

**Tracing in the Balcones Canyonlands Bull Creek Preserve: Lanier and Hog Wallow
Springs**

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Lanier and Hog Wallow Springs provide a significant volume of water to Bull Creek and tributary 7 respectively and are sites of the rare Jollyville Plateau Salamander. Both springs discharge from alluvial deposits adjacent to the creek channels and there are no bedrock exposures in the immediate vicinity of the springs. To examine water sources for the springs, environmentally safe organic dyes were poured into the flowing water upstream of each spring and all surface flow ended upstream of each spring (Figure 1). Monitoring concluded October 16th.

Hog Wallow Spring Trace

On July 22nd, 0.25 (1/4) pounds of fluorescein dye was poured into tributary 7 about 760 feet upstream of the spring (Photos 1 and 2). Surface flow ended approximately 300 feet downstream of the injection area. Dye was poured in 1/3 doses about 5 hours apart, beginning at 0940 and ending at 1855.

Preliminary results indicate that the tracer first reached the spring by 1330 or within 4 hours of injection. The tracer continued to be detectable until drought caused the spring to dry up in August. Heavy rain in September recharged the groundwater system and dye was again detectable until the end of sampling in October. Dye was detected at all the sites downstream of Hog Wallow, including in Pit Springs, which does not have any surface flow connection to tributary 7. This suggests that a part of the source area for Pit Springs includes tributary 7 downstream of the injection area. Since there are no bedrock exposures in the tributary 7 channel downstream of the injection area or Hog Wallow, the water (and dye) may be recharging the bedrock aquifer through the alluvium below tributary 7 and discharge from the channel outlets of Pit Spring. Dye was also detected in the main stem of Bull Creek downstream of the Pit Spring adjacent to the confluence with tributary 7 at a similar concentration as from the channel outlets upstream. This suggests that tributary 7 is also recharging the alluvial system that feeds the creek from the west side of the channel.

Lanier Spring Trace

On August 6th, 0.375 (3/8) pounds of eosine dye was poured into the main stem of Bull Creek about 980 feet upstream of Lanier Spring (Photos 3 and 4). Surface flow ended approximately 300 feet downstream of the injection area. Dye was poured in 1/3 doses about 5 hours apart, beginning at 0925 and ending at 2000.

Preliminary results indicate that the tracer first reached the spring by 2015 or within 11 hours of injection. The tracer continued to be detectable until the end of monitoring in

October. The spring did not dry up during the monitoring period although the adjacent creek contained only pools in August until the heavy rain in mid-September. The dye was detectable at the channel sites downstream of Lanier Spring. The dye in this trace was not detectable in the bank outlets of Pit Spring until after the mid-September rains. Previous tracing (Johns, 2014) has demonstrated the connection from the channel upstream of Pit Spring to bank outlets for the spring.

A Watershed short report on this study will be completed in early 2015.

References

Johns, D.A., 2014, in review, *Results of Tracing for Pit Springs and Four Points in and Near the Balcones Canyonlands Sam Hamilton and Bull Creek Preserves*. City of Austin Watershed Protection Department Short Report SR-14-04, 27p.

Lanier and Hog Wallow Traces 2013-14

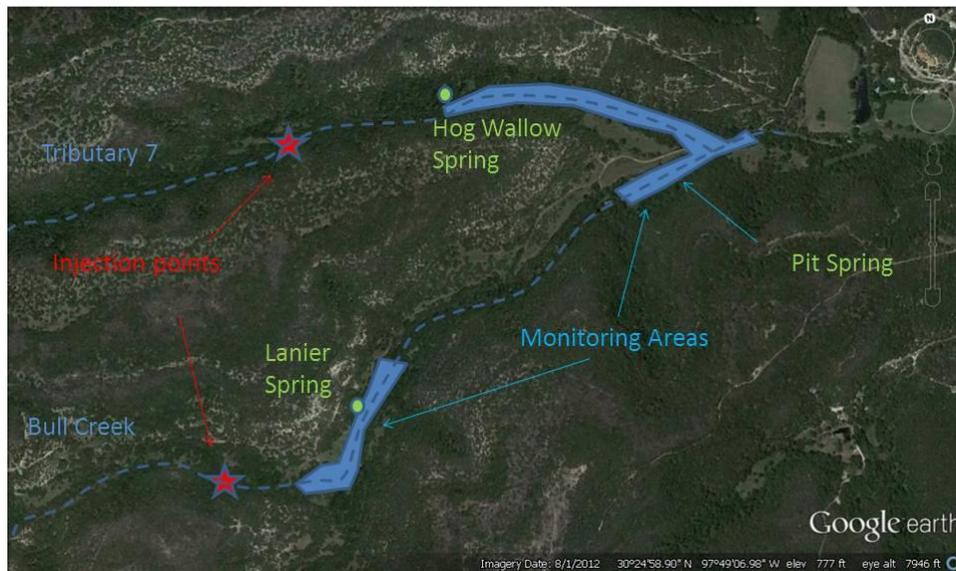


Figure 1. General dye injection and monitoring areas in the Balcones Canyonlands Preserve for the Lanier and Hog Wallow traces.



Photo 1. Injection of fluorescein dye into flowing water in tributary 7 upstream of Hog Wallow Spring on July 22nd. Surface flow ended approximately 300 ft downstream.



Photo 2. Watershed employee Rosemary Hatch collecting a water sample from tributary 7 following injection of dye upstream. All surface flow ended within 30 ft downstream of this location.



Photo 3. Watershed staff pouring eosine dye into the main channel of Bull Creek upstream of Lanier Spring. All surface flow ended approximately 300 feet downstream.



Photo 4. Eosine dye in Bull Creek about 300 feet downstream of the injection point near where all surface flow ended.