

# **Bridging the Canyon**

## ***A report on Barton Springs and Barton Creek***

by Daryl Slusher

This is the second in a series of reports I am doing on the condition of Barton Springs and Barton Creek. This edition primarily concerns Barton Creek and the much-discussed hillside at an apartment complex just upstream from Barton Springs. Very high levels of PAHs have been found on the hillside.

These reports are part of the responsibility given me by the Council after articles in the *Austin American-Statesman* made assertions of potential health dangers at the pool, creek and hillside.

Those stories raised the specter of cancer, birth defects, memory loss and behavioral changes from swimming at the creek and springs or visiting the hillside. The articles said these dangers were likely more acute for children.

Professional health and environmental experts from four state and federal agencies investigating the situation have rejected these assertions of long-term health risks as well as any imminent health risks. So have representatives of M.D. Anderson Cancer Center who voluntarily stepped forward after reading the *Statesman* articles. The government officials and the representatives of M.D. Anderson say that the springs and creek are safe for swimming, backing the position of City staff.

Officials also say the hillside needs more assessment, but that it does not constitute an imminent health danger.

The investigating agencies are the Texas Department of Health (TDH); the Texas Commission on Environmental Quality (TCEQ); the Environmental Protection Agency (EPA); and the Agency for Toxic Substances and Disease Registry (ATSDR) – a division of the federal Centers for Disease Control. The federal U.S. Geological Survey (USGS), which has a long time relationship with the City on water quality monitoring, is also assisting in the process.

I will elaborate on the agency and M.D. Anderson findings in a moment, but first I want to make some remarks concerning the overall situation.

### **Barton Creek is safe for swimming, but faces many challenges to its future**

A fundamental point that needs to be made here is that both Barton Creek and Barton Springs are in trouble. Yes, experts say they are safe for swimming now, but City monitoring results over the last three decades show a clear pattern of deterioration in water quality.

This is the news that City staff has been delivering for a number of years. Now, the *Statesman* has interpreted those monitoring results, which few cities even bother to take, to claim serious health dangers that both public and private health officials say are not there. This has forced City, state and federal officials to spend hundreds of hours to investigate the allegations in the articles as well as reassure citizens that the springs and creek are safe for human contact.

It should not be lost in all this that both Barton Springs and Barton Creek face many challenges to remain safe and healthy bodies of water.

Also, care should be taken to avoid discouraging the *Statesman* from taking strong environmental stances. On the other hand we do not want to encourage them to scare readers into believing there are serious public health threats when both prominent public and private health authorities say those threats do not exist.

Now, let's return to the reports from scientific and medical authorities.

## **The Creek**

Representatives of the agencies investigating the health of Barton Springs and Barton Creek have not done as much study of the creek as of Barton Springs Pool. They offer assurances, however, that the creek too is safe for swimming.

At the February 5 Council work session Dr. Richard Beauchamp of the Texas Department of Health (TDH) said readings would have to be 100 to 1,000 times higher than in the springs to present a danger. The readings are not nearly that high. In fact they are in the same range as the pool.

Dr. John Villanacci of TDH added that the creek is also rocky, like the pool, and thus swimmers are unlikely to come into prolonged contact with sediment. Villanacci and others at the work session explained that PAHs bond to soil and sediment, not to water. He also explained that the key to risk is exposure combined with the level of the dose. With the above stated conditions prolonged exposure is highly unlikely. In summary, any potential health risk from PAHs would arise only from prolonged contact with sediment, which is unlikely to occur in rocky Barton Creek or Barton Springs Pool.

The main chemicals invoked by the *Statesman* were PAHs and arsenic. PAHs are polycyclic aromatic hydrocarbons, a family of chemicals produced by the combustion of organic material and commonly found in urban environments. Discussions by both the *Statesman* and the government agencies have focused on Benzo(a)pyrene, (BaP), the PAH of greatest concern. That is because, more than any other PAH, BaP is found in City sediment sampling at levels above which TCEQ would recommend further sampling and evaluation. Also, because quantitative toxicological testing on laboratory mammals has been performed more on BaP than other PAHs, cancer risk from PAH mixtures is commonly expressed as BaP toxic equivalents.

Both the *Statesman* and the City have theorized that the PAHs originate from coal-tar waste. They disagree over the source, with the *Statesman* saying buried waste from a century or more ago while the City believes the source is a coal-tar based seal coat used on the apartment complex parking lot.

The *Statesman* also reported "extraordinarily high levels" of "neurotoxins such as mercury and the pesticide heptachlor," and said experts interviewed by the paper saw those high levels as an indication that "there may be previously unknown hazardous waste sites nearby."

In a later article the *Statesman* also reported that lead had exceeded the federal drinking water limit in the creek and springs. This is true. Barton Springs Pool water has been tested for lead 184 times since 1978. Four readings were above the drinking water standard.

Barton Creek water downstream of the pool has been tested for lead 35 times since 1975 with five detections above the drinking water standard. Upstream from the pool there have been 50 tests since 1997 with four above the drinking water limit.

Both state and federal officials, however, expressed caution and concern about drinking water standards for lead being applied to recreational water standards. Villanacci explained that it is important to remember that this is not drinking water, it is recreational water and thus the exposure assumptions are quite different. Lead was not discussed very much at the forum and work session, but agency representatives did have lead monitoring results when they said the pool is safe for swimming. I will give more details on lead after the final report from the agencies which will cover a wide array of chemicals.

So let's go through these chemicals one by one.

### **PAHs/Benzo(a)Pyrene**

Like the water in Barton Springs Pool, the water in Barton Creek has never been found to contain PAHs, in particular BaP. (Two PAHs, fluoranthene and naphthalene, were detected once in the water at Eliza Springs. However, according to City staff, neither is typically considered carcinogenic and both were well below applicable human health standards.)

BaP, however, has been found in the sediment in Barton Creek at levels exceeding state screening levels or Protective Concentration Levels -- both above and below the pool. PCLs are risk standards used as cleanup goals if it has been determined that there is a human health risk associated with sediment or soil contamination. As detailed in Part 1, experts pointed out repeatedly that PCLs are not automatic triggers indicating imminent health dangers.

Previous City readings showed BaP to be more consistently elevated in the creek sediment above the pool than in the pool sediment, although it never reached the highest level found in pool sediment. Since 1991, out of 167 sediment samples at 72 sites in Barton Creek, BaP was detected 79 times, 35 times above the sediment PCL. It is important to point out that these statistics are in part a result of samples which were deliberately taken in the same areas where high readings were previously found.

City staff efforts to identify sources of the contamination ultimately led them to the hillside near the apartment complex (more on the hillside below).

### **Arsenic**

The other chemical most frequently invoked in the *Statesman* articles is arsenic. The City and USGS have taken 185 measurements for arsenic in Barton Creek surface water since 1975. In those measurements arsenic has been found only once at a level above the current EPA drinking water standard. That was during an October 1984 storm. The reading was taken at the USGS station near Camp Craft Road.

Ground water in the Barton Creek watershed has also been tested extensively. Since 1978 the City and the USGS have measured for total and dissolved arsenic in 47 different springs and wells throughout the Barton Creek watershed, including Barton Springs. That constituted 417 measurements since 1978.

Only one was above the current EPA drinking water standard (at the time the reading was below the EPA drinking water standard, but that standard has since been

strengthened). That was the sample collected in 1995 during the sediment plume event within Barton Springs Pool described previously in my first report on this issue.

It should be noted here that the plume sampling came from the pool, which means it may not have originated from Barton Creek, but could have come from one of the other five creeks that contribute to Barton Springs through recharge.

As to arsenic in Barton Creek sediment, the highest detected measurement according to City officials was less than a fifth of state PCL levels. Note that the EPA drinking water standard is used for water samples while PCLs are used in relation to sediment and soil.

Also, it's worth pointing out that the detection of arsenic in and of itself does not mean there is a health hazard. Arsenic is a naturally occurring metal commonly found in Texas soil. Save for the instances mentioned above, arsenic detections in Barton Springs and Barton Creek are at or below the background levels typically found in rural and agricultural soil.

### **Heptachlor and Mercury**

The *Statesman* also reported “extraordinarily high levels” of “neurotoxins such as mercury and the pesticide heptachlor,” and said experts interviewed by the paper saw those high levels as an indication that “there may be previously unknown hazardous waste sites nearby.”

Unlike arsenic, heptachlor is a pesticide that does not occur naturally. Its presence is a clear sign of the effects of urbanization. But, were “extraordinarily high levels found upstream in Barton Creek and on the hillside” as the *Statesman* reported? City staff says no.

City staff report that heptachlor has never been detected in Barton Creek water. There have been 65 measurements for heptachlor in Barton Creek surface water since 1975. All were below detection limits. Groundwater in Barton Creek (including Barton Springs) has been measured for heptachlor 35 times at 10 locations since 1978, with no detections reported.

Barton Creek sediment has been measured for heptachlor 116 times since 1991 with 8 detections. None were above TCEQ concern levels for sediment. (A detection means the chemical was present, but not necessarily at an unsafe level. In fact a detection that rises above the PCL level does not necessarily mean a human health risk exists, but it does mean more attention is warranted.)

Although not as pervasive as arsenic, mercury is a naturally occurring metal that can be elevated by contamination from man-made sources. Overall, mercury has been detected in Barton Creek surface or ground water, 18 times out of 307 measurements. Only one of the detections exceeded the EPA drinking water standard. That was during a 1985 storm. The most recent detection was in 1993.

City officials say monitoring data shows that mercury has never been detected in Barton Creek sediment above state PCL levels for sediment.

For the record, City staff point out that neither water nor sediment from this section of the creek typically makes it to the pool – except in a flood when the pool is closed. That is due to the bypass for Barton Creek water and because no recharge features have been found downstream of the hillside.

## **The Hillside**

The agencies all concur that the hillside by the apartments merits further assessment due to the high levels of PAHs found there. Agencies are in the process of determining the severity of the problem and what action, if any, will be required.

They also all reported that the hillside is not an imminent health risk. “If it was we would have already been moving people out, said TCEQ Deputy Director Mark Vickery. (In the early ‘90s TCEQ moved residents out of the Waters Mark Apartments in East Austin when methane gas was discovered beneath the complex.)

As reported by the *Statesman*, BaP has been found on the hillside at very high levels. In 48 tests for BaP at 31 sites on the hillside since 1998, BaP was detected 39 times, with 30 above the soil PCLs. No arsenic measurements on the hillside, however, were above the TCEQ residential soil PCL.

Mercury and heptachlor were reported by the *Statesman* to have been found at “extraordinarily high levels” on the hillside. In fact both mercury and heptachlor have been detected in soil there, but they have never been found at levels higher than state soil PCLs.

Health experts pointed out again that the risk is proportional to the amount of exposure. Villanacci said that this is “not a back yard situation” where a child would play frequently. Beauchamp similarly said that it is a small area with broken glass and tumbled rocks, not one where children were likely to play often.

Nevertheless Beauchamp offered a risk scenario of a child playing there twice per week from age six to sixteen, weighing about 65 pounds, playing in dirt, throwing rocks, getting sediment on his or her hands for two hours every weekend, for half the year, for 10 years.

This scenario, said Beauchamp, yielded “a fairly low risk level,” a risk that was “certainly not in the category of an imminent health threat.”

To summarize, BaP has never been found in Barton Creek water, but has been found at high levels in Barton Creek sediment and on the hillside.

Arsenic has been found once in Barton Creek at levels exceeding federal drinking water standards, in 1984, and once in ground water, 1995. Arsenic has never been found in Barton Creek sediment or on the hillside at levels exceeding the state PCL screening levels.

Mercury was found once in Barton Creek water at levels above drinking water standards, in 1985. Mercury has never been detected above state PCLs in Barton Creek sediment or hillside soil.

Heptachlor has never been detected in Barton Creek water. Heptachlor has never been found at levels that exceed State PCL’s in Barton Creek sediments or on the hillside.

These results call into question what data was used for the *Statesman* experts to say that there are the “extraordinarily high levels” or mercury and heptachlor in the creek and on the hillside. Also, arsenic was overplayed.

## **Officials find no evidence for coal gasification theory**

Officials with the agencies also reported that preliminary results, based on borings done on the hillside and under the apartment complex parking lot do not support the

theory of buried waste. Results instead point toward the City theory that the PAHs are coming from the sealant on the parking lot.

Peter Van Metre of the U.S. Geological Survey said there is “no clear evidence of any kind of waste disposal there.”

Villanacci added, “There are no indications that I have seen that there is something seeping out from that hillside...which is generally supported by the boring samples.” He said indications are that the pollution is coming from something at the surface level. He pointed out that one can observe with the naked eye that the parking lot is wearing off. He traced at least some high readings to an area “blackened” with runoff from the apartment complex parking lot.

These points were also emphasized at the public forum on March 27. For example, Don Williams, a high level EPA official based in Dallas said, “Data from boring under the apartment complex parking lot did not show evidence of buried waste.”

Also at the forum Michael Honeycutt of TCEQ reported: “We are almost there that the source of the PAHs is the parking lot sealant.”

These findings are also supported by samples the City took at other parking lots around town, including the *American-Statesman* parking lot on the shores of Town Lake. The City found that runoff from parking lots with coal tar based sealants had high PAH readings while straight asphalt parking lots did not.

For example, according to City staff, the level of BaP detected in the *American-Statesman* parking lot was considerably above state PCLs, in the same general range as the City’s BaP samples from the hillside. Some of the hillside readings are higher than the *Statesman* parking lot, but almost 90% of the hillside BaP readings are less than the maximum reading in the *Statesman* parking lot.

The BaP level found at the *Statesman* was:

- 391 times greater than the TCEQ residential soil PCL value; and
- 33 times greater than the maximum detection of BaP in Barton Springs Pool.

If the PAHs are coming from coal-tar based parking lot sealants then the next step will be to see if that presents a health risk. If that were the case, then a logical next step after that would be to consider banning such sealants. City attorneys have studied whether Texas law allows municipalities to ban such products. They have concluded that such a product could be banned if there were a reasonable basis for doing so.

A caution is in order here. Citizens should not assume that wherever there is a seal coated parking lot there is a health danger. As health experts have said, prolonged exposure is the key. Questions still remain about how easily these substances would absorb onto and enter tissue. Furthermore not all pavement sealants contain coal-tar.

Even if they were banned in Austin that would leave the sealants still on sale in the rest of nation, including immediately outside City of Austin jurisdiction in this region. Federal and state authorities are looking at the situation, but no specific course of action has been decided – in fact the sealants have not yet been officially termed as the primary source of the PAH pollution.

The *Statesman* articles might have helped surface a story of potentially national dimensions, but ironically their stories had a different theory about the source of the pollution. Not only that, but the *Statesman* editor ridiculed the City for spending time on the parking lot theory, in his January 19 column (the same day the first story was published).

The *Statesman* renewed that theme in editorials and articles in late March. The editorial board went so far as to charge: “It appears that state and city officials are most concerned with proving their own hypothesis – that the pool is safe despite the chemicals found in the sediment or water, and that the chemicals come from parking lot runoff, not an old waste site or other source.”

One point to note here is that the state did not come up with the hypothesis that the pollution is coming from parking lot sealants. That was the City. As Honeycutt of TCEQ said at the forum March 27, the state had no idea as to the source of the pollution when it took up its investigation. Now, after studying City data and doing its own testing, said Honeycutt, TCEQ is almost to the point of concluding that the source of the elevated PAHs on the hillside is the parking lot sealant.

Another point to note here is that City officials have consistently pointed out that the hillside is not the only source of PAHs in the Barton Springs Zone. So determining the source of the hillside pollution will not solve all problems with PAHs.

The final report from state and federal officials will look at a much wider range of chemicals and potential pollutants than discussed in the *Statesman* articles.

### **Superfund Site on Barton Creek?**

The *Statesman* has also repeatedly compared readings on the hillside to a Superfund site. Officials with the EPA and TCEQ both said the hillside does not appear to meet the requirements for a Superfund site. Williams, who works with the EPA superfund program said it is “clear that more assessment is necessary,” but “based on the data that we’ve seen from the borings this does not fit the profile of a Superfund site.”

Williams explained that superfund sites are generally at locations of past disposal or commercial processes and contain waste generated from those activities. That does not appear to be the case here he said.

Williams also discussed screening levels in relation to Superfund sites. He said screening levels provide “an indication that further assessment may be warranted.”

“They are not used as a trigger to say that a site should become a Superfund site,” he continued. “They are also not used to say that we need to take an action.”

In fact the first page of EPA literature about screening levels warns: “**SSLs are not national cleanup standards** (EPA’s emphasis). SSLs alone do not trigger the need for response actions or define ‘acceptable’ levels of contaminants in soil.”

Federal and state officials are studying whether further action is needed on the hillside including whether to require a cleanup. As previously noted, officials with several agencies said they do not believe the hillside constitutes an imminent threat to public health.

### **Barton Creek safe now, but what about the future?**

In a separate matter, the creek currently has a large algae bloom beginning slightly upstream from the hillside. City staff has not been able to determine the cause of the bloom. They say it could be natural, but no one knows for sure. Some algae blooms in the past have been caused by leaking treated sewage entering the creek from irrigation on golf courses and leaking sewage pipes. Thus far however, the City has not been able to find any leaking pipes in this area. The City is in the middle of a massive program to repair leaks in sewage pipes throughout the entire city system.

This bloom is considerably downstream from any golf courses so investigation continues. City officials say the bloom should dissipate naturally during the summer months. We will keep watch on that.

In conclusion, as with the springs, the agency representatives say Barton Creek is safe for swimming. Also like the springs, and as the algae bloom problem illustrates, Barton Creek faces many challenges if it is to remain safe for swimming.

Many of those challenges lie beyond Austin’s borders and jurisdiction. More than 70% of the Barton Springs Zone, the six watersheds that contribute water to Barton Springs, is outside the City of Austin’s jurisdiction. With the exception of Buda those regulations are much weaker than Austin regulations and in many cases virtually non-existent. This problem is more acute now than ever because of growth pressures in Hays County and previously rural parts of Travis County.

Among other things, this shows the need for a regional plan to protect the area. Intensive efforts are underway on that front and I will update folks on them in a separate document soon. I will also be elaborating soon on the other major threats to water quality in the Barton Springs Zone.

I am hopeful that a good thing that can come out of the *Statesman* articles is increased attention to water quality and the pollution of Barton Springs and all our waterways.

In closing, a way every citizen can help immediately, especially those who live over the Barton Springs Zone, is to avoid using chemicals on your lawns. The same is true for businesses that are located within the zone. This is a way not only to prevent future pollution, but also to reverse existing pollution.

Additionally, recent studies done in a City partnership with Texas A&M have shown that organic fertilizers are more effective than synthetic fertilizers and chemicals,

and that lawns need far less fertilizer (as much as 75% less) than has been recommended for decades..

Just two Saturdays ago Barton Hills Elementary planted a native plants garden with some 100 parents participating along with students.

Also, the Barton Hills Neighborhood Association is currently initiating cooperative efforts with the City to widen participation in the City's Grow Green Program.

For more information go to <http://www.ci.austin.tx.us/growgreen/> or just don't use chemicals on your lawn.

Thank you for your attention to this matter.  
Daryl Slusher

Austin City Council