

HOW DID HATFIELD CONSULTANTS GET INVOLVED IN AGENT ORANGE/DIOXIN IN VIET NAM?

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In the late 1980's in British Columbia, Canada it was determined by government authorities that Kraft pulp mill waste-water effluents contained dangerously high levels of dioxin stemming from the use of chlorine in their bleaching process. Dioxin was found in marine/freshwater sediments and biological organisms inhabiting waterways associated with these pulp mills. Health Canada, as a result of potential health hazards, closed vast areas of the marine environment to fishing and human consumption of biological tissues contaminated with dioxin.

Hatfield Consultants (Hatfield) was initially contracted by the pulp mills in 1989 to monitor the levels of dioxin contamination in marine and freshwater environments supporting these industries as major changes were mandated by the Canadian government to terminate the use of chlorine as a bleaching agent. Alternate bleaching chemicals were implemented ... such as chlorine dioxide. Hatfield has continued to monitor specific mills from that date to the present.

In the early 1990's, the two principals of Hatfield (Mr. Chris Hatfield and Dr. Wayne Dwernychuk) received support from the Canadian government to open a Hatfield office in Bangkok, Thailand. An initiating project was selected wherein sampling of a select area in Viet Nam was targeted. With Hatfield's experience in dioxin research in Canada, it was a natural transition to address the Agent Orange/dioxin issue in Viet Nam.

In October 1994, Mr. Hatfield and Dr. Dwernychuk visited Ha Noi and met with Professor Hoang Dinh Cau, Chairman of the 10-80 Committee, the government body at that time in charge of Agent Orange/dioxin research in Viet Nam. Hatfield representatives and Professor Cau developed a close working relationship and sincere friendship that fostered many successes in collaborative Agent Orange research, which continued until his death a few years ago. The early successes of Hatfield can be attributed to the hard work and dedicated efforts of other Vietnamese working closely with Professor Cau in the 10-80 Committee, including Dr. Le Cau Dai, Dr. Hoang Trong Quynh, Dr. Tran Manh Hung, and Dr. Phung Tri Dung.

Over the course of two years, subsequent to Hatfield's first introduction to Viet Nam in 1994, numerous meetings were held to engage local scientists

and government departments. Following a two-year planning stage, the Canadian/Vietnamese team decided to undertake Hatfield's first study in country, in A Luoi District, specifically the A Luoi Valley, approximately 65 km west of Hue. During the war, A Luoi Valley was known as the A Shau Valley, an important segment of the Ho Chi Minh Trail, immediately south of the former Demilitarized Zone (DMZ) which separated the former North and South Viet Nam. The A Shau Valley was the site of one of the major battles of the Viet Nam conflict ... Hamburger Hill (http://en.wikipedia.org/wiki/Battle_of_Hamburger_Hill).

The objectives of the study were to determine dioxin levels in the environment and human population in the Valley, which included those areas that were sprayed by US aircraft (fields and forests), and areas that were used by the US military for their Special Forces Camps. Three such bases existed in A Luoi Valley during the war ... A So (known as the A Shau Special Forces Camp during the war), Ta Bat, and A Luoi. The A So base was in operation for the longest period of time before being overrun by North Vietnamese forces (http://en.wikipedia.org/wiki/Battle_of_A_Shau ... <https://www.youtube.com/watch?v=FKB8KQbQIZY>). It was also the site of extensive Agent Orange use.

Hatfield and Vietnamese scientists randomly selected sampling sites in A Luoi Valley including soils, sediments from fish ponds, a variety of foods (e.g., fish, ducks, chickens, rice, manioc, pork, and beef), human blood, and human breast milk. All samples were sent to Canada for laboratory analyses.

Dioxin data generated in the Canadian laboratory revealed a clear pattern of dioxin contamination in the Valley. Those areas sampled on the former US bases exhibited the highest levels of dioxin, with the A So base (the one in operation the longest) recording the highest levels of the three bases. Areas that were sprayed by US aircraft (farmer's fields and previously forested areas) had markedly lower levels of dioxin contamination.

At that point in time, the Hatfield investigations were the most 'systematic' and 'comprehensive' studies ever undertaken in Viet Nam focusing on dioxin contamination. Hatfield/10-80 Committee studies were unique in that they not only addressed the issue of site-specific sampling data gained from a variety of environmental media, but they included the 'integration of ecological consequences' of Agent Orange use in A Luoi Valley by following dioxin in the food chain from contaminated soils, into contaminated fish pond sediments, into contaminated fish (and ducks that used these ponds), and ultimately into humans who consumed these fish/ducks. Clear evidence of this contaminant pathway was revealed, with the origin of dioxin in this pathway being Agent Orange, without any doubt. These studies centred on a single, relatively isolated geographic region, with no confounding variables (e.g., industrial operations) in this agrarian hill-tribes

region, and integrated the elements of this ecosystem into a model for the movement of the dioxin molecule throughout the various structural compartments of the A Luoi Valley ecosystem.

From the many years of research in the Valley, Hatfield scientists theorized that other former US military bases in southern Viet Nam, where Agent Orange was present and used, also had a high probability of significant dioxin levels. Team members hypothesized that what was discovered in the A Luoi Valley mirrored the situation that may exist in other areas of southern Viet Nam. The "Hatfield Hot Spot Theory" was proven through field validation studies in the A Luoi Valley, Thua Thien Hue Province in central Viet Nam. The 'theory' highlights those areas of Viet Nam where the most serious dioxin contamination is present ... the former US military bases where Agent Orange was stored, used, spilled, loaded onto aircraft, and washed out of herbicide tanks on spray aircraft.

Additional Hatfield studies were undertaken in the Ma Da Forest and Vung Tau, including the Mekong Delta and Central Highlands. These areas were sprayed by US C-123 aircraft. Dioxin levels in these soils were significantly lower than those levels recorded at the former US bases sampled by the Hatfield/10-80 Committee team. These data added further credence to the Hatfield Hot Spot Theory, and confirmed that areas aerially sprayed during the conflict were now nearing background levels for dioxin in the environment

With the financial assistance of the Ford Foundation, and the strong support of Mr. Charles Bailey (then of the Ford Foundation), studies were undertaken by Hatfield and the 10-80 Committee to assess former US military bases in southern Viet Nam as to their potential dioxin contamination. The military history (from the national archives in Washington, DC) and present environmental conditions, related to dioxin contamination, were studied at Da Nang, Pleiku, Phu Cat, Nha Trang, Bien Hoa, Can Tho, Tan Son Nhut and other areas in southern Viet Nam. This series of studies concluded that the former US bases at Da Nang, Bien Hoa, and Phu Cat are the most contaminated of the bases studied and should be considered significant dioxin 'hot spots', with recommendations to initiate remediation of soils as soon as possible. Situated in close proximity to these bases are significant numbers of people who, in some way, may be in contact with contaminated soils and/or food that may have originated on these former US bases. Concern for the health of local people is of primary concern. As a result, it is critical that the pathways of dioxin transfer to people are understood and measures are taken to prevent human contamination.

It should be noted that given the above bases were determined to be contaminated with dioxin many years following cessation of hostilities, these bases were therefore contaminated with dioxin during the war.

Consequently, any military personnel on these bases at that time had the potential to be exposed to high level of the dioxin contaminant.

Dioxin hot spots unquestionably exist today in Viet Nam, and are potentially contaminating human populations living in close proximity to these locations. The most significant hot spots have been identified. Hatfield recognizes that others may also exist which have not as yet been identified. However, Bien Hoa, Da Nang and Phu Cat require immediate remediation. These hot spots have very high dioxin levels due to significant quantities of Agent Orange use during the war, and the fact that these were key military bases for implementing Operation Ranch Hand, the code name for the US military herbicide program. A significant point is that Hatfield hot spots are not the vast forested areas targeted by routine flights of Operation Ranch Hand C-123 aircraft. In the now barren regions of A Luoi District, once consisting of triple-canopy jungle, and heavily sprayed with Agent Orange, soils do not retain high levels of dioxin, given years of tropical rains, erosion, and chemical degradation. Forces of nature have reduced dioxin in soils in those areas where defoliants were originally dispensed from aircraft during planned spray missions.

Hot spots that exist today include those areas where Agent Orange was spilled, applied by truck-mounted and back-pack sprayers, including intensive perimeter spraying of bases, and washed out of aircraft spray tanks, thereby adding high levels of dioxin to soils; levels that were significantly higher than that resulting from aerial spray applications. For example, on the Bien Hoa base in the early 1970s, a 7500 gallon spill of Agent Orange occurred. This event contributed significantly to the establishment of Bien Hoa as a present-day dioxin hot spot.

The Vietnamese government is working with haste to contain the dioxin contaminated areas near/on former US military bases labelled as hot spots. Dioxin contamination on the Da Nang airbase has received considerable international press following the discovery of significant contamination on the base and in local populations (especially in people fishing in Sen Lake, adjacent to the base). The Ford Foundation has contributed substantial finances to assess the extent of the dioxin contamination problem.

A cooperative program between US AID and the Vietnamese government is now progressing to remediate dioxin contamination on the Da Nang airport. Hatfield continues to be involved in remediation activities in cooperation with the US and Viet Nam.

Office 33 in Ha Noi is now the government entity in charge of Agent Orange issues in Viet Nam. Dr. Le Ke Son is Hatfield's primary contact and serves as Director of the department.

Hot spots identified by Hatfield (i.e., former US military installations) must be the focal point of studies to determine appropriate remediation measures,

in order to protect local populations. This strategy is particularly justified where former US military bases have been abandoned and are now sites of concentrated human activity. Remediation efforts must also consider topographical features near former US bases which facilitate downstream migration of contaminants (e.g., through runoff water) to areas presently used for food production by local inhabitants (e.g., fish ponds). These contaminated areas are logical sites for comprehensive epidemiological and human health investigations, including appropriate interventions.

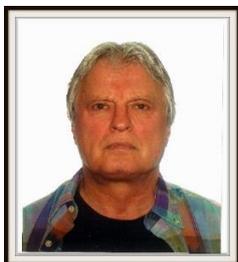
Although approximately 12% of southern Viet Nam was sprayed during Operation Ranch Hand, only very limited areas are now considered highly toxic due to dioxin contamination, specifically airbases formerly used by the US military. As dioxin in soil may remain toxic for many decades, and most likely for over a century, it is crucial that contaminated sites are identified and remediation measures implemented, ultimately to protect the health of local Vietnamese.

Viet Nam requires international assistance to address site specific Agent Orange/dioxin contamination throughout the country. It is hoped that as knowledge increases and the wounds of war continue to gradually heal, efforts will be adopted by the international community to address the dioxin issue in Viet Nam, and assist its people to live safely in those areas that were ravaged by the wartime herbicide, Agent Orange.

For those interested, the following link presents some photos of Hatfield activities in the A Luoi Valley and other regions of Viet Nam ...

<ftp://CIDA0866:HCLxza12@ftp.hatfieldgroup.com/>

At the bottom of the page is 'cutlines' ... click on this to receive a brief description of each photo. The prefix of each photo denotes who was responsible for the photo.



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