By: Robert J. Reese, PLS

Black Hill Reset 2006

The morning broke calm and overcast, the weather not so much threatening rain as trying to decide what to do. There was a slight drizzle in San Luis Obispo, but I decided to go to Morro Bay to see if anybody else shows up for our planned event. The announcement for the effort to reset a monument at the top of Black Hill in Morro Bay did say weather permitting, so it would be chance to find out if the weather really would issue us a permit.

The ride to Morro Bay got really rainy at one point, but upon arrival at the parking lot below the hill it was apparent that there had been little or no precipitation in the area, and it looked like the ground wouldn t be very muddy, so I parked a while, just before 8 a.m., in the parking lot at the trail head up to the top. I reviewed the research materials I had acquired on the NGS monument BLACK HILL RESET (PID FV1654) with all the various descriptions and recovery notes, starting from 1881, when the station was established, up until 2002, when it was reported as possibly missing.

First, a little background. The original mark was established by United States Coast and Geodetic Survey (USC&GS) in 1881, as part of the control network for the coast survey work. The mark is located at the summit of Black Hill in Morro Bay, San Luis Obispo County, and commands a wide (and spectacular) view of the coast and much of Los Osos Valley extending to the east. It is a good vantage point from which to turn angles for the triangulation control work that the USC&GS performed.

Over the years, the BLACK HILL evolved from a stub (stake), to a bronze monument in concrete set over a glass bottle in concrete, to BLACK HILL RESET, a California State Lands Commission (CSLC) brass cap set in concrete over a bottle without concrete. The reference marks multiplied over the years, from four leads and copper tacks first described in 1883 to two standard USC&GS bronze disks in 1919, to an additional disk recovered in 1978. The notes from the data sheets posted by the National Geodetic Survey (NGS) only pick up from the 1950 s, so fortunately I was able to locate some of the paper recovery notes by USC&GS that compiled the preceeding 75 years of recovery work.

Throughout the various intervening years, some of the reference marks were described as missing, only to mysteriously reappear in later recovery notes. Looks like the diligent search has been implemented with varying levels of energy for quite some time.

In January of this year, a client asked to have some points, shown as ordinary high water (OHW) line on a CSLC map located on the ground. The CSLC map was dated 1957, and was based on NAD27. It listed many points and their NAD27 state plane coordinates, but set no physical marks on the points along the line, so the only way to recover those points was by locating their coordinate positions. Additionally, the map showed several local control points with NAD27 SPC values, and so provided enough data for a good control scheme and layout. Time to break out the GPS and stakeout, with RTK, some of the points to see how well I could verify the control system and then to see where the OHW points fell. Three or four centimeters was good enough for the client, and the NAD27 coordinates were given to the nearest foot, anyway.

So, after finding an appropriate local base monument (WHITE RESET, PID FV0403), and armed with the coordinates for several other control points, I set off in search of check points. The first, about half a kilometer away, was indicated on a very brushy hillside in shoulder-high sage and poison oak. Clearly, that check point was Plan C, or even D. The next point lay atop Black Hill, a moderately steep 10-minute hike up a well-worn path. But the recovery notes from 2002 weren t promising, as the description said DID NOT FIND THE STATION MARK BUT IT MAY BE COVERED WITH DIRT. DID NOT SEARCH FOR RM3 . Now, I m all for submitting recovery notes, but if I have to break out a shovel, hey, that s going a bit far, don t you think? Besides, it s much easier to submit recovery notes that tell the world I didn t really look for the monuments, anyway.

After some field preparation, off I go to the top of Black Hill, with shovel (I know, above and beyond the call) and detector, looking for a dirt covered mass of concrete with a brass cap and several reference marks.

After a short search atop a bouldered summit at the stake out position, I dug a shallow pit in a soft earth. No concrete, no brass cap. However, about 10 inches down, I heard a tink and was rewarded with a glass bottle! The bottle neck, I was told, was typical of 19th century glassware, and the bottle body was firmly planted in the earth, upright and surprisingly empty, as there was no cover or stopper in the bottle. Verification of its position with my RTK rover showed it was within 1 cm of the published NAD

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27 coordinates. One of the 1919 reference marks was measured and the inverse from it to the bottle was also within 1 cm. Not trusting results this good, another couple of marks shown on the CSLC were recovered and verified, also within 1-2 cm. I felt reasonably sure that the control system and positions on the CSLC map were good to go, and so continued on with the project at hand. But that s another story.

A recounting of the experience at a dinner meeting of the Central Coast Chapter of CLSA lead to interest by some of the members, for doing a remonumentation project. Although BLACK HILL wasn t really worth preserving as a present day geodetic position, it did have some historical value with its ties to other surveys on older, superseded datums. So, with more than a few hands raised in support of the effort, the chapter decided to reset something to preserve the mark. This time we would set a monument that would offer more resistance against visitors looking for memorabilia.

Back to Saturday morning. Around 8 a.m., first one truck, then another, then another appear at the remote parking lot, bearing survey company logos. Skip Touchon showed up, ready, willing and able, followed shortly by Michael Stanton and son Conner. Leonard Lenger, who contributed greatly in preparing a check list of stuff for the project and in designing the monument, arrived with concrete and other materials. I had a couple of buckets filled with tools, compasses, steel tapes and other stuff, as well as notebook and camera to memorialize the effort. With everybody shouldering some of the burden, off we go. The morning, still overcast, only drizzled on us briefly, but looked like it was going to issue our permit after all.

Everybody arrived at the summit breathing hard after the climb, with the concrete and tools and water necessary. We hoped to make it in one trip, and almost did. We set about uncovering the bottle (which I covered back up after my departure in January), and found it as I had left it, along with some additional spikes and flagging set as guides to its location.

The top of the bottle neck, which was broken away from the body of the bottle during my prior search, slid right into place and was epoxied onto the body. A rubber stopper and brass tack was centered in the neck and we set some spikes as temporary offsets from which we would reset a bronze cap on the top of the monument. We had decided to build a monument that would leave the bottle intact, but still provide a durable mark directly above the center. The plan was to set a PVC sleeve over the bottle (but not attached to it), cap the sleeve and then set a form around the sleeve into which we would pour concrete and set the bronze cap. The concrete would be anchored to the rock below by form stakes

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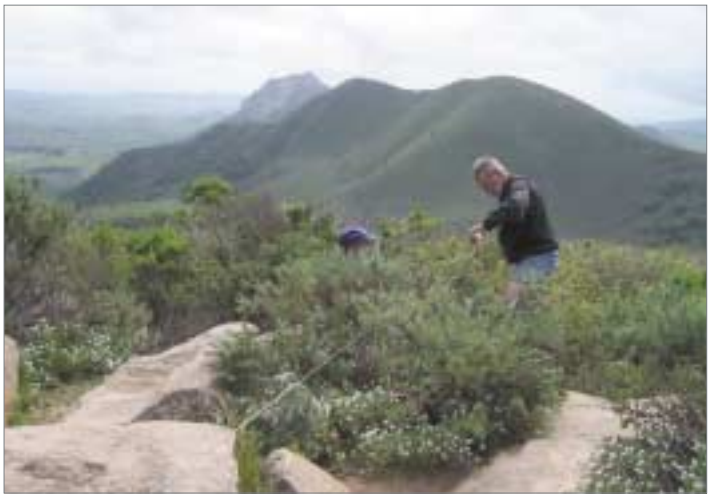
driven into the rock, with some reinforcement in it, and provide enough resistance to discourage any would-be souvenir hunters from taking this one home.

All went well, with only a couple of trips back down to the trucks for more concrete and for a plumb bob to use for distance ties to the found reference marks. The bronze cap, donated by the County of San Luis Obispo Surveyor s Office, was set. It had been pre-stamped with COUNTY OF SAN LUIS OBISPO SURVEY MONUMENT, BLACK HILL RESET 2006 CLSA . All the reference marks, starting back in 1883, were recovered and all that was left was to measure with a steel tape the distances to those marks. We even used a spring balance for tension and made sure of horizontal distance with a hand level. One of the more painful

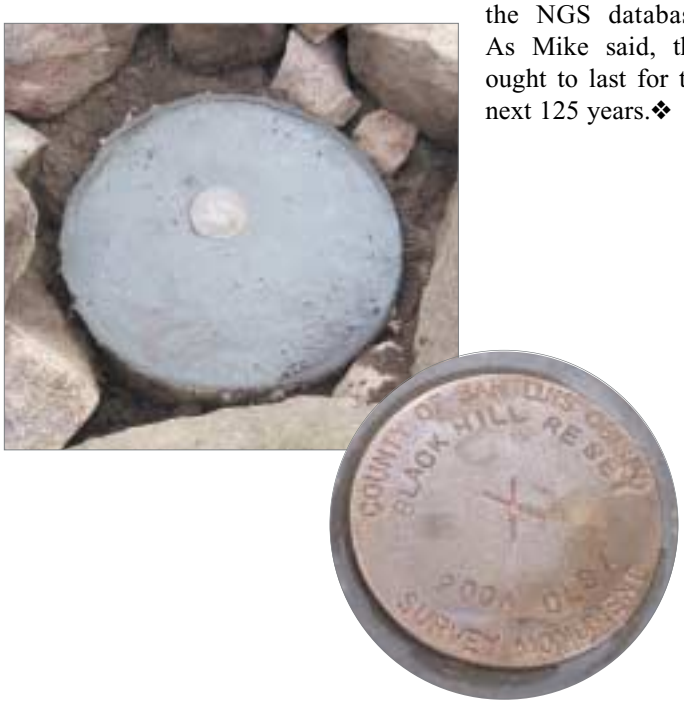


parts of the project wasn t packing concrete or water up the hill, it was trying to remember how to pull a good distance with a tape, spring balance and plumb bob.

We were visited, during our project, by several folks making the short journey up the hill for the vista it provided. They would ask about what we were doing, and after a polite look of interest would say That s nice , and move on. With the cleanup done the final thing to do was to get a photo, and pack back down the hill.

It was now noon, and everybody was hungry and thirsty. Lunch and a beer was had in town and the event was done.

Many thanks to those who contributed time, tools, materials and effort, and most of all to the Chapter for the support. When it is posted, you will be able to see the new description as part of the NGS database. As Mike said, this ought to last for the next 125 years.❖



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