

OVERVIEW

This guide has been designed to assist veterans and their significant others in recognizing problems associated with herbicide exposure during the Vietnam war.

Much of the very dense jungle vegetation in South Vietnam was used as cover by the Viet Cong and North Vietnamese Army. A means of counteracting this tactic was the use of herbicides to kill and defoliate this dense vegetation. In addition, herbicides were also used to kill crops (the enemy's food supply), and to clear the perimeters around military installations, landing zones, fire base camps, river banks and trails.

The primary herbicide used for this defoliation was Agent Orange (named for the orange band encircling the 50 gallon drum containing the herbicide). Agent Orange was a 50:50 mixture of 2,4-D and 2,4,5-T. The latter component, 2,4,5-T was formed to contain the contaminant TCDD or 2,3,7,8-tetrachlorodibenzo-p-dioxin (i.e. dioxin). Also, unlike civilian applications which are diluted with oil and water, Agent Orange was sprayed undiluted in Vietnam. The concentrations were 6 to 25 times the manufacturer's suggested rate even though they were aware of the toxicity of the herbicide. Why? The best answer is Agent Orange was considered a life-saving weapon and any subsequent harm done was either viewed as directed at the enemy or in the case of "friendly" exposure, worth the price.

From 1962 to 1971 the United States military sprayed the herbicide Agent Orange by various means: fixed-wing aircraft (Operation Ranch Hand), helicopters, trucks, riverboats and individual backpacks. The fixed-wing and helicopter spray missions are contained in computer records (known as Herbs and Service Herbs tapes) and are readily accessible. However, a significant portion of the other spraying (trucks, riverboats and individual backpacks,) if recorded, are much harder to find and therefore document.

Widespread use of Agent Orange coincided with the massive build-up of United States Military personnel in Vietnam, reaching a peak in 1969 and eventually stopping in 1971. Thus, according to official Veterans Administration statistics, it was theoretically possible 4.2 million American soldiers could have made contact with herbicides including, "Agents" such as "Blue" & "White" that were also sprayed extensively in Vietnam.

The active components of Agent Blue, a clear yellow liquid, were cacodylic acid and the sodium salt of cacodylic acid. Agent White, a dark brown liquid was a formulation of picloram and 2,4-D. (See Appendix)

HISTORY OF THE COMMISSION

In 1980 the New Jersey legislature created the first state Agent Orange Commission in the United States. The mandate for the new Commission was broad: Study the effects of the herbicide Agent Orange on veterans and their children, collect data, provide information and coordinate a variety of services to these veterans.

Agent Orange was the code name used for a herbicide used extensively in Vietnam to deny the enemy concealment and food supplies. Over 17 million gallons were sprayed during the period 1965-1971. Veterans were exposed to this herbicide through direct contact and possible exposures through water and food chain contamination. The contaminants in the Agent Orange used in Vietnam were highly toxic - substances which have shown to be cancer causing in laboratory animals and have also caused birth defects in laboratory studies.

Agent Orange (AO) is one of several herbicide mixtures used in Vietnam. Other included Agents Blue, Green, Orange II, Purple and White - all named for the color band encircling their containers. Agent Orange has received the most attention due to its wide application and relatively great contamination with dioxins.

Agent Orange is a 50/50 mixture of the n-butyl esters of 2,4,5-T (trichlorophenoxyacetic acid) and 2,4-D (dichlorophenoxyacetic acid). During its manufacture, Agent Orange was contaminated with polychlorinated dibenzo-p-dioxins in varying amounts. The amount of contamination differed with the reaction conditions and purity of the reagents used in the synthesis. Of the many dioxins, 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD, or simply dioxin) has been implicated as the most hazardous component of Agent Orange (United States Department of Health and Human Services 1984).

The heaviest dioxin contamination of 2,4,5-T occurred during manufacture of the Agent Orange that was used early in the conflict during the height of American troop involvement in Vietnam. Despite the focus on dioxin, phenoxy herbicides (2,4-D and 2,4,5-T) themselves have been identified as chemicals with significant potential for causing serious illness.

Vietnam veterans, rightfully concerned about their health and the health of their children, found no solace with the federal government. Their concern for their children grew as increasing numbers of veterans' children were born with birth defects. Others, worried about the possibility of bringing children with birth defects into the world, deliberately had no children. For years, the government not only denied that veteran's health problems were related to herbicide exposure, but challenged veteran's claims that they were even exposed to Agent Orange.

The new Commission in New Jersey faced a formidable challenge: little information existed about human effects of herbicide exposure, and the federal government and industry were steadfast in denying that a problem existed. The New Jersey Agent Orange Commission became the only government entity to advocate for these veterans.

During the early years of the Commission's existence, Commission members and staff "reached out" to veterans where ever they could be found, sharing information and listening to the problems of these veterans, trying to learn the depth and breadth of these problems as they traveled around the state.

The New Jersey Agent Orange Commission soon became a focal point for Vietnam veterans, first from New Jersey and later from other states as the word spread that there was an agency that cared.

When an agency interfaces with people, it gets the whole person, not one particular part. The Commission soon found itself dealing with all aspects of the Vietnam Veteran: Post Traumatic Stress Disorder, Employment, Unemployment, Underemployment, Substance Abuse, Bad Discharges, Marital Problems, Family Problems, and incarcerated veterans. Many veterans were expressing growing concerns about their children's health problems. There was no state of federal "clearinghouse" to deal with these problems. so veterans called and wrote the Commission seeking help. The Commission became a "seat of the pants" social service agency by default.

Over the years the Commission has worked with literally thousands of veterans offering assistance in all of the above mentioned areas through referrals, advice, and direct intervention. By word-of-mouth the Commission began hearing from veterans needing help from virtually every state in the union.

Becoming aware of the magnitude of the problems of Vietnam veterans, the Commission began to lobby the federal government. Commission members and staff were among the first state agencies to testify for the need for increased federal assistance at Congressional hearings. Working closely with New Jersey Congressmen and Senators, the Commission was highly instrumental in focusing federal attention on the problems of Vietnam veterans.

The Commission realized that advocacy, no matter how effective, was not the sole answer to the Agent Orange question. The federal government would not accept the health claims of veterans based on opinion alone. Scientific proof that dioxin exposure was related to these problems was demanded. In 1984 the Commission boldly stepped into the world of research.

POINTMAN I

Dioxin research is among the most complicated in the Biosciences. In 1984 when the Commission began its research effort critics said that low levels of dioxin could not even be detected in human beings years after exposure. Before any effort to understand the health effects of dioxin exposure could be undertaken, a research effort must first determine whether or not any detectable levels of dioxin could be found in Vietnam veterans believed to have been exposed to Agent Orange.

The Commission called this initial research effort "POINTMAN". The primary reason for selecting this name was a battlefield recognition to service in Vietnam. The infantryman who led his patrol through the bush was the "Pointman" - cut front, often the first to confront the enemy.

Similarly, in dioxin research, Vietnam veterans who were exposed to Agent Orange and other herbicides were "Pointmen" for the rest of society. Dioxin and other related compounds are found in the manufacture of many chemicals in industry with the waste product often ending up in toxic waste sites. These Vietnam veteran "Pointmen" who were exposed to Agent Orange may be the first to teach us the effects of chronic dioxin and related herbicide exposures among the general public.

Indeed, this research could also be used to further substantiate animal studies. As stated by Admiral Eino Zumwalt in his statement before Congress in June, 1990 "There is now clear consensus among epidemiologist, toxicologist and immunologists that 2,4-D, 2,4,5-*s* and 2,3,7,8-TCDD (the dioxin contaminant) found in Agent Orange, are extremely toxic to animals. Numerous laboratory experiments confirm that dioxin causes a variety of cancers, birth defects, neurological, immunological and other disorders in animals" (Statement of Admiral E. R. Zumwalt, Jr. before the Human Resources and Intergovernmental relations subcommittee of committee on government operations United States House of Representatives June 26, 1990).

Under the direction of original Commission members and the principal investigator, Dr. Peter C. Kahn of Rutgers University, the Pointman I project officially kicked off in December 1984. This first phase was a pilot project to determine if low levels of dioxin could be detected in the adipose tissue and blood of veterans 15 to 20 years after exposure.

Tissue and blood samples were taken from a selected group of veterans and were shipped to the University of UMEA in Sweden where they were analyzed using state-of-the-art analytical techniques developed by Dr. Christofer Rappe at that university.

The results of Pointman I were spectacular. The analysis done in Sweden found dioxin levels in the exposed veterans as much as ten times higher than in matching controls. The veterans studied in Pointman I were men who had direct contact with Agent Orange:

spray handlers from the Air Force "Ranch Hand" program and members of the Army Chemical Corps.

The manuscript for this phase of the project was published in the prestigious Journal of the American Medical Association (JAMA) in its March 1988 edition.

For the first time, - it could be proven - not only were veterans exposed to dioxin, but residual levels could still be detected in their bodies, as much as 20 years after exposure.

POINTMAN II

An important next phase of the research was to determine whether or not elevated dioxin levels could be found in veterans who did not handle the chemicals but had been exposed in other ways. This next phase was appropriately named Pointman II.

In 1987, the Commission received a \$675,000 appropriation to begin "POINTMAN II". The principal thrust of this appropriated money was to expand on the results of Pointman I and also, to study Army and Marine ground forces and men who served in the Navy river patrol boats. In addition to dioxin analysis of the blood, medical, psychological and neurobehavioral test batteries were added to the testing protocol to begin looking for health anomalies in the veterans tested. These testing protocols were designed as pilot studies - to test this feasibility of large scale testing of veterans by the federal government in the future.

Pointman II proved to be an arduous and complicated project. Approximately 20 veterans were carefully screened for each one finally selected. Testing protocols were evaluated, re-evaluated and modified. The project was expanded from its original design and in 1989 the New Jersey Legislature appropriated an additional \$800,000 to complete this phase of the project.

In September 1990 the Commission held a press conference to announce preliminary results of Pointman II. As with Pointman I, elevated dioxin levels were found in two of the groups tested, the Navy River Boat Personnel and the Marines. In many ways these results were even more dramatic than in the original

Pointman, because they proved that veterans in the field were exposed to the herbicide and continued to have residual levels of dioxin in their bodies.

The non-dioxin testing of Pointman II is still being evaluated. We expect to release the results of additional isomers in the blood, semen analysis and neurobehavioral data during 1993.