



DATE: September 8, 2016

FROM: Provo Public Works

TO: James Harris, Utah Division of Water Quality (jamesharris@utah.gov)

RE: Provo City Public Works Response to Utah's 2016 Integrated Report

Provo City Public Works (Provo) appreciates the opportunity to comment on the Utah 2016 Integrated Report. Access to good quality water is vital to sustaining Utah's economy. Provo agrees with determining a technologically feasible and responsible level for treatment and look forward to working collaboratively with the Utah Division of Water Quality (DWQ) using best professional judgement to ensure that this vital natural resource is properly protected and managed.

RESPONSE SUMMARY

- State's vision for Utah Lake, Provo Bay?
 - o Provo Bay separated (higher level of attainment required?)
- Rush to listing
- Economic impacts
- Phosphorous loading
- Water Quality Council
- Unintended Consequences
- Tone of the report
- Concerns with the upcoming process as this is a first step sets the framework for future regulations

STATE'S VISION FOR UTAH LAKE, PROVO BAY?

In order for DWQ to assess the quality of a water body, it is first classified and designated for beneficial uses. Water quality standards are then developed by DWQ staff to determine if the water body is meeting these beneficial uses. If there are violations to the adopted standards, DWQ can move forward with assessment for impairment. These standards are not absolutes and can be assessed on a site specific basis.

Provo is in support of taking meaningful and scientifically proven, effective measures to address water quality in Utah Lake. Many of Provo's citizens, businesses and visitors use and rely on this natural resource. We want to care for it in a way that will keep it useful for generations to come.

Recognizing this, Utah Lake is not a pristine high mountain lake. It is located in a semi-arid region in the bottom of a basin. The lake is naturally shallow, turbid and eutrophic (biologically productive).

The shoreline of the lake has distinct wetland characteristics because of its gradual slopes and fluctuating water levels. In times of low water levels, water in Utah Lake can get quite warm in the summer. Due to the ongoing drought and high temperatures at the time of the algal bloom in July 2016, the lake temperature was 78 degrees. Also factoring into the bloom were calm conditions that lowered turbidity and low lake level backwater areas where retention time for the water is increased. All three of these are outside of the control of DWQ or the wastewater treatment plants. Does DWQ have scientific evidence proving that if phosphorous were limited from the wastewater treatment plants this event could have been prevented?

The Integrated Report designates Provo Bay as impaired for not supporting warm water aquatic life due to ammonia and high pH. However, Provo Bay, especially in dry years, acts more like a wetland area that supports birds and waterfowl. This use is necessary for the ecosystem and is not wholly compatible with being a warm water fishery when water levels are low. If the ammonia levels in Provo Bay are lowered, it could favor harmful algal blooms, which currently are not an issue in Provo Bay. The high pH also helps precipitate phosphorous. Changing these characteristics may cause undesirable consequences in Provo Bay.

In order to plan for the future, Provo needs a better understanding of DWQ's direction for management of the two water bodies:

- What is DWQ's vision for the uses of Utah Lake? Provo Bay?
- Is DWQ's intent to regulate Provo Bay to a higher standard than Utah Lake?
- What types of uses can be supported in consideration of the structure and characteristics?
- What level of water quality can be reasonably expected from Utah Lake? Provo Bay?
- What level of water quality is attainable in dry years such as 2016 or even more significant droughts?
- Can harmful algal blooms be controlled through reasonable means or is it something like a hurricane that is out of our control and needs to be managed to mitigate damage?

RUSH TO LISTING -

Provo respectfully requests that DWQ not list Utah Lake as EPA Category 5 impairment for secondary contact recreation due to Harmful Algal Blooms at this time based on the following:

- Only one IR cycle was used for the determination
- DWQ has not fully developed a monitoring and reporting program for harmful algal blooms
- Concerns that the Wastewater Treatment Plants are being targeted as the primary cause of the blooms
- The listing is premature and delisting is difficult

One IR Cycle – Chapter 5, Page 22 of the Integrated report states that DWQ's "... assessment methods for lakes and reservoirs previously required two IR cycles of equivalent support status to change the use support designation." The report goes on to explain that two cycles worked when the monitoring data was collected every other year for each lake, but now the sampling cycle is every six years, which is too long to wait to list. For Utah Lake, only one cycle was used based on this justification. However, 2014 was not a sampling year, but the data from the 2014 algal bloom is

used for the listing. Therefore, this rationale for rushing the listing in this IR cycle is not warranted. Provo recommends continued planning, testing and coordination to ensure the solutions will be effective.

Monitoring and Reporting – In the Integrated Report, DWQ says that it is, “...actively developing a monitoring and reporting program for harmful algal blooms. In the interim, DWQ will use the recommendations by the World Health Organization to guide this assessment” (Chapter 2 Page 59). The WHO standards focus on health impacts and not the causes of the blooms. Health advisories and listing are diverse issues that Provo requests be handled separately. While it is appropriate to utilize the WHO standards for the health advisories, this is a lower threshold necessitated by potential health risks due to exposure. Due to the characteristics of Utah Lake, it is not reasonable to hold to a standard that it is impaired if at any time the cyanobacteria cell count exceeds 100,000 mg/L especially when DWQ is using surface scum samples to obtain the high concentrations. According to the experts Provo has consulted, Utah Lake, in its best possible state, will continue to have algae blooms.

WHO monitoring guidelines state – “In designing and implementing monitoring programmes, all interested parties (legislators, nongovernmental organizations, local communities, laboratories, etc.) should be consulted. Every attempt should be made to address all relevant disciplines and involve relevant expertise.” Combining the expertise of all stakeholders in establishing the monitoring program will create a cohesive and validated program that will be most useful in making decisions.

Targeting Wastewater Treatment Plants – Provo is concerned that even though DWQ says in the report that they don’t know the cause of the harmful algae blooms, there is a rush to assume that reducing the nutrients from the wastewater treatment plants is “the solution” to water quality woes. DWQ’s answers to the frequently asked questions on their website confirm this.

Premature – For all of the above reasons, Provo feels that listing Utah Lake as an EPA Category 5 impairment for secondary contact recreation due to harmful algal blooms is premature. Provo has similar concerns about the listings for ammonia and pH in Provo Bay. The mechanisms for the listing seem to lack substantive proof that there is impairment. Delisting is a difficult process that requires justification. In order to best address water quality concerns in Utah Lake, ***Provo requests that DWQ designate Utah Lake and Provo Bay as EPA Category 3D – Further Investigation Required.*** This will enable Provo to move forward in collaboration with DWQ to assess issues and find appropriate solutions.

ECONOMIC IMPACTS-

In the frequently asked questions for the 2016 Utah Lake Algae bloom, DWQ published the following two questions and responses (emphasis added):

“IS THERE ANYTHING THAT CAN BE DONE UNDER CURRENT LAW TO FORCE ANYONE TO REDUCE THE AMOUNT OF NUTRIENTS GOING INTO THE LAKE? A: EPA has made nutrient reductions a national priority, as has DWQ. However, EPA has not established a numeric standard for nutrients, given the site-specificity of an

appropriate standard. DWQ has implemented a phased approach to nutrient reductions. One of the first phases of our approach is to require phosphorus limits for treated wastewater. These limits were established based on available treatment processes that were thought to best balance phosphorus reductions against treatment costs. On average, this modest step would cost taxpayers \$1.18/mo. To aggressively attack the problem the cost would be approximately \$15.50/month.”

“IF IT IS MOSTLY THE [WASTEWATER] PLANTS, HOW MUCH TIME DOES THE 2020 SOLUTION BUY US? A: The 2020 nutrient control plan is a *modest first step in controlling excessive nutrients*. It would establish a 1 mg/l phosphorus limit to discharges from the municipal wastewater treatment plants—with the exception of the Salem City lagoon which would receive a phosphorus cap. The present value cost estimate for this is \$114 million (2010 \$) statewide for the 34 mechanical treatment plants. That minimalistic step will not likely control future algal blooms, only help reduce them. *Controlling algal blooms would take a much more aggressive approach*—which would be to establish an effluent limit of 0.1 mg/l for phosphorus and 10 mg/l for nitrogen. The cost of that approach is estimated to have a present value cost of \$1,352 million (2010 \$), or on average \$15.50/month per household. The upgrades would include having wastewater facilities adopt biological nutrient removal technology, combined with filters.”

DWQ’s responses to these questions bring up several questions on how the integrated report will be implemented.

- Does DWQ have scientific evidence that the limitation of phosphorous to 0.1 mg/L will eventually be able to control or prevent algal blooms?
- Is there a documented nexus between reducing nutrient discharge from wastewater treatment plants and reducing harmful algal blooms?
- Considering the historic loadings in the lake and inputs from natural sources, when would these limits start to show an effect on the lake?
- Is any amount of nutrient removal from the treatment plants going to change the nature of the lake?
- What level of improvement can Utah’s citizens expect in Utah Lake and Provo Bay for the millions or billions of dollars that are expected to be spent to reach the potential nutrient limits?
- If treatment plant improvements do not make a difference, what is DWQ’s next step?

The \$1.18/month/household cost for removal of phosphorous to 1 mg/L provided by DWQ appears to assume a chemical process. Though the capital cost for such a process is substantially less expensive than biological, the operating costs are much higher. Chemical processes are not as environmentally responsible or sustainable because the phosphorous removed is not biologically available, which means must be disposed of in a landfill. Through our master planning process, Provo has determined that in order to renovate the wastewater treatment plan to enable a biological phosphorous removal process, the cost is over \$12/month/household. In order to get down to 0.1 mg/L , those costs will likely double.

Provo has a responsibility to its citizens to show that money spent to improve water quality will yield meaningful results. While the residents of Utah have expressed a willingness to financially support improvement to water quality, there is no reasonable expectation of a significant water quality improvement in Utah Lake with the anticipated nutrient regulations. Based on our discussions with experts, increased nutrient removal may not give us any bang for our buck. What is the benefit/cost ratio of the proposed regulations for Utah Lake specifically? **DWQ has provided no assurance that the benefit is much greater than zero and the costs are significant making the benefit/cost ratio infinitesimal.** Provo does not consider this a prudent or responsible financial investment.

The economic impact is not only limited to the money spent for upgrading and operating the plant, but what is the effect of designation on perception of the lake. Provo agrees that Utah Lake does experience algal blooms that are sometimes dominated by cyanobacteria, but these are not continuous events. In the most recent Utah Lake Commission meeting, staff brought up how the recent press coverage, which included interpretations by DWQ, of the algal bloom has damaged the public's perception of the lake and caused some to feel that it is perpetually unsafe. Provo recommends that DWQ continue working with the Health Department to limit risks to health and safety of recreational users by determining a methodology for identifying potential times of risk, establishing testing protocols, providing signage and education, and providing health advisories as appropriate. All of this can be done in a responsible manner that protects the public safety while limiting unwarranted health scares.

PHOSPHOROUS LOADING-

The IR states that, "The decision to list a water body as impaired is only the first step in a series of steps aimed at addressing the problem. Additional investigations are required before remediation plans can be proposed and implemented" (Chapter 5, Page 21). The IR assesses an impairment for harmful algal blooms on Utah Lake and establishes a high priority for the TMDL based on a narrative standard. Provo is concerned that the vagueness of this listing opens up the possibility for DWQ to implement a myriad of water quality standards.

Though the report says that there is uncertainty about the cause, one point that is repeated in the frequently asked questions on DWQ's website is that Phosphorous is one of the main culprits, and the wastewater treatment plants put 76.5% of the phosphorous into Utah Lake.

It is our understanding that Timpanogos and Orem are in compliance with the 1 mg/L. Provo's water discharged through the golf course is entering Provo Bay at a rate less than 1 mg/L. Were these rates factored into the percentages shown?

Golf course wetlands clean the water discharged by Provo's Water Reclamation Plant and provide higher water quality in Provo Bay and Utah Lake. Water quality sampling shows that the wetlands remove 30-40% of the Phosphorous before it is discharged to Provo Bay. Provo is not getting any credit for this on the discharge permit. In the future, we request that DWQ look at flexibility for multiple points of compliance to facilitate sustainable best management practices to enhance water quality.

With all of this, a significant question remains to be answered: If phosphorous is limited from the wastewater treatment plants, will it make a difference?

WATER QUALITY COUNCIL

Provo is actively involved in finding solutions for water quality concerns in Utah Lake. To this end, we have joined with the Utah Lake, Farmington Bay, Jordan River Water Quality Council. Through this council, we are getting experts involved and monitoring water quality in the lake to help assess the myriad of factors and seek out real solutions. Provo would like to continue to work with DWQ to determine an effective, sustainable approach that provides real results for the money spent.

UNINTENDED CONSEQUENCES

Without good evidence that there will be significant improvement to the water quality of Utah Lake, the potential exists for the consequences outweighing the benefits. One consequence is the increased carbon footprint of the process required to limit nutrients to the suggested levels. Good air quality is another desirable feature for Utah residents that should be considered in decisions made. Treating nutrients to this higher level costs more in energy, transportation of chemicals, and other high carbon footprint impacts. Additionally, treating water to the higher standards would make it more valuable for other uses rather than discharging it into the lake. How would removing effluent water affect Utah Lake over the long-term and especially in sustained droughts?

In the 2016 integrated report, Provo Bay is being separated as a water body and is being listed as impaired due to pH and ammonia for aquatic life. This listing could potentially put it at a higher level of regulation than Utah Lake, which could lead Provo and other POTWs to make the decision to bypass Provo Bay and put water directly into Utah Lake. How would Provo Bay be affected if it is bypassed by Provo and the other treatment plants? Could this negatively impact Provo Bay's support of aquatic life?

In the documentation from the experts, the assertion is made that limiting Nitrogen may lead to more toxic algal blooms. Cyanobacteria can fix Nitrogen (pull it from the atmosphere). When Nitrogen is limited, cyanobacteria have the competitive advantage over green algae. Provo Bay is an excellent example of the benefit of high available nitrogen in the form of ammonia. When Utah Lake was experiencing the harmful algal blooms in July 2016, Provo Bay did not have high cyanobacteria counts.

To address the water quality concerns in Utah Lake, Provo recommends working together and looking at the whole picture to make sure more problems are being solved than created.

TONE OF REPORT –

The tone of Chapter 5 of the Integrated Report is distressing. While it is good to educate the public on the potential dangers of exposure to toxins created by cyanobacteria, this report should not present a biased narrative. There are a number of areas where the language in the report moves from fact into speculation. Provo requests that the section on the dog deaths be stricken entirely. The explanation does not fully present the opposing evidence and is dismissive of the alternate

explanations. This discussion is only useful in evoking an emotional response and does not belong in this type of a report.

The monitoring information does not present a clear picture of what was being tested or how the testing is being performed. All the data is provided like it is performed the same. It is our understanding that the test with the largest concentration was a surface scum sample, and that the toxin result was questionable even to the person who did the test. In order to present this data in a scientifically helpful manner, standardized sampling and testing protocols need to be implemented and maintained. If different types of tests are performed, they should be presented in separate categories to enable meaningful conclusions to be made.

The news articles and frequently asked questions on the DWQ website relating to the July 2016 algal bloom continue this crisis narrative. They paint a doomsday scenario and then point to the treatment plants as the culprit saying that, "Yes, we can expect to see more of this in the future, especially if we do NOT start limiting the amount of nutrients that enter our waters." This leads us to be concerned that the conclusion has already been reached before the science is in. Provo hopes that as the site specific study for Utah Lake moves forward that experts are consulted, quality data is obtained and best professional judgement is used to the methodologies to address and solve problems that can be resolved. Provo requests active participation in this process as it moves forward.

UPCOMING PROCESS

As stated in the integrated report, designation is only the first step. The tone of the report and quotes in news articles and in the frequently asked questions raise concerns about the future regulations that will be based on this report and the site specific study for Utah Lake.

Provo requests working with DWQ in the spirit of collaboration as stakeholders seeking a sustainable approach. We support adaptive management and best professional judgement based on scientific reasoning and good quality data.

If you have any questions, please feel free to contact us.

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