MEMORANDUM

TO: Members, Clark Fork Basin Water Management Task Force (Task Force)
FROM: Gerald Mueller
SUBJECT: Summary of the April 11, 2011 Task Force Meeting
DATE: April 12, 2011

Participants

The following people attended the Task Force meeting:

Task Force Members:

Caryn Miske	Flathead Basin Commission
Harvey Hackett	Bitterroot Irrigation District
Ted Williams	Flathead Lakers
Ross Miller	Mountain Water Company
Marc Spratt	Flathead Conservation District
Jim Dinsmore	Upper Clark Fork

Agency

Ann Schwend	Water Planner, Department of Natural Resources and Conservation (DNRC) Water Management Bureau
Bill Schultz	Reserved Water Rights Compact Commission

Public

Molly Smith	UM Department of Geography
Mark Reller	BPA
John Sinrud	Northwest Montana Association of Realtors

Staff

Gerald Mueller	Consensus Associates

Meeting Agenda

- Introduction
- March 7, 2010 Steering Committee Meeting Summary
- Updates
  - Task Force funding
  - 2011 Water Legislation
  - Other organizations.
- Scope of Work for Drought Research
- April 26, 2011 Water Supply Outlook Conference
- CSKT Compact Update
- 11KAF Pricing Methodology Brainstorm Session
- Workable Storage/Mitigation System Phase 1 Proposal
- Public Comment
- Next Meeting

March 7, 2010 Steering Committee Meeting Summary

No changes were made to the March 7 meeting summary.

Updates

Task Force Funding - Gerald Mueller reported that HB6, including a $63,000 Renewable Resources Grant and Loan Program grant to fund the Task Force for FY2012-13, passed the Montana House of Representatives. The House Appropriations Committee had amended the bill to provide the $63,000 grant amount requested by the Task Force. The Senate amended the bill to increase the total funding in the bill, but the amendment did not affect the Task Force funding. The amended bill will be considered on third reading in the Senate today. If it passes the Senate, the bill will return to the House for concurrence in the Senate amendments.

2011 Water Legislation - Gerald Mueller reviewed the status of the water bills in the current legislative session. The status is available on the legislative web site at:
http://laws.leg.mt.gov/laws11/law0203w$.startup.
He reviewed information on the following bills.

- HB24, Water marketing bill - Signed into law.
  - Applicant proposing to use water for aquifer recharge or mitigation need NOT specify information about:
    - Each person who will use the water and the amount of water each person will use;
    - The proposed place of use of all water by each person;
    - The nature of the relationship between the applicant and each person using the water; or each firm contractual agreement for the specified amount of water for each person using the water.
- HB28, Septic mixing zones - Signed into law.
  - Requires a drainfield mixing zone to be located wholly within the boundaries of the proposed subdivision or that an easement or, for public land, other authorization has been obtained from the landowner to place the proposed drainfield mixing zone outside the boundaries of the proposed subdivision where the drainfield is located.
  - A mixing zone may extend outside the boundaries of the proposed subdivision onto adjoining land that is dedicated for use as a right-of-way for roads, railroads, or utilities.
- HB433, Exempt well bill - Missed transmittal deadline and is dead.
- HB602, Exempt well study bill - Passed both House and Senate and on its way to governor.
  - Directs WPIC to study exempt wells, including:
    - Enforcement options for exempt wells to ensure that they do not exceed statutory limits or disrupt prior appropriation system;
    - MBMG ground water investigation program research results;
    - The adequacy of existing programs and tools for managing and mitigating the development of wells that would otherwise be exempt; and
    - The relationship between exempt wells in land use decisions, including the relationship between exempt wells and individual septic systems, the cost comparison of installing public water systems or extending existing water infrastructure, and the role of local governments in requiring alternatives to exempt wells;.
- SB8, Allow local governing body to require public water and sewer systems - Failed in Senate.
- SB36, Court fees and costs - Passed both House and Senate and on its way to governor.
  - If a final DNRC decision for a permit or a change in appropriation right is appealed to district court, the district court may award the prevailing party reasonable costs and attorney fees.
  - The district court may award costs or attorney fees incurred as a result of administrative proceedings.
- SB103, Signed into law.
  - Exempts from permitting a well or developed spring with a maximum appropriation of 350 gallons a minute or less for use in nonconsumptive geothermal heating or cooling exchange

applications if all of the water extracted is returned without delay to the same source aquifer and if the distance between the extraction well and both the nearest existing well and the hydraulically connected surface waters is more than twice the distance between the extraction well and the injection well.

- SB343, Aquatic invasive species bill - Senate Finance and Claims hearing on March 4.
  - Puts DA and DFWP in charge of program.
  - The departments may enforce quarantine regulations and measures:
    - Imposed by law or rule in an invasive species management area, including the mandatory inspection of any interior portion of a vessel that may contain water for the presence of an invasive species;
    - For isolation and decontamination of vessels upon or in which an invasive species is detected; and
    - Are appropriate to an emergency declared by the governor.
  - The departments shall develop generic strategic plans that may be tailored to various locations for implementation as needed to prevent the introduction of invasive species and to control and, when possible, eradicate an invasive species.
- HB621, Revise aquatic invasive species laws and provide appropriation - Passed the House, amended in the Senate and awaiting Senate action on 3rd reading.
  - Authorizes DFWP, DNRC and DA to adopt an aquatic invasive species strategic plan;
  - Directs DFWP, DA, and DNRC to implement education and outreach programs that increase public knowledge and understanding of prevention, early detection, and control of invasive species; and
  - Appropriates $398,000 from the state general fund to the three departments for the prevention and control of any nonnative, aquatic invasive species.

Question - Does HB24 authorize marketing as a new beneficial use of water?
Answer by Ross Miller - No, marketing has been a beneficial use, but prior to HB24 marketing had to be paired with a specific permit. Now a water right can be changed to marketing for mitigation without specific details about the person who will use the water and the amount of water each person will use; the proposed place of use of all water by each person; the nature of the relationship between the applicant and each person using the water; or each firm contractual agreement for the specified amount of water for each person using the water.

Question - How does HB24 preserve a water right?
Answer by Ross Miller - Prior to HB24, changing a water right to mitigation required ceasing the former water use. For example if the use was irrigation, the irrigation had to stop. Under HB24, an irrigation right can be changed to mitigation, and the water can be designated for marketing. The former use can be continued until the mitigation contract is completed. Thus irrigation stops only incrementally as the water is marketed for a period up to 20 years.

Comment - The Sheridan Conservation District is considering marketing its reserved water rights for oil well fracking.

Comment - I wonder how the incremental change will be enforced.
Response - This is one of the details that will have to be worked out under the new HB24 marketing provisions.

Comment - My understanding is that the aquifer on the west side of Billings is dependent on irrigation.
Response by Marc Spratt - On the west side of Billings the aquifer has dropped 30 feet as land has been taken out of agriculture production and used for housing developments. This drop is

due directly to not irrigating rather than canal leakage. The aquifer in the Stillwater has dropped 18 feet due to cessation of irrigation.

Comment by Gerald Mueller - As a result of SB343 and HB621, responsibility for developing and implementing an aquatic invasive species (AIS) control plan will be shared by the Departments of Fish, Wildlife and Parks (DFWP), Agriculture (DA)and Natural Resources and Conservation (DNRC).

Comment by Caryn Miske - Together, all of the AIS bills, appropriations and grants resulting from this legislative session may make available about $2.37 million for aquatic invasive species work.

Question - Do the bills include aquatic invasive species as noxious weeds?
Answer by Caryn Miske - Earlier drafts of HB621 did include aquatic invasive species as noxious weeds eligible for funding via the noxious weed management trust. However, weed districts opposed these provisions and they were removed from HB621. AIS funding will not, therefore, come from the weed trust.

Question - Under the AIS bills in this session, is a leader designated for AIS effort?
Answer by Caryn Miske - No, the three departments are supposed to collaborate. The assumption that DFWP will be responsible for mussels and DA for plants is too simplistic.

Comment - The program had a leader in the DA, but he was laid off.

Comment - A leader is needed. In Idaho, the department of transportation is designated the leader.

Question - Is the Montana Department of Transportation (MDT) part of the Montana AIS program?
Answer - SB343 and HB621 does not include MDT.
Answer by Caryn Miske - MDT has funded signs in the past. They should be part of the AIS program as commercial boat haulers are critical. The large boats hauled across state lines are most likely to be contaminated and are launched quickly when they reach their destination.

Question - Can peace officers enforce the program?
Answer by Caryn Miske - Yes, peace officers are included in the bill as enforcement entities.

Comment - MDT has weigh stations which would be logical places for check stations. However, check station personnel would then have a lot of responsibility, including looking for drugs as well as AIS.
Response by Caryn Miske - Notification is critical so that the commercial haulers can be checked.

Comment - The legislature has cut $1 million of Resource Indemnity Trust funding from the DFWP Future Fisheries Program in HB316. Unless this funding is restored, DFWP will have only$274,000 from license dollars for this program. Future Fisheries have been an important source of funding for local watershed groups for water leasing and fishery habitat projects. If HB316 dies, the $1 million would be restored and added to the license dollars.
Comment - The Future Fisheries Program has also paid for fish screens.
Response by Ann Schwend - This program has been an important source for on-the-ground projects.

Other Organizations - There were no reports from other organizations.

Scope of Work for Drought Research

Molly Smith reviewed the scope of work for her drought research that had been previously circulated to the Task Force. See Appendix 1.

Question - Are you proposing to define drought in terms of flow?
Answer - Flow might be one factor along with precipitation. The research would set forth a definition.

Question - What criteria would be applied to determine critical flow levels?
Answer - Again the criteria would be specified. They may include Endangered Species considerations and instream flow water rights.

Question - In considering drought, will you look at the basin as a whole or consider sub-basins?
Answer - I will have to consider the scale at which drought might be managed.

Comment - Flathead Lake and the Blackfoot sub-basin have existing drought plans.

Comment - In the Bitterroot, the people who discuss drought are not the ones who have to deal with it.

Comment - You should coordinate your research with Jesse Aber. He staffs the Governor's Drought Committee and has access to information about the Soil Water Index, the Palmer Drought Index, the Pacific Decadal Oscillation (PDO), and other information.
Response - I have been in contact with him and will use him as a source of information in my research.

Comment - There is a difference between water shortage and drought. When storage is available, drought in the form of lower levels of precipitation may not be an issue.

Comment - You may want to review Climate and Man, a 1942 year book.

Question - Where will you start compiling a list of organization and individuals to consult in your research?
Answer - I plan to start with consulting the Task Force.

Comment - You may wish to look into city planning and landscape requirements in considering the effect of drought. Local government landscape permits may set water use requirements.

Comment - The level of Flathead Lake fluctuations is critical to the interests of the Flathead Lakers.

Comment - Forest management is also critical to stream flow.

Comment - The economic impact of drought is an important consideration, but may be beyond the scope of Ms. Smith's research.

April 26, 2011 Water Supply Outlook Conference

Gerald Mueller passed out copies of and asked for Task Force member comments on a proposed press release for the April 26 water supply outlook conference which will be held at the Missoula Doubletree Hotel. See Appendix 2 below. He also passed out copies of the registration list to

date and asked that members who plan to attend please notify him so that the proper amount of food can be ordered. The conference will be free.

CSKT Compact Update

Bill Schultz, Reserved Water Rights Compact Commission Program Manager, provided the update on legislation related to the Commission's activities and its compact negotiations with the Confederated Salish and Kootenai Tribes (CSKT) and the federal government.

Legislation

HB49, which authorized $16 million of bonding to pay for water-related infrastructure projects on the Blackfeet Reservation, has passed with bipartisan support and has been signed by the Governor. The projects were provided in the Blackfeet Compact approved by the 2009 legislature. Two cleanup bills related to the Blackfeet (HB 79) and Fort Belknap (HB 58) compacts have also passed and approved. The Compact Commission budget as being considered by the Legislature has not changed since January. The budget has been cut by a total of 5%, including 4% personal services cut as designated in the governor's budget presented to the Legislature and an additional 1% cut added by the legislature at the start of the session. This reduction will result in loss of one-quarter FTE for a hydrologist.

Question - Was the budget cut targeted at salaries?
Answer - The 4% cut targeted salaries.

Question - Is the Compact Commission budget within the DNRC budget?
Answer - Yes.

CSKT Compact

Mr. Schultz discussed the following items related to the compact.

Claims Examination - One of the objectives of the compact shared by the negotiating parties is the protection of existing verified water uses on the Flathead Indian Reservation. The DNRC Water Resources Division is examining the 1,500 non-CSKT, pre-1973 water right claims on the Reservation. The on-Reservation claims examinations should be completed by June 1. Examination of some related claims off of the Reservation in sub-basin 76LJ will be completed after June 1. DNRC has also verified 220 post-1973 water right permits and changes on the Reservation.

Question - Is the claims examination more rigorous than the traditional adjudication?
Answer - No. The same claim examination process is used on the reservation as off the reservation.

Unitary Management - This compact will include an ordinance for joint state and CSKT water management on the reservation. No other tribal compact provides for joint management. Other Montana compacts provide for state management of state-based water rights and tribal management of tribal water rights. A draft unitary management ordinance is posted on the Compact web page at: http://www.dnrc.mt.gov/rwrcc/Compacts/CSKT/9-23-08%20revised%20draft%20CSKT%20ordinance_clean.pd. The ordinance will in effect be the Water Use Act for the reservation. The draft ordinance contemplates allowance for:

- Domestic well development;
- Expedited permitting process for heating and cooling wells;
- Providing for redundant wells for public water supplies;
- Providing for substitute wells;

- Providing an amnesty filing process for un-permitted wells ;
- Defining abandonment; and
- Providing for mitigation for new well development.

Draft Compact - A draft compact dated July 28, 2010 is also posted on the Commission web site at: http://dnrc.mt.gov/rwrcc/Compacts/CSKT/28Jul10PrelimDraftPublicRelease.pdf. Sections of the compact remain to be developed, including: Articles III - Tribal Water Right; Article IV D - Distribution of Water in Times of Shortage; Article V - Disclaimers and Reservation of Rights; Article VI - Contributions to Settlement; and provisions addressing Hungry Horse water. Tribal off-reservation or aboriginal water rights also have not yet been addressed.

Seepage Study - DNRC and the Tribes have completed a seepage study to guide Tribal water infrastructure investments.

Instream Flow - Seth Makepeace presented the results of CSKT's evaluation of instream flow on the Reservation at the March negotiation session. The study modeled wet, average and dry years using a variety of methods.

Next CSKT Compact Negotiating Session - The next session will be Wednesday, April 27 at 9 am at the KwaTaqNuk Resort. The session will include: an update on domestic wells as addressed in the draft ordinance and a presentation by the Bureau of Reclamation about water allocation in the Yakima basin.

Question - How will the compact address non-permitted wells?
Answer - We expect the compact to include an opportunity to make an amnesty filing for unpermitted domestic wells. A permitting process for new wells with mitigation is being discussed.

Question - Will the unitary management replace state water right processes?
Answer - On the reservation, yes. As noted above, a draft ordinance is available on the Compact Commission web site.

Question - Will the CSKT Tribal Council adopt the ordinance?
Answer - Yes. The compact, including the ordinance, will need the approval of the Tribal Council, the state legislature and the Congress. For other compacts, the ratification process has taken several years. For example, the Crow Compact was approved by the Montana Legislature in 1999. In November 2010, it was ratified by the Congress. The Crow Tribe ratified it by a tribal referendum in March 2011.

Question - Will the Compact include elimination of the position of the Bureau of Indian Affairs regarding water management?
Answer - I do not know.

Question - I believe that you said that DNRC is evaluating 1,500 water right claims. Does this number include water rights up to 1996, when the Montana Supreme Court shut down DNRC permitting on the Reservation?
Answer - Claims refer to pre-1973 water rights. From 1973 until the 1996 Supreme Court decision, DNRC issued water right permits.

Comments - I believe that I received some sort of notification from the Montana Water Court regarding on-Reservation water right claims.
Response - There have been communications between DNRC claims examiners and pre-1973 water right claimants.

Comments - I believe that I received notice regarding a claim for usage of less than 35 gallons per minute (gpm) and 10 acre-feet per year (af/yr).
Response - The 35 gpm and 10 af/yr levels specify a permit exemption for ground water development not for surface water usage.

Question - Will the Tribal aboriginal rights differ by basin?
Answer - None of the Parties have yet made a proposal for off-reservation water rights. The state is in the process of developing a proposal.

Question - Would the instream flows be year-round?
Answer - None of the Parties have yet made a proposal for off-reservation water rights. The state is in the process of developing a proposal.

Comment - Given the need of certain new permits to mitigate their use year-round, the year-round instream flow may be a significant constraint.

Question - What is the status of CSKT Treaty related issue remarks on Bitterroot basin water right claims?
Answer - No change in status that I am aware of.

Question - What is the state's approach to the Tribes' aboriginal, off-reservation rights?
Answer - The state is in the process of developing a proposal.

Question - Is the goal to complete the negotiation in 2013?
Answer - The goal is to bring a compact to the 2013 Legislature.

Question - Is the state talking to others besides the Tribes about compact issues?
Answer - The Federal government is a party to the negotiations. All negotiation sessions are open to the public with question and answer agenda item and public comment welcomed.

Question - Will the state vote on the compact prior to the Tribal Council?
Answer - The Tribal Council can approve elements of the compact as they are developed. The state hierarchy is also considering them. Ultimately, the state, the tribes and the federal government must approve the compact. Historically, the federal government has approved the compact last because they usually include significant federal funding.

Question - Are there precedents for aboriginal treaty rights?
Answer - Yes.

Question - Would the Supreme Court stay on permitting on the Reservation be lifted when the state ratifies the compact?
Answer - Ciotti (Supreme Court case) does not apply once the Tribes reserved water right claims are settled.

Question - Are the negotiating parties compelled to complete the negotiation?
Answer - Completing the negotiation is a goal of the parties.

Question - Given the length of time that ratification by all parties may take, could the compact be changed after the initial negotiation?
Answer - The draft compact includes withdrawal option language similar to other compacts.

11KAF Pricing Methodology Brainstorm Session

Gerald Mueller introduced this topic. At the February 7 joint meeting of the Task Force and the Upper Clark Fork River Basin Steering Committee, Compact attorney Jay Weiner discussed the state's proposal in the compact negotiations to set aside 11 kaf from natural flow or Hungry Horse water for lease from the CSKT to mitigate future domestic and municipal development. Mr. Weiner stated that the CSKT would be unlikely to set a price for this water in the compact. The compact might, however, specify a process for determining the price. Mr. Mueller asked for ideas about how to go about establishing a process or methodology for determining the price.

Prior to this meeting, Mr. Mueller had circulated to Task Force members property sale listings by the Bates, Sanders, Swan Land Company that included two senior water rights. One was for senior water rights on the Madison River. This listing price was $2,800,000 for 1,421 acre-feet of senior water rights on the West Fork of Madison River. According to the listing, the rights included two rights, each with a flow rate of 12.24cfs, with 1899 and 1900 priority dates. The listing also stated that these rights have been "banked" by the Montana Department of Natural Resources through a change of use process from irrigation to temporary in-stream flow. The listing price of the other water rights was $6,000,000 for 1,212 acre-feet on Tenmile Creek west of Helena. The price of water for these two sales is $2,000 - $5,000 per acre foot.

Comment - There have been water right transactions in Montana with higher per acre foot costs.

Comment - In the Bitterroot delivered water costs on the order of $1,200 - $1,500 per acre foot, assuming 3-4 acre feet of water per acre of irrigated land.

Comment - In some cases where ranches have been sold and the water rights separated from the land the water costs more than the land.

Comment - I know of two firms that are marketing water in Montana, WestWater Research, LLC and Lotic, LLC.

Comment - The Montana Water Trust, now the Clark Fork Coalition and Trout Unlimited have leased water for instream flows. It may be useful to try to develop a range of prices for water marketing transactions in Montana.

Comment - As a part of the settlement between the state and NorthWestern regarding Milltown Dam in the Natural Resources Damage litigation, there was at least one appraisal of the Milltown Dam water rights. The appraisal might provide interesting information about the value of water.

Comment - The hydropower utilities have conducted studies of the value of water for hydropower generation.
Comment - An issue related to the CSKT compact would be whether the 11 kaf set aside would be used to generate revenue or would be available at a "cheap" cost to facilitate development.

Next Steps - Those members of the Task Force present at this meeting agreed that Mr. Mueller should invite WestWater Research and Lotic to make a presentation about its water marketing efforts at the next Task Force meeting. Also, Mr. Mueller should seek to obtain the Milltown Dam water rights appraisal from the Natural Resources Damage Program and/or NorthWestern, if it is available.

Workable Storage/Mitigation Phase 1 Proposal Concept

Marc Spratt discussed this topic using a PowerPoint presentation entitled "Potential Peak Flow Management within the Clark Fork Basin, Montana." This presentation is available on the Task Force web page at: http://dnrc.mt.gov/wrd/water_mgmt/clarkforkbasin_taskforce/default.asp. Excerpts from the presentation follow.

Issues

- Clark Fork Basin needs water for future users
- Providing for the long-term sustainable use by the various competing existing users
- Existing storage is, or will soon be, fully utilized
- Mitigation potential of existing supplies may be limited – can Flathead water mitigate new uses in the Upper Clark Fork?

An aquifer is an underground reservoir of water contained by rock or unconsolidated materials (gravel, sand, silt or clay), from which groundwater can be extracted. In 'managed aquifer recharge' a water source, such as recycled water (e.g. derived from urban stormwater or treated sewage) or natural water (eg from a lake or river), is used to 'recharge' an aquifer with water under controlled conditions. The aquifer is used to store surplus water for later use or for environmental benefit.

In Montana we have "Accidentally Managed the Recharge" since irrigation began. With managed recharge we are suggesting intentional aquifer management.

Potential "New" Sources

- Conservation – use less, frequently viewed as reduced diversions
- Increase surface storage – expand existing dams, build new ones.
- Increase groundwater storage – manage recharge (Aquifer Storage & Recovery)

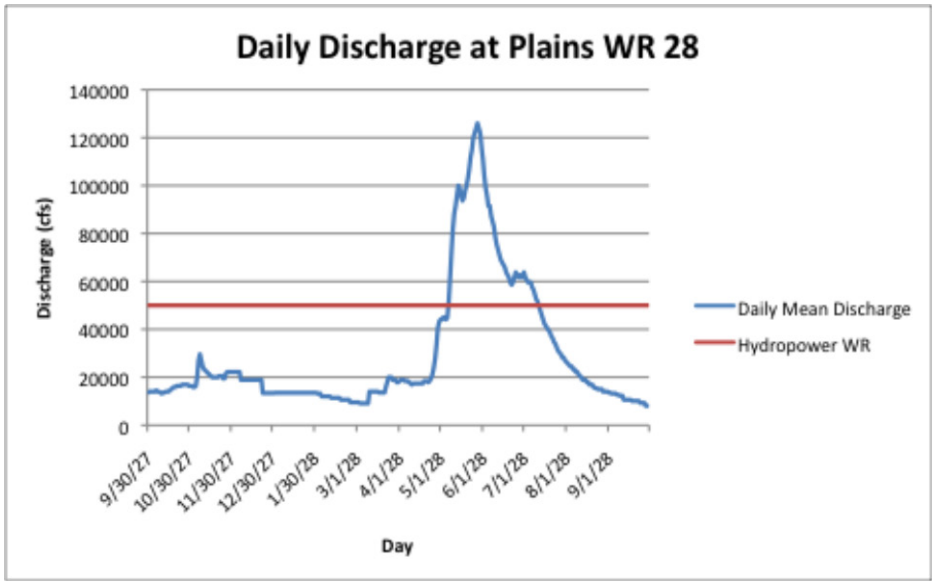
Project Area - Clark Fork River Basin
Annual Runoff - 14,040,000 AF
Average Annual Q - 19,390 cfs
Lowest Daily Mean Q - 3,200 cfs
Highest Daily Mean Q - 133,000 cfs
59% of Annual Clark Fork Basin Discharge from Flathead River

Benefits of ASR

- May reduce the need to construct large and expensive surface reservoirs.
- ASR systems can store very large volumes of storage at a fraction of the economic and environmental costs of surface storage systems.
- ASR systems are considered to be more environmentally friendly than surface reservoirs.
- Offer more protection from tampering.
- ASR may restore and expand the function of an aquifer that has experienced long-term declines in water levels due to heavy pumping necessary to meet growing urban and agricultural water needs.
- Can be geographically dispersed.
- ASR systems also avoid the evaporative losses associated with surface reservoirs and are less vulnerable to contamination.

Project Goals
- Provide Flood control through headwaters storage
- Reduce flow during periods of oversupply of wind power
- Reduce spill at hydropower facilities
- Increase storage for potential appropriation, and mitigation

Water Availability



Spill = 4.1 million ac-ft in WR1928

Project Plan

Phase I will:
- Assess where flood control relief is needed within the basin.
- Identify potential locations for water storage, either surface or groundwater.
- Estimate the rate at which water might be stored.
- Prepare a preliminary assessment of hydrologic feasibility:
  - Can sufficient water be diverted to affect surface water flows?
  - Can water be "injected" through any means at a sufficient rate to capture surplus flows?
- Coordinate with various permitting & water resource management agencies.

80-100% of water injected in an aquifer storage and recovery system can be recovered. However, aquifer capacity drops by about 80% after land subsidence occurs.

Question - Can you set up a recording system to measure the amount of water injected?
Answer - Yes, using a series of monitoring wells.

Comment - If infiltration is used to store the water, you have to be conscious of saline seep.

Question - Must water be treated before it is injected into an aquifer?
Answer - Whether it is treated and the amount of treatment depends on the quality of the surface water being injected and of the ground water in the aquifer. Regulations do not allow injection to degrade the quality of ground water.

Question - Will the study look at using lakes such as Echo Lake and unused reservoir capacity to store peak surface flows?
Answer - Yes.

Comment - In the upper Clark Fork, peak flows are stored now in both reservoirs and in the ground through flood irrigation.

Comment - In the Flathead, every 10 years we have a large recharge event.

Comment - One of the benefits of the Task Force efforts in this area might be getting water management into water law.

Public Comment
There was no additional public comment.

Next Meeting
The next meeting is scheduled for 9:30 a.m. on Monday, June 6, 2011 at the Mountain Water Company Office in Missoula.

Appendix 1
AN INVESTIGATION OF DROUGHT CLIMATOLOGY, VULNERABILITY, AND MITIGATION IN THE CLARK FORK RIVER BASIN OF MONTANA

Proposed Scope of Work

Molly Smith
Department of Geography
The University of Montana

OBJECTIVES / TASKS

- To synthesize scientific constructions of drought.
    - Past: construct a history of the severity and frequency of drought in Western Montana.
    - Present: What are critical flow levels? Where are there flow requirements/Murphy rights?
    - Future: evaluate & recommend tools for predicting drought.
- To assess human perceptions and experiences of drought.
    - Interview key informants:
        - How do you/your constituents respond to low flows/drought?
        - What is your definition of low flows/drought?
        - How could long term/increased frequency of drought be managed?
- To assess basin-scale approaches to drought management in regions with similar population, scale, and aridity parameters.
    - Develop case studies of drought management plans
        - What are the key components?
        - How could these case studies be adapted to fit the Clark Fork River?

DELIVERABLES

- Written assessment that can be posted on the Task Force website.
- Presentation of findings at a Task Force meeting.

TIMELINE

Spring 2011 – Write thesis proposal. Develop interview questions and list of key informants.

July & August 2011 – Conduct interviews. Develop case studies.

Fall 2011 – Process interview material. Preliminary presentation of findings (?).

January 2012 – Write, write, write.

February 2012 – First draft of thesis/drought assessment.

May 2012 – Defend thesis & graduate.

_____ - Task Force develops drought management plan for the Clark Fork River Basin.