Too Much or Too Little Water Can Lead to Litigation

By Jeffrey A. Bolin, Vice President of Technical Operations, The Dragun Corporation

Be it floods, rising and falling of lake levels, states fighting over jurisdiction of water in rivers used for drinking water supplies, or counties and states rationing water, to name a few, we have all seen news stories on the "grand scale" of too much or too little water. "Water wars" have been going on for many decades, if not centuries, but seem to be more prevalent in the news recently. While these grand scale news stories get national attention, similar scenarios are occurring on a much more local scale resulting in litigation.

I have been in the environmental business for over 40 years. Many of the regulations to protect water were just coming into play in their relative current form back then. Those regulations, for the most part, focused on protecting water from contamination. Much of my career has focused on the investigation of releases of chemicals into the environment and the resultant impact to groundwater and surface water quality.

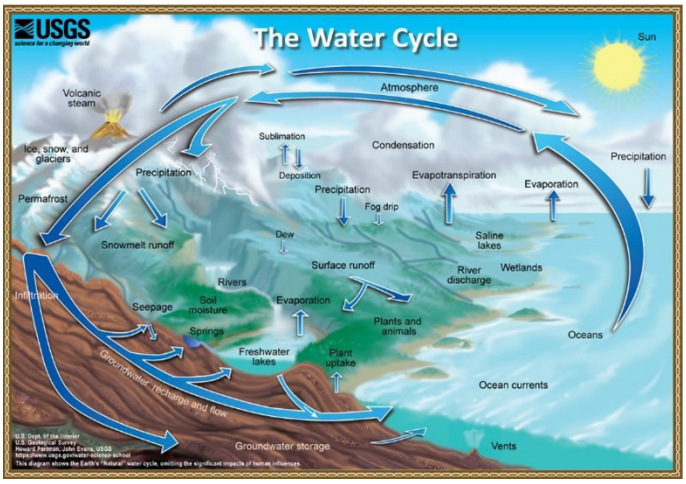

Figure 1 - Courtesy of H. Perlman, J Evans, USGS

Natural and Anthropogenic Factors

More recently, a fair bit of our work has revolved around the quantity of water and not the quality of water. Putting aside the political causation arguments of global cooling, global warming, climate change, or climate disruption – too much water or not enough water has consequences and can and does lead to litigation.

Whether too much water (e.g. flooding) or too little water (e.g. drying streams, decreased or no well yield), understanding the dynamics of the natural hydrologic cycle can be complex (refer to Figure 1). If these natural complexities are not enough, add in man-made influences such as infrastructure (e.g., roads, dams, levees, storm water controls, etc.), and property development that change the natural geography and permeable surfaces to name a few. The "obvious cause" is not always the actual cause (or the only cause). The interaction of precipitation, surface water, and groundwater needs to be understood on both the "local" and regional scale.

Conventional Wisdom and Scientific Investigations

For example, before the mid-1970s, the general thought was flooding was all related to precipitation runoff. Specialized scientific investigations using isotopes have since shown that groundwater discharge during storm and snowmelt events is a significant contributor to flooding. On a regional scale, increasing sea level, increased storm intensity,

and land subsidence contribute to floods in coastal areas. For smaller catchments, understanding the role of groundwater discharge during storms and the relationship between precipitation trends and groundwater levels are critical in understanding flooding issues and true causation.

Groundwater and streams are symbiotic. Too much groundwater withdrawal can lead to streams drying up. On the other hand, a rising water table can result in an overabundance of groundwater discharge to streams, causing soggy areas and flooding around streams that 'typically" had minimal flow or were previously dry.

Case Study: Litigating Water

The following case highlights the complexities of understanding, in this case, the contributing factors of excess water and "shedding light" on what might appear to be the "obvious" causation. The case (Case No. 2018CV00580) was in northeast Ohio, south of Cleveland.

Our client (defendant) expanded their plant and asphalt parking/driveway area. As part of the expansion, they installed a storm sewer system, including a detention pond, on the west portion of their property. The discharge flow from the detention pond crosses the adjacent road through a culvert to the south and through a swale across a farm property owned by the plaintiff. The culvert and the swale existed prior to the plant expansion and served as the drainage path for much of the area in question. The swale discharged to an established creek.

The plaintiff claimed that the added water from the defendant's expansion made his property unusable as a farm due to flooding of the swale and he sued for $1.3MM in damages.

Obvious Answer v Scientific Investigation

At first glance, one would think that the expansion of the building and parking area and the resultant additional volume of storm water added to the "flow system" is the "obvious" cause of the flooding in the swale. We did not dispute that more area drains to the south after the plant expansion. However, it is more complex than how it appears "on the surface." Let's look at the factors that were considered in understanding and ultimately defending this case.

First, we looked at topography to understand how storm water previously flowed from the defendant's property as well as how the expansion and storm water detention pond influenced storm water flow. Pre-development there was a topographic divide that caused some surface water to flow away from the plaintiff's property. The developed grade of the defendant's property was designed to direct all storm water to a detention pond. As previously stated, we did not dispute that more area drains to the south after the plant expansion.

Second, we looked at the design of the storm water collection system and detention pond. The system, which was approved by local officials, was designed to capture the storm water flow and limit the discharge to the pre-construction flow rate. The discharge may flow for a longer period of time but the rate was controlled.

So, what could be causing the wetter conditions on the plaintiff's farm?

Summary of Litigation Support

Stream Data. In humid climates, groundwater progressively adds to stream flow and between storms, groundwater supplies "base flow" to the stream. The United States Geological Survey (USGS) monitors flow in the established creek that receives the swale discharge. The hydrograph (basically graphs showing stream flow characteristics) of these data show peaks (i.e., rain events) and valleys (i.e., base flow), and overall flow trends of the stream.

Based on the hydrograph, the plaintiff purchased his property (2011) when it was relatively dry (low base flow). The hydrograph showed an upward trend in base flow from 2016–2019. The defendant's expansion occurred in 2016. What looked like more flow due to the expansion and storm water pond was likely naturally occurring greater base flow from greater groundwater discharge to the swale.

Groundwater Data. The USGS also monitors groundwater throughout the United States. Monitoring data from a nearby water well showed seasonal variation including an increasing trend in groundwater levels since about 2013. These higher groundwater levels are consistent with an increased discharge to the stream (and the swale) and an increased base flow.

Precipitation Data. Annual rainfall data from 1990 to 2018 was obtained and analyzed from a nearby airport. These data showed the average annual rainfall over the period from 1990-2010 to be approximately 40 inches per year, and from 2011-2018 to be approximately 43 inches per year.

These data are consistent with higher groundwater levels, as well as increased base flow in the swale.

Regional Information. One more piece of evidence that the increased flow has natural causes included looking at the Great Lakes water levels. Lake Erie (approximately 60 miles from the site) showed water levels about 3 feet higher than they were in 2014. This information is consistent with the previous data.

Plaintiff Activity. Likely due to the wetter weather and higher groundwater levels, the plaintiff made improvements to the drainage on his property to keep the farm land dry. He channelized the swale and added drainage tiles to drain the field. These changes likely added water to the swale

Our Opinion. Defendant acted appropriately and reasonably in constructing the storm water control system. Natural conditions can explain the increased water in the swale described by plaintiff. Plaintiff likely exacerbated the issue by adding draining on his own property

Outcome of Trial. The jury deliberated for less than 2 hours and found that defendant was not responsible for water level increases on the plaintiff's property. No damages were awarded.

Litigating the amount of water, whether too much or not enough, requires a multi-disciplined technical approach and evaluation of many factors. The "obvious" is not necessarily the answer to the causation.

Author

Jeff Bolin is the Vice President of Technical Operations at The Dragun Corporation. Jeff has over 30 years of experience in environmental project management; consulting and litigation support with attorneys; financial institutions; and industrial, municipal, and commercial clients. He holds a Bachelor of Science degree in Environmental Science and a Master of Science degree in hazardous waste management.