Utah Lake Technical Committee Meeting
Monday, February 25, 2008, 8:30 A.M.
Historic Utah County Courthouse, Suite 212
51 South University Avenue, Provo, Utah

ATTENDEES:

Greg Beckstrom, Provo, Vice-Chair
Reed Price, Utah Lake Commission
Rick Cox, URS, Inc.
Bob Fisher, Woodland Hills
Deon Giles, Pleasant Grove
Lee Hansen, Saratoga Springs
Jim Hewitson, Lehi
Ty Hunter, DNR-Div. of Parks and Recreation
Terry Johnson, U.S. Army Corps of Engineers
Chris Keleher, Dept. of Natural Resources
Ann Merrill, DNR-Div. of Water Resources
Carol Mausser, Executive Assistant
LaVere Merritt - Consultant
Michael Mills, JSRIP
Clyde Naylor, Utah County
Douglas Sakaguchi, DNR-Div. of Wildlife Resources
Gene Shawcroft, Central UT Water Conservancy District
Brad Stapley, Springville
Sarah Sutherland, Central UT Water Conservancy District
Chris Tschirki, Orem
H. Barry Tripp, Forestry, Fire & State Lands
Dave Wham, Dept. of Environmental Quality

ABSENT:

Bruce Chesnut, Orem, Chair
Scott Bird, Mapleton
Don Blohm, Highland
Adam Cowie, Lindon
Howard Denney, American Fork
Norman Holdaway, Vineyard
James Linford, Santaquin
Michael Vail, Genola

1. Welcome and Introductions.

The meeting was called to order by Vice Chair, Greg Beckstrom at 8:37 A.M. Vice Chair Beckstrom introduced himself and informed the Committee he would be conducting the meeting with Chair Bruce Chesnut out of town. He requested that all present introduce themselves and state what organization they are representing. Introductions were made. It was acknowledged that Michael Mills is the new representative for the June Sucker Recovery Implementation Program (JSRIP). Terry Johnson was welcomed as the new representative for the U.S. Army Corps of Engineers.

2. Review and approve the Utah Lake Technical Committee minutes from January 14, 2008.

Discussion was opened regarding the minutes from the January 14, 2008 Technical Committee meeting. Chris Keleher had some corrections regarding the affiliations of two of the members. Mr. Keleher should be listed as Chris Keleher, Department of Natural Resources and Doug Sakaguchi should be listed

as DNR- Division of Wildlife Resources. Also there was a grammatical error that was corrected. It was moved and seconded to approve the minutes with those corrections. The minutes were approved.

3. Master Plan—Review Progress.

Vice Chair Beckstrom introduced Rick Cox from URS, Inc. Mr. Cox was invited to give a brief outline of the status of the Master Plan process. Mr. Cox stated that the Master Plan process has started and URS is in the process of collecting information of existing reports and large GIS map coverages. He requested that anyone should forward to them any existing information that they feel URS should have to study. The next step in the process is to finish looking at the existing data and then URS will be calling all the Subcommittees of the Technical Committee and reporting to them. Following that there will be an Existing Conditions Report along with prepared Existing Conditions Maps that will be used for public involvement at the Public Open Houses which will be held the beginning of April. Then there will be Subcommittee meetings and in mid-April there will be a Visioning Workshop to which all the Technical Committee members will be invited.

Mr. Price stated that the date for the Visioning Workshop is calendared for Friday, April 18th. Representation from the Technical Committee, Governing Board and Subcommittees will be needed at the Workshop. The Workshop will begin at about 9:00 A.M. and continue until 3:00. There is a possibility that it will be held at the Provo Library but other venues and possibly another date may be considered.

Mr. Beckstrom stated that in the next seven weeks individual committee members may be hearing from members of the URS planning group soliciting information for building the Existing Conditions Maps and Report which are anticipated to be completed in late March. Those will then be circulated among the Technical Committee members and the Subcommittees members. There will be subcommittee meetings that will be held to help bridge the Existing Conditions Report and the Visioning Workshop. It is anticipated that those will be held around the first week of April. There will be opportunity for feedback on the Existing Conditions Report and the Visioning Workshop. There are also some tentatively scheduled Public Open Houses. One will be held in Provo on Wednesday evening at Utah Lake Park and the second one is tentatively set to be held in the Lehi area on Thursday, April 3 in the evening at a location to be determined. Advertisements will be going out once the locations are solidified, hopefully this Thursday at the Governing Board meeting. Public notices will be going out soliciting public participation. Mr. Price will check with Ty Hunter to make sure the State Park is available.

Mr. Beckstrom commented that the busy time period of the Master Plan schedule is approaching and expressed appreciation to Mr. Cox for his work and leadership. At this point in time there are not a lot of visable results but a lot of work is going on and in the next five to eight weeks there will be visible results of these labors.

Mr. Beckstrom invited any questions regarding the Master Planning process. Mr. Hewitson inquired about the dates of the Open Houses. The time frame will probably from 6:00 – 8:00 P.M. and will be discussed and confirmed at the Governing Board meeting.

4. Phosphorus Investigation on Utah Lake.

Reed Price reviewed for the Committee that the Department of Environmental Quality (DEQ) is almost done with a final document to release the results of the findings of the TMDL report which investigated phosphorus and total dissolved solids (TDS) exceedances in Utah Lake. Several months ago Dr. Lee Hansen from Saratoga Springs who is a retired professor of Chemistry at Brigham Young University took it upon himself to do some phosphorous studies. Mr. Price invited him to report to the group what he has been doing and what was discovered in regard to the phosphorous condition of Utah Lake.

Dr. Hansen said that the task he set out to do with his team was to identify what the general phase of phosphates is in Utah Lake that control the concentration of phosphorus in regard to water quality. What they were looking for was a specific mineral phase of phosphate precipitates. They didn't find that, but what they did find was calcium carbonate, calcite, quartz and clays. In Mud Lake they also found iron pyrite which is no surprise with the corrosion of the sewage treatment plants. It was asked what area is considered as Mud Lake. Provo Bay is actually also referred to as Mud Lake by many of the local citizens explained Ty Hunter. Chris Keleher added that according to Robert Carter who wrote "Utah Lake: Legacy", Provo Bay was historically called Clear Lake.

Dr. Hansen continued saying that the first thing the team did was to identify the minerals in the lake samples that were taken. When the team identified the minerals and bottom sediments they did not find any phosphate minerals so the next thing they did was to analyze the water itself. What they found is that the lake water is super-saturated with respect to apatite which is a form of calcium phosphate. It's also commonly known that organic materials such as humic acids combines with it and thus prevents direct apatite precipitation. He suspects that's what is preventing apatites from forming.

They then went to another test using scanning electron microscopy to locate the phosphorous and see if it's correlated with any of the other elements. It turned out that the phosphate is absorbed either on or into (or both) calcium carbonate and the clays. It could be that phosphates are dispersed throughout the bottom sediments.

The next step would be to determine if the equilibrium between phosphate in the water column and phosphate in the sediments controls the phosphate concentration in the water. They are currently determining what that distribution is. Another question to be answered is: does phosphorous actually limit the algae blooms in the lake? The answer depends on how available phosphate is in the sediments. Another question they are considering is: if the phosphate input into the lake increases, will it reach the stage that it will overwhelm the ability of the sediment to absorb it? Furthermore, is it phosphate that is limiting the algae blooms in the lake or is it nitrogen or the light? The possibility of it being light is because the lake is so cloudy. Also, how are the fish and vegetation in the lake affected by the phosphorus?

Mr. Beckstrom reviewed that one of Dr. Hansen's tasks was to research whether or not additional phosphorous in the lake will exceed the phosphorous stabilization capacity of the bottom sediments. He asked that if they also will be looking to answer if the phosphorous levels in the lake are dramatically reduced will that change the free phosphate level in the lake or will the lake simply absorb the phosphates out of the sediments if the input is reduced in the inflowing water?

Dr. Hansen said they don't know the answer to the question yet. The phosphate may be locked up in those minerals in such a way that it's permanent or they may simply be there temporarily and go back into the solution when the water concentrations are low. They should be able to determine that when they see how difficult it is to extract the phosphate out of the sediment. According to the studies that Mr. Dave Wham conducted with the DEQ they found that about 2/3 of the phosphorous influent stays in the lake. This is not unusual in shallow water lakes.

LaVere Merritt stated that the studies that Dr. Hansen is doing are very informative and will give good information for the future. Because various areas in the lake are so different it's very difficult to trace the phosphorous pathways. Because of this type of difficulty, correlation models are often used and correlation models were applied to Utah Lake. The result is that the Lake is loaded by at least an order of magnitude higher than necessary to cause a eutrophic condition. The levels of both nitrogen and phosphorus that come into the lake are currently, and have been for a long time, at least an order of magnitude possibly ten to twenty times higher than what are needed to maintain a high-growth, hyper-eutrophic system. The outcome is that a huge reduction would probably make little difference in the algal growth in the Lake.

The understanding of the nutrient dynamics is useful but is not likely to answer the question as to the relationship between the nutrients and algae growth over a summer and fall. Those that have looked at the lake over a period of years think that even a large or significant reduction in phosphorous input to the lake might not make much difference as to the amount of algae that grows in the lake. However, that is still open to debate. It's not a conclusion, only a perspective.

Vice Chair Beckstrom asked Dr. Hansen how big a geographic area his analysis covered. Dr. Hansen replied that they took samples from five or six different locations. One of the samples they took essentially from the middle of the lake. That sample had more clay in it and less quartz. Dr. Hansen brought a sample of the lake water in a jar that was passed around. It was stated that the clays are largely being formed in the lake system itself.

Mr. Keleher asked if the June Sucker is limited by water quality as far as the phosphorous is concerned. Mr. Wham said that in concurrence with what Dr. Merritt stated, Utah Lake has to be looked look at as a whole system. That is how DEQ is trying to recover the June Sucker by restoring the ecosystem to the extent that it will sustain the species. He stated that he has some questions in regard to the water quality as well, such as whether the biological components in the system analysis are being considered. Also, if the carp are removed from the lake, how will that affect the aquatic vegetation?

Mr. Beckstrom asked Dr. Hansen how his work is being financed. Dr. Hansen replied that he has volunteer students doing the work.

Mr. Mills asked what the ratio is of nitrogen to phosphorous. Dr. Hansen replied that they don't have that yet, but will have it when the water analysis is completed. He added that that, of course, will only apply to the time and location that sample was taken in. Mr. Mills added that according to information he has read and received that when the nitrogen ratio is overwhelmed by phosphorous the type of algae (cynobacteria) that grow are less desirable and can become quite toxic.

Dr. Merritt confirmed the truth of that statement. Blue-green cynobacteria do tend to dominate when there is a relative shortage of nitrogen. Utah Lake is nitrogen limited on a long term basis. Yet, there isn't seen the persistent blue-green algae blooms that would normally be expected with low nitrogen levels. This is probably another clue that it might be more limited by light because the massive blue-green algae blooms that one might expect to occur under nitrogen limitation are not seen. Algae blooms are still seen and can get quite bad, particularly in protected areas where the water is clearer. But one doesn't see the massive blue-green blooms that would be expected when there are fairly high nutrient levels and the waters become nitrogen limited. In the mid to late summer occasionally there are large blue-green algae blooms, but they are not common. There is a worry that something could happen to trigger an increase in these blooms. That is still an issue to be answered with studies and analysis.

It was asked what an example might be that would trigger an increase. It was answered that possibly if the water got too clear you could have more of a problem. Dr. Hansen inserted that cyanobacteria might be favored by low nitrogen because they can fix nitrogen while green algae cannot. Mr. Wham said that blue-green algae also have the ability to move within the water column. These algae are more tolerant to UV light and that's why you can see masses on the surface of reservoirs where they can get the light they need to grow. They can move to optimum nutrient condition and light condition. Mr. Keleher stated that it was his understanding that in certain systems blue-green algae become more prevalent. Mr. Wham said that it is often the case when there is an excess of phosphorous load to a system it's not limiting but if you were to remove the phosphorous it could shift. Dr. Merritt commented that the ratio may not be meaningful because there is already an excess of both.

It was asked what kind of effect the carp removal would have on plant life. Mr. Wham said that this is a hard question with a complex inter-related system. In the shallow bay areas there would be less turbid conditions with an increase in aquatic plants. This would cause a shift from free floating algae to attached algae. That would contribute to a more balanced ecosystem. It would provide additional

habitat for all the fisheries and would also break the phosphorous cycling from the sediments caused by the carp. The carp dominance in the lake due to their feeding habits takes what might be bound phosphorous from the sediments and makes it biologically available phosphorous.
Mr. Cox questioned if the carp were removed and you had more aquatic vegetation would it potentially allow more phragmites to move in?
Dr. Hansen said there would be a lot of factors involved and they don't know the answer yet.
Mr. Wham stated some of the answers to these questions will be discussed in the final TMDL report. This summer the DEQ will be working with Dr. Ramesh Goel at the University of Utah who has worked with the Jordan River, Utah Lake and some other reservoirs. They will be looking at nutrient cycling in the lake sediments, doing both laboratory and in-situ studies including flux rates, extractions, and looking at bonding in iron aluminum, phosphorous, etc. They will continue taking 24-hour dissolved oxygen readings. They will also be conducting algal experiments including light and dark bottle studies to gain better understanding of light limitation for algal growth.
Dr. Hansen wondered if it might be worthwhile to do studies of the carp while fencing off sections of the Lake. Mr. Keleher commented that the June Sucker Program did do some cage experimentation on a small scale. They found that vegetation comes into those areas when carp are removed.
Dr. Merritt added that an interesting observation in earlier years when he was involved with doing some studies on Utah Lake. They took some samples of sediments and lake water and put them in the lab and used growth lights to simulate night and day and observed them to see what would happen. Within about two weeks time each one of the bottles had become its own ecosystem and looked quite different from the next one. The only conclusion he could draw from that was that there are so many different life forms involved that the ecosystem and its nutrient pathways are extremely complex and difficult to isolate.

5. Impact of Carp on Utah Lake discussion.

Mr. Price stated that the email he sent to the Committee members referenced a couple newspaper articles in the Deseret News and the Daily Herald. The articles were written after speaking to Dave Wham and Reed Harris. Apparently the reporter at the Daily Herald, Caleb Warnock, got a copy of the draft off of the website and wrote in his article that removing the carp in Utah Lake could be harmful. His rationale was if the carp are removed from the lake the vegetation returns allowing the sediments to settle making the lake clearer and thus, allowing the harmful algae blooms to occur. Mr. Price asked Mr. Wham to comment on the article.
Mr. Wham was extremely surprised when he read the article as he had spent about forty-five minutes on the phone with Caleb Warnock. What the article does not say is that the removal of the carp from the lake has been discussed at length and the de facto conclusion has been that carp removal is the best solution for the ecosystem of Utah Lake. Mr. Wham expressed that he didn't know what to say except that it seems as if the newspaper was looking for a sensational tagline.
Mr. Keleher stated that there are tons of life forms in the lake and one can anticipate things that will happen, but it's a complex adapted system. There are drivers that drive the system and one of those drivers is carp. In an ecosystem approach if one of the drivers is removed things are going to end up differently. There is a margin of uncertainty as to what that would be, but the scientific literature suggests and supports that the June Sucker will be revived if the carp are removed. In response to Mr. Price, he confirmed that, in his mind, an ecosystem with the June Sucker in it rather than the carp is a better system.
It was asked if the article should be refuted. Mr. Beckstrom added that the understanding he has is given the highly complex nature and the myriad of variables that are associated with the Utah Lake system that removal or significant reduction of carp from the lake, unilaterally agreed, will improve the

ecosystem. Not that there won't be some uncertainty but, everyone seems to agree, that the net positives will outweigh any negatives or risks. Conceivably there may be some increased risk with respect to algae blooms, but even with that, based on listening to experts the positives would still significantly outweigh the negatives. If someone feels differently about this or knows of someone who feels differently, he suggested that those views be expressed. He said that he felt the majority of the Governing Board agree with this solution.

Dr. Hansen interjected that it is not known if carp removal will improve the turbidity. However, it's not an irreversible situation.

Dr. Merritt asked if Provo Bay becomes more turbid in the summer. Ty Hunter answered that it is kind of a pea soup. It is clearer in the spring before the temperature warms up. There is a lot of boat activity in Provo Bay. There is a lack of wave action and so it is a coveted area for the water skiers. Dr. Merritt commented that his impression of Provo Bay is that it has always been a hyper-ecosystem that almost wipes its wildlife out with a severe winter. It's been his opinion that Provo Bay is often not more than an algae pond. It's always had a problem with fish being killed and been smelly and it's not about to change. Mr. Beckstrom asked if the skiers keep the fisherman away. Mr. Hunter commented that the fishermen are more in the shallow inlet areas. Sometimes there are catfish that get into that area.

Michael Mills stated that Utah State did a study in 2004 on radio-tagged carp. It was during a drought in the summer. When the conditions became unfavorable including such detriments as the lack of oxygen and temperature, it was surprising how quickly the carp left.

Mr. Beckstrom commented that it had been a beneficial discussion and had helped enhance some understanding of this issue. Mr. Jim Hewitson questioned whether or not there should be a response to the newspaper in regard to the article. There was discussion as to what channel to use to respond such as the DEQ, or the Commission, etc. Other suggestions were to have the Technical Committee send a response. It was also suggested not to respond directly to the article but to move forward with positive articles about the Master Plan and try to insert some comments in those stories. It was decided to focus on the visibility of the Master Plan and to give out positive information and avoid any distracting rebuttals.

Mr. Bob Fisher proposed that it be considered whether the Commission might want to hire a publicist in order to have more communication with the public. All inquiries and communication involving the public or the press should be directed to the Director of the Commission, Reed Price. Mr. Price commented that the Commission already has the publicist firm of Wilkinson-Ferrari as part of the consultant team for the Master Plan. They will be helping to organize the public meetings that are coming up.

Mr. Beckstrom asked Mr. Wham when the TMDL final report will be finished. Mr. Wham commented they had hoped to have it by the end of February, but it will take a little longer. They found that some things that were clear to them needed to be clarified in the report for the public. Some of the procedural issues, not the facts, need to be tuned.

Mr. Beckstrom asked what the status is for the report in regard to funding and what is scheduled next for further studies. Mr. Wham said they are working on securing funding. He also said he does have a draft of the TMDL study that anyone is welcome to peruse.

Dr. Hansen said he had been getting asked about the sewage plants and the status of them upgrading their procedures. Mr. Price answered that back in September the Technical Committee helped to draft a resolution which recognized the potential need for treatment plants to be required to upgrade. The Technical Committee recommended in that resolution that treatment plants plan ahead so they will be prepared to retrofit their equipment for phosphorous removal should it become required in the future. The Commission has supported, therefore, the idea of planning for the future. Mr. Beckstrom said it was his understanding that there will be no State requirements for phosphorous removal issue until further studies are conducted.

6. Other Business.

Mr. Price announced that it was somewhat hard for some of the Steering Committee members to get to the 7:30 A.M. meeting as they have to drive from Salt Lake City. He requested to move the Steering Committee meeting time up to 8:30 A.M. which would, in turn, move the Technical Committee meeting time up to 9:30 A.M. With that schedule anything current that comes up in the Steering Committee meeting will be able to be presented to the Technical Committee immediately following their meeting. This will continue only during the Master Planning period which will be for about six to eight months. All were in agreement. Mr. Price will send an email reminder to everyone involved.

7. Confirm that the next Technical Committee meeting will be held on Monday, March 24, 2008.

The next Technical Committee meeting will be held at 9:30 A.M. on March 24, 2008.

8. Adjourn.

Mr. Beckstrom thanked everyone for coming and the meeting was adjourned at 9:45 A.M.