Chert and Wells Formation
- The elevations of Paris, Bloomington, and Jarvis Springs are about 6,564, 6,264, and 6,324, respectively

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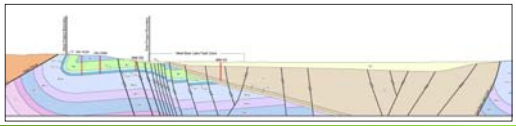
Re-Injection Well Field Hydrogeology

- Pumped water to be injected into the basal conglomerate of the Salt Lake Formation
- Depth of injection is approximately 2,000 feet below ground surface.
- Thick sequence of clay-rich volcanic and sedimentary rocks above the planned injection horizon.
- Basal conglomerate is underlain by clay-rich rocks of the Wasatch Formation.
- The basal conglomerate is under artesian pressure in the re-injection well field areal (about 45 feet of head above ground surface).



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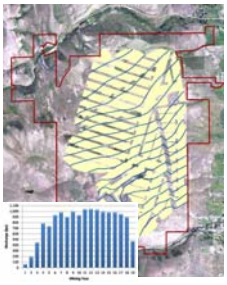
Mine Dewatering

- Underground workings will be submerged by up to 2,500 feet (750 m) at northern extent of mine.
- Numerical modeling for the feasibility study indicated that pumping from up to 17 wells will be required to adequately dewater the underground workings.
- Pumping requirements increase as mining moves down dip to the north. The maximum predicted pumping rate is 36.7 cfs (≈16,500 gpm or ≈1,040 lps) during mining year 12.
- Drawdown effects will propagate north and south parallel to the fold axis and will have limited ability expand east and west because of structural offset and truncation of bedding.



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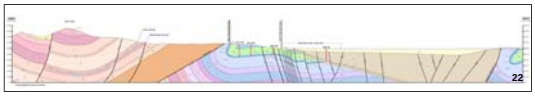
Mine Dewatering

- The Brigham Quartzite and Lead Bell Shale are expected to be effective barriers that limit expansion of drawdown impacts to the west and protect high discharge spring flows that issue from Paleozoic limestone and dolomite.
- Elevations of Paris, Bloomington and Jarvis springs are about 300 to 600 ft. higher than the regional water level in the Wells Formation indicating that the spring systems are not well connected to the aquifer in the mine area.
- Elevations of Paris and Bloomington creeks are about 150 to 275 feet above the water level in the Wells Formation which indicates that the streams are not in direct hydraulic connection with the aquifer.
- Drawdown impacts are not expected to surface water or shallow groundwater in Bear Valley east of the mine because of the thick sequence of clayey deposits.



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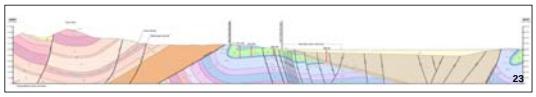
Re-Injection of Pumped Groundwater

- Injection area east of mine in Bear Valley.
- Targeted injection horizon is the basal conglomerate of the Salt Lake Formation at a depth of approximately 2,000 ft. below ground surface.
- The basal conglomerate is underlain by clay-rich sedimentary rocks of the Wasatch Formation which are expected to prevent recirculation of the water back into the underground mine
- Baseline groundwater data indicate that the quality of the pumped water will be similar to that of the receiving water.



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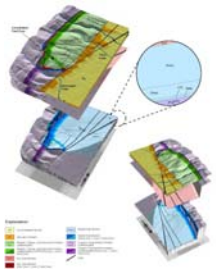
Ongoing Studies

- Baseline monitoring of groundwater and surface water
- Aquifer test in Wells Formation to better evaluate mine dewatering requirements
- Geophysical study to evaluate the thickness, depth, and lateral extent of basal conglomerate of the Salt Lake Formation
- Numerical modeling of mine dewatering, re-injection, and potential for mobilization of contaminants in groundwater
- Mine rock characterization studies



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Bear River Watershed Conservation Area

Briefing for Environmental Assessment and Land Protection Plan

Idaho – Utah - Wyoming

Why Establish a Conservation Area in the Bear River?


Bear Lake NWR/USFWS


Oxford Slough WPA/USFWS

Water is the lifeblood to sustaining 3 refuges & 1 WPA


Cokeville Meadows NWR/USFWS

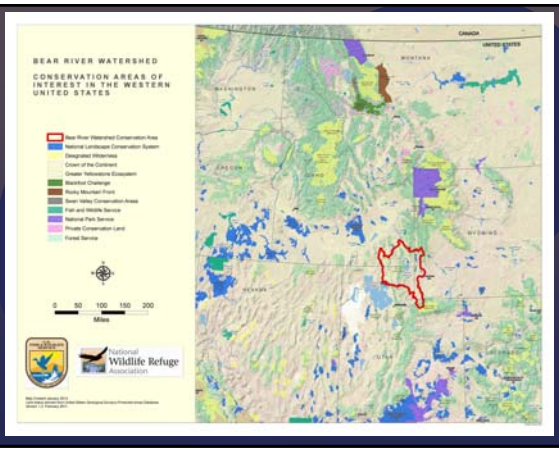

Bear River Migratory Bird Refuge/USFWS

Similar issues and opportunities for the three National Wildlife Refuges and Waterfowl Production Area in the watershed led to initial discussions about landscape-scale conservation.

Bear River Watershed Conservation Area

Landscape-scale Partnerships- A new refuge paradigm nationwide through collaborative conservation:

- Landowner interest in conserving their ranching heritage and wildlife values of the area
- Opportunity to collaborate with partners' ongoing conservation efforts in the watershed
- Three Landscape Conservation Cooperatives (Great Northern, Southern Rockies, Great Basin)
- Beyond the Boundaries (NWRA) Leadership - DOI, FWS, Region 6 & Region 1
- Bear River - ecologically and politically significant



Bear Lake, Bear River, and Cokeville Meadows National Wildlife Refuges:

- 10 Bird Habitat Conservation Areas within the Bear River Watershed (IMWJV)
- Pacific and Central Flyways crossover
- 8 Important Bird Areas (Audubon)
- Western Hemisphere Reserve Network (BRMBR)


Photo Credit: USFWS

Bear River watershed habitat supports:

Wetland Birds

- White-faced ibis (46% of the North American breeding population)
- Black-necked stilt (over 18% of the North American breeding population)
- American avocet (over 16% of the North American breeding population)
- Marbled godwit (over 24% of the North American migratory population)
- Tundra swan (32% of the western migratory population

Upland Birds

- Greater sage-grouse, sage sparrow, sage thrasher, Columbian sharp-tailed grouse, burrowing owl, and long-billed curlew –all are among 46 species Greatest Conservation Need (Idaho, Utah and Wyoming)

Bear River watershed habitat supports:

Mammals-100 species

- Numerous wide-ranging mammals are dependent on the large blocks of intact habitat, wintering areas, and key migration linkages including: elk, mule deer, moose, pronghorn, grizzly bear, Canada lynx, gray wolf, and wolverine.

Amphibians- 11 species of frogs and toads and 1 salamander (7 are species of GCN)

Reptiles- 20 species (15 are species of GCN)

Fish- 15 species.

- Bear River is identified by all three state comprehensive wildlife strategies as playing a critical role in providing habitat for native cool and cold water fish species, most notably the **Bear River Bonneville cutthroat trout**

Challenges and Threats to the Bear River Watershed

Development:

- Cache County, UT has population increased 64% since 2000, to double again by 2050
- Lincoln County, WY has grown by 24% since 2000
- Bannock County, ID has grown by 10% since 2000

Challenges and Threats to the Bear River Watershed

Potentially decreased water availability and quality due to demand increases and climate change:

- Groundwater aquifers will receive more demand, resulting in potential degradation wetlands and the 3 refuges.
- Climate change: Increased air temperatures (+5-6 deg. F), decreased snowpack and (10-15% decrease), 5-13 % decrease in run-off lead to lower base flows, higher stream temperatures and drying of riparian areas (2-4 wk spring melt).
- Existing agriculture irrigation rights could be converted for domestic and industrial uses within and outside the watershed, altering hydrology in the watershed.

BRWCA Serves as a Model for Strategic Habitat Conservation

Planning

- State Comprehensive Action Plans
- Wildlife Studies
- TNC CAP/Climate Change Model

Conservation design

- Bear River Watershed Study
- Biological Resources (focal species)

Implementation – Program delivery

- FWS conservation easements in collaboration with partners' ongoing efforts

Evaluation

- Outcome-based monitoring focal species, monitoring, other strategies
- Easement compliance

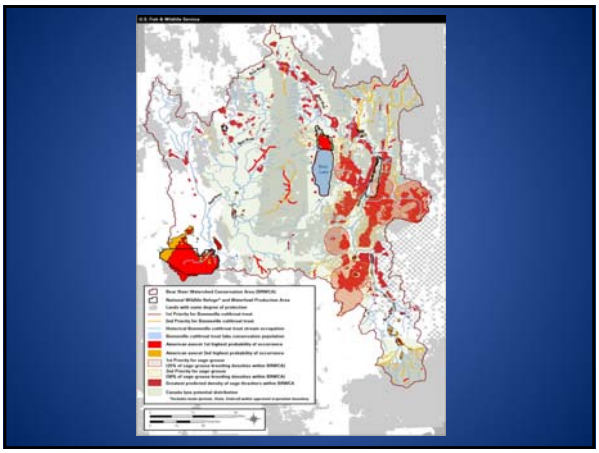
Conservation Design Planning

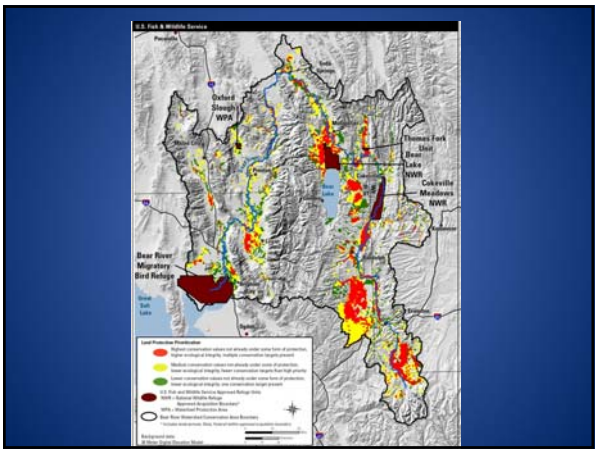
Habitat and Population Evaluation Team model of focal species:

- **American avocet** (white-faced ibis, greater sandhill crane-wetland)
- **Greater sage-grouse, sage thrashe**r, (sage sparrow-uplands)
- **Bonneville cutthroat trout** (leatherside chub, mountain whitefish, Utah sucker-riverine and riparian habitat)

Threatened and Endangered Species- relatively few species federally listed species reside in or have home ranges that overlap the BRWCA:

- **Endangered**: black-footed ferret
- **Threatened**: Canada lynx, grizzly bear, Maguire primrose, Ute ladies'-tresses,
- **Candidate**: greater sage-grouse, whitebark pine, yellow-billed cuckoo
- **Proposed**: wolverine, yellow-billed cuckoo





Conservation Easements

- Not allowed to erect, build or place any structures (no new surface occupancy: residential, mining, wind, transmission, oil and gas structures)
- Not allowed to sell or otherwise separate any of the water rights from the conservation easement areas.
- Landowners retain their rights (access, hunting) and responsibilities (payment of taxes, control of weeds)

Public Involvement

- Public meetings in ID, UT, WY held in 2011 & 2012
- Draft of EA & LPP out for public review: hundreds of public comments received
- Tribal letters of invitation sent
- Tours and meetings with local Congressionals
- Teleconference with partners, stakeholders, and various NGOs
- Idaho Tour with (ID F&G, ID Farm Bureau, ID Congressional staffers, NGOs)

Conservation Partnerships

- Local landowners throughout the watershed
- Audubon Society, The Nature Conservancy, National Wildlife Refuge Association, Trout Unlimited, Ducks Unlimited, Wyoming Stock Growers Agricultural Land Trust, Wyoming Water for Wildlife, Friend of the Bear River Refuge, The Conservation Fund, Western Rivers Conservancy, Wyoming Landscape Conservation Initiative, Wyoming Wildlife and Natural Resource Trust Fund, Southwest Local Sage Grouse Working Group, Bear Lake Watch, Bear Lake Regional Commission, Little Bear Conservation Alliance, Sagebrush Steppe Regional Land Trust, Yellowstone to Uintas Connection, Pheasants Forever
- Conservation Districts: Franklin Soil and Water, East Box Elder, Lincoln County, North Cache, Rich County
- Highlands Cooperative Weed Management Association, Bear Lake County Commission, Box Elder County Commissioners, Bear River Watershed Council, Bear River Association of Governments, Utah Farm Bureau
- Wyoming Game and Fish Department, Idaho Department of Fish and Game, Idaho State Parks & Recreation, Utah Parks & Recreation, Utah Division of Wildlife Resources, Utah Department of Agriculture
- Natural Resource Conservation Service, U.S. Forest Service, Bureau of Land Management, National Park Service, Intermountain West Joint Venture
- Idaho State University, Utah State University
- Union Pacific Railroad, PacifiCorp

Letters of Support

- Idaho State Legislature, (Rep. Marc Gibbs)
- Idaho Department of Fish and Game (Director)
- Idaho Fish and Game Commission
- Bear River Watershed Council
- Box Elder County Commissioners
- Franklin Soil and Water Conservation District
- National Wildlife Refuge Association
- The Nature Conservancy (3 states)
- Letters from 4 private landowners
- PacifiCorp (Idaho and Utah)
- Utah Division of Wildlife (pending)

Next Steps

- Land Protection Plan decision document has been approved
- Ongoing outreach to tribes (14),other agencies, local governments, organizations
- Ongoing outreach by NWRA- building local support
- Implementation Team (Project leaders and PFW state coordinators)
  - **Develop conservation easement, use ranking criteria, work with willing landowners**

Conclusions

- Interested landowners
- Support of numerous partners
- Chance to keep common species common by addressing changes and challenges in the future
- Keeping water on the landscape for wildlife resources
- Outcome-based monitoring to ensure efficient conservation habitat management for trust species

It is the delivery of conservation in the right place at the right time!

"You cannot have landscape conservation without landscape conversation… these landscapes are fragile, but we have the people that have the passion, the heart to make change."

_ Jim Stone, Blackfoot Challenge Chairman and Partner

Photo Credit: Jim Stanford

Questions?

Photo Credit: Brian Ferguson

SUMMARY OF WATER YEAR 2013 BEAR LAKE OPERATIONS AND IRRIGATION ALLOCATION FOR 2014

Date	Hydrologic Information/Event	Contents (% of Full) Discharge (% of Normal)
10-01-12	Bear Lake Beginning Elevation - 5,915.90 ft.	881,841 af (62%)
11-09-12	Bear Lake Low Elevation - 5,915.50 ft. (see note 1)	854,751 af (60%)
	Rainbow Inlet Canal Discharge	69,800 af (27%)
	Bear River Discharge Below Stewart Dam	2,000 af
	Bear Lake Net Runoff (Computed Total Inflow less Lake Evaporation)	37,100 af (11%)
06-01-13	Bear Lake High Elevation - 5,917.20 ft.	970,690 af (68%)
	Outlet Canal Releases; 10/1/12-10/11/12; 10/31/12- 11/5/12; 5/12/13-5/19/13; 5/24/13-9/30/13	250,000 af
06-25-13	Outlet Canal Maximum Release - 1,570 cfs	
	Bear Lake Storage Release (see note 2)	209,000 af
09-30-13	Bear Lake Ending Elevation - 5,912.69 ft.	667,093 af (47%)
	Bear Lake Settlement Agreement "System Loss" Volume (see note 3)	20,900 af

Notes for Table:
1 - Low contents prior to start of storage.
2 - Includes storage releases made through October 11, 2012 for use by Bear River Canal Company, includes water released from Alexander reservoir for irrigation use that was replaced by water from Bear Lake from October 31 to November 5, 2012.
3 - Due to uncontrolled flow from (welcome) rain events. Whenever water flows below Cutler during the irrigation season any storage water in the system at Cutler is the first water out. Natural flow goes to irrigators.

Current Status

Bear Lake elevation as of November 17, 2013 was 5912.33 feet. The seasonal low elevation has not yet been confirmed, but will likely be 5912.32 which occurred November 16, 2013. The causeway is open and water is entering Bear Lake. The Bear Lake Outlet Canal is closed.

Alexander Reservoir Drawdown and Refill – Drawn down during irrigation season for irrigation purposes and refilled during irrigation season with the last foot refilled in late October.

Cutler Reservoir Drawdown – Began mid-October, will stay down until early 2014.

Scenario for 2014

Despite the reduction in water level at Bear Lake, the irrigation allocation could still be the maximum possible if spring runoff results in a spring maximum Bear Lake elevation above 5914.7, the elevation at which the allocation begins to be decreased. A full allocation for Irrigators is 245,000 AF less delivery losses for a total of 236,303 AF. Under a worst-case scenario, assuming a one-foot increase from the fall low, around 220,000 AF would be the irrigation allocation for 2014.