

From: William Miesse [<mailto:montagne@snowcrest.net>]
Sent: Monday, February 27, 2017 10:52 AM
To: Crystal Geysler <crystalgeyser@analyticalcorp.com>
Subject: Herbicide comment for crystal geysler soils EIR

Dear MS Sawyer.

I live on Vista Drive off of Ski Village Drive and close to the proposed Crystal Geysler plant.

I do local history research and was surprised to find out that from 1962-1964 one of the first major herbicide testing programs in the US was conducted just about 3/4 of a mile due north of the proposed caretaker residence. I couldn't find any reference to this important aspect of the soils in the draft EIR so I thought I'd bring it up, albeit it poses poor public relations for both the City Park springs and the proposed marketing of bottled water. The health issue overrides those lesser issues.

If you get into the fine print of several of the reports from that 1962-1964 program you will see that experimental excessive amounts of mix of 24D and 245T resulted in complete destruction of the plant growth on a few of the .2 acre plots among the approximately 108 test plots. The varied low to high applications of herbicide mix allowed graded regrowth on the plots that was later studied for nearly 3 decades. Dow Chemical most likely supplied the herbicides (a 50-50 mix of 24D and 245T was called 'agent orange' when sprayed during the very same years in Vietnam). My concern is whether or not the **persistent** organic carcinogen called Dioxin was contaminating the mix and whether or not traces of this substance remains in the soil, detectable or not by current technology. Again, I live close by and wish I had know of this before I purchased a residence in the area.

The proposed caretaker residence would be the closest residence to the test plots. Anyone living close to the test plots should be apprised of the possible health concerns. The fact that the 1962-1964 and other later testing programs were conducted directly over the the recharge area for the Mount Shasta City Park headwaters springs is another issue. I might remind you that this testing program and others like it in the immediate vicinity (using paraquat and picloram) were not practical applications of herbicide, but were testing programs to see what was most effective in killing plants and not killing trees- they went overboard on some plots in the interest of science. Locating and testing of the hot spots should be done for dioxins, and for Picloram; if not done it would be remiss.

here's a link to a pdf of a good report on the 1962-1964 program: <https://www.treesearch.fs.fed.us/pubs/30603>

here's a link to a pdf of the 30 year follow-up study https://www.fs.fed.us/psw/publications/documents/psw_rp231/psw_rp231.pdf

here's a link to the Picloram study at 3900 feet - (up to 160 lbs per acre equivalent on .1 acre plots) I don't know the exact location of this site but due to the 100 foot lower elevation it might be even closer to the Crystal Geysler property. <https://www.treesearch.fs.fed.us/pubs/31101>

To find the specific 'hot' herbicide plots for Bentley's 1962-1964 tests I would think that the original unpublished study papers are at the Pacific Southwest Forest and Range Experiment Station in Berkeley, CA - I checked with Redding station and they were only able to supply a few unpublished documents from McDonald's 30 year follow-up study. I have not yet contacted the Berkeley station.

It seems like this 4000 foot elevation area around Spring Hill was used for some other herbicide and biological weed control tests as well- for example Joley, 1987 (Joley, Donald B. Biological Control of Musk Thistle by *Rhinocyllus conicus* at Mt. Shasta, Siskiyou County, 1980-1985) mentions chemical treatment for a year at a "South Spring Hill" site prior to natural control testing beginning in 1974.

I have maybe 10 or so pdf's of reports on these studies, if you want the links I have let me know

Thanks

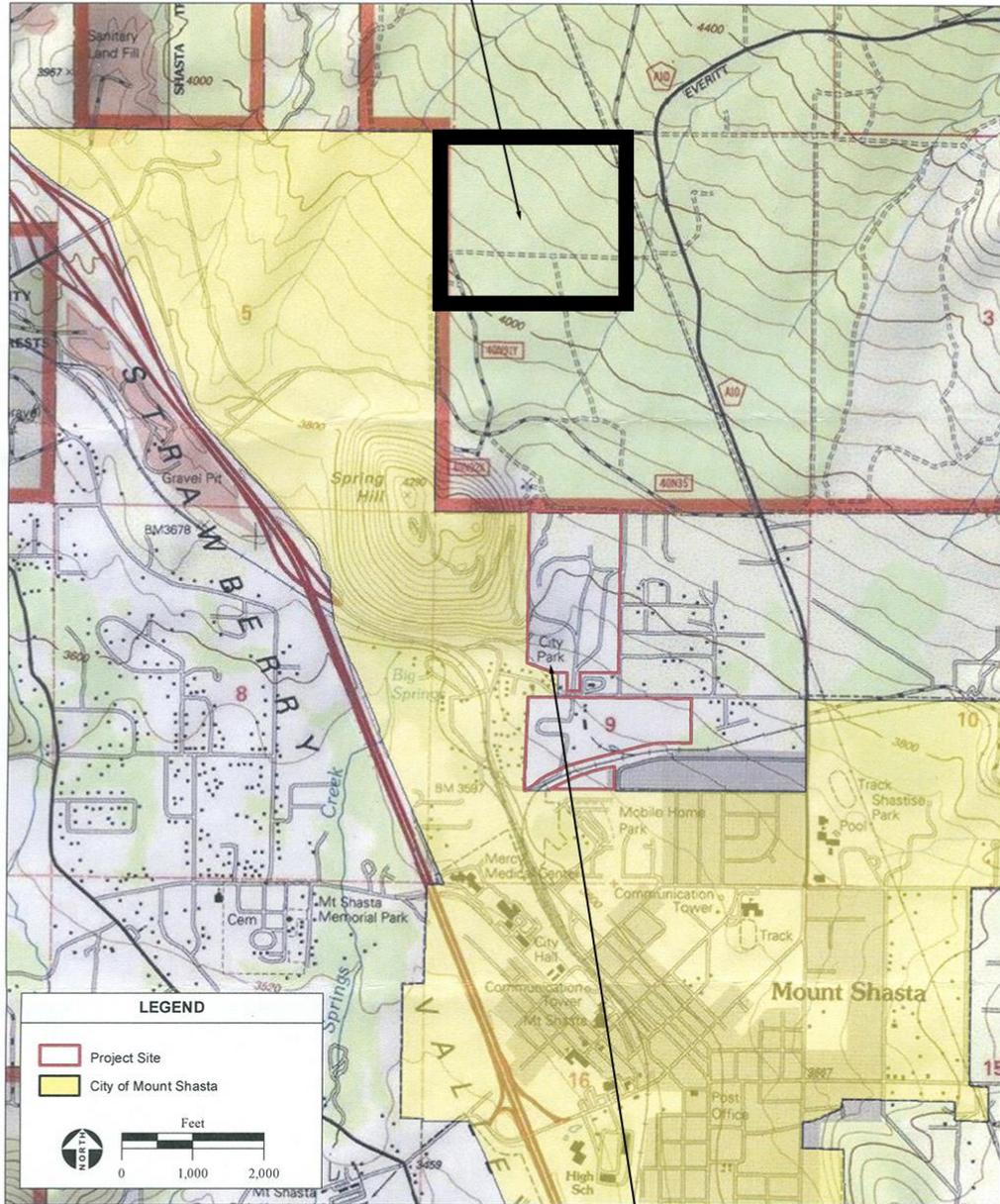
Bill Miesse

SIGNIFICANCE OF BENTLEY'S AND LATER MCDONALD'S STUDIES ACCORDING TO THE 2012 MOUNT SHASTA WATERSHED ANALYSIS:

"The Spring Hill Plantation study (T40N R4E, NW 1/4 of Section 4 MDM) marks some of the earliest herbicide trials in western forestry and perhaps the oldest designed study of how shrub control affects the long-term development of young forests. In 1961 the site supported dense thickets of manzanita, snowbrush, Sierra plum and bitter cherry that established following logging and subsequent wildfires in the late 19th century. Thirty acres were cleared with a bulldozer in 1961 which meant that shrubs and an estimated 4 to 6 inches of topsoil were pushed into windrows. The cleared bays between windrows were planted the following year with ponderosa pine, which led to survival of the trees, but tree growth was stunted from brush reinvasion and from "L-rooting" occurring during machine planting. Following planting, Jay Bentley and coworkers of the California Forest and Range Experiment Station (now the PSW Research Station) conducted formulation, rate, and timing trials with herbicides to test their effectiveness at controlling shrubs. Treatments were applied to rectangular plots each about 0.2 acres, sandwiched in the cleared bays between windrows. Bentley's trials were completed in 1964 leaving plots with varying densities of shrubs. In 1966 Philip McDonald of the PSW Station chose four plots in each of four shrub density categories and monitored vegetative changes periodically for the next 3 decades. McDonald's work established one of the earliest experiments in the West of how vegetation control influences plantation development, and led to many papers and presentations. With McDonald's retirement, half of the treatment replications were obliterated when windrows were flattened and re-spread by the District, however, half still remain. They serve as remarkable demonstrations of the long-term effects of shrub competition on forest development. (Mt. Shasta Watershed Analysis: Shasta-McCloud Management Unit Shasta-Trinity National Forest, 2012, p.108) "

overlay on map to accompany
wcm air comments

A subset of Bentley's Herbicide Testing
Plots 1962-1964 were followed up by
McDonald for 30 years in "T40N R4E,
NW 1/4 of Section 4 MDM"



**fyi CITY PARK label is
incorrectly located on this map**

SOURCE: "City of Mount Shasta, CA" USGS 7.5 Minute Topographic Quadrangle,
T40N, R4W, Sections 9, Mt. Diablo Baseline & Meridian;
ESRI Data, 2016; AES, 6/17/2016

Crystal Geyser NOP / 216537 ■

Figure 2
Site and Vicinity