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Operation Red Hat: Chemical weapons and the Pentagon smokescreen on Okinawa 赤帽作戦 化学兵器と国防省が沖縄に張った煙幕

by [Jon Mitchell](#)

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Introduction

In July 1969, a leak of chemical weapons on Okinawa sickened more than 20 U.S. soldiers and laid bare one of the Pentagon's biggest Cold War secrets: the storage of toxic munitions outside of the continental United States.

Public outrage following the Okinawa accident forced the White House to launch Operation Red Hat — codename for a mission to remove the chemicals from the island.

For more than four decades, details of that project have been kept firmly under wraps. But now, newly disclosed scientific studies — and accounts from U.S. veterans who participated in Operation Red Hat — are casting light on the mission and exposing what truly occurred. These revelations include the alleged dumping of chemical weapons off the coast of Okinawa, the presence of the potent blister agent, lewisite, and the inclusion of Agent Orange — the Vietnam War defoliant which the Pentagon denies was ever present on the island.

Chemical weapons on Okinawa

In July 1969, as the eyes of the world were focused on Neil Armstrong's mission to the moon, U.S. service members and residents on Okinawa had war on their minds.

Since 1945, the island had been under U.S. rule, and by 1969 the Pentagon's "Keystone of the Pacific" was the primary staging post for the conflict in Vietnam. Ships from the U.S. funneled troops and materiel through the island's ports while Kadena Air Base in central Okinawa had become the world's busiest airport as massive B-52s bombers took off from its runways to rain death and destruction across much of southeast Asia.¹

Unknown to most people on Okinawa — service members and civilians alike — the island was also bristling with the full spectrum of America's weapons of mass destruction, including hundreds of nuclear warheads and a large arsenal of chemical munitions.

By then, most countries had renounced the use of toxic weapons under the 1925 Geneva Protocol, but during the Cold War both the U.S. and the Soviet Union cranked up their production. In fact the first U.S. chemical weapons were taken to Okinawa during the 1950-53 Korean War, with further shipments between 1962 and 1963.² The stockpile was widely assumed by leading historians of chemical warfare, including Jonathan B. Tucker — author of a 2006 comprehensive history of those munitions, *War of Nerves* — to consist of three main substances: mustard agent, sarin and VX.³

First deployed in World War I, mustard agent is an oily liquid smelling more like garlic than the kitchen condiment after which it was named; upon contact with the skin, it triggers large blisters. It also has the potential to damage DNA and can be lethal.

Sarin, named from the initials of its Nazi German creators, is a nerve agent — the most deadly family of chemical weapons. It causes violent muscle contractions that lead to death from asphyxiation. When Aum cultists released 5 kg of 30-percent-pure homemade sarin in the Tokyo subway system in 1995, 13 people were killed and more than 1,000 injured.

VX is a variant of nerve gas that was the most powerful poison in the U.S. arsenal when it was created in the mid-1950s — with just 1 kg of the substance able to take the lives of hundreds of thousands of people. In 1969, according to later newspaper reports, including in the *New York Times*, an estimated 1.9 million kg (1,900 metric tons) of VX was stored on Okinawa.⁴

The U.S. chemical weapons arsenal was stockpiled at Chibana Ammunition Depot, a hilltop installation next to Kadena Air Base. Access to the sprawling depot was tightly controlled, but a herd of goats was given free rein in the hope that any untoward behavior by those animals could warn of a possible toxic leak. In the storage bunkers, meanwhile, there were caged white rabbits whose bulbous pink eyes would show pinpricked pupils — one of the initial signs of nerve-gas exposure — if an accident occurred.

However, the depot's animal early-warning systems were unable to prevent what happened there on July 8, 1969. Although the Pentagon has never officially disclosed details of the accident, it is possible to infer a picture of events from U.S. officials' memoirs.

July 1969: The Leak on Okinawa

In his 1979 book "White House Years," Henry Kissinger — who, in 1969, was U.S. President Richard Nixon's national security adviser — blamed the accident on an unnamed U.S. army major whose "aesthetic sense exceeded his judgment" as he ordered a maintenance crew to sandblast the chemical munitions' containers prior to repainting them a different color.⁵

The work caused one or more of the munitions containers to leak their contents — though to this day experts disagree whether it was sarin or VX. Twenty-three troops and one American civilian were exposed and hospitalized with mild symptoms of contamination. Some were released that day, while the most seriously affected — in what must have been a miniscule release — took a week to recover.

According to a report in U.S. archives of Okinawa High Commissioner Lt. Gen. James Lampert's oral debriefing when he left Okinawa in 1972, he first learned of the accident when he was woken on the night of July 8, 1969, by a phone call from Maj. Gen. Chuck Horner, the U.S. Army officer in charge of the weapons (who was possibly also the unnamed officer mentioned by Kissinger). Lampert's report was quoted as saying Horner suggested the damaged munitions be dumped at sea, but the high commissioner said he would need permission from the Pentagon first.⁶

As far as is known, Lampert's account made no further mention of the proposed sea dump — and it seems certain the Pentagon would have hidden the accident had a *Wall Street Journal* reporter not got wind of it and published a front-page story on July 18, 1969.⁷

The article sparked fury on Okinawa — and also humiliated the U.S. government just as it was striving to claim the moral high ground in Vietnam and fend off international accusations that its widespread use of CS gas and Agent Orange in that conflict amounted to conducting illegal chemical warfare. At the same time, Washington was embroiled in tense negotiations with Tokyo over the return of Okinawa - including the fate of the Pentagon's nuclear arsenal on the island.

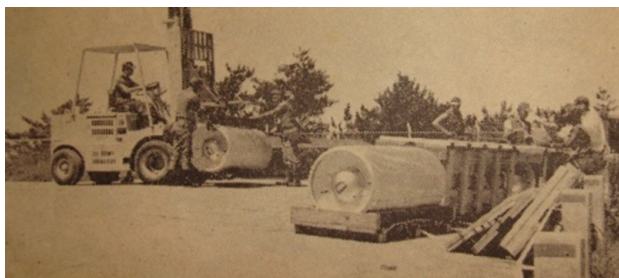
Four days after the Wall Street Journal article ran, the U.S. announced it would remove all chemical weapons from Okinawa as soon as possible. After that, with so much international attention focused on the island, Washington launched a public relations campaign to reassure the world that it would remove the munitions safely. At its core was a cheery propaganda reel titled "Operation Red Hat — Men and a Mission."⁸

In the film, the narrator explains that the project's name was selected "by a little old lady in tennis shoes working at the Pentagon" — and in keeping with that sugar-coated approach, bright-red hard hats and cute pin badges were issued to service members assigned to the project.

Operation Red Hat

Despite the Pentagon's pledge to act quickly — and the indisputable risks of retaining its leaky arsenal at Chibana in densely populated central Okinawa near Koza (now Okinawa City)— it took a full 18 months for the first phase of Operation Red Hat to begin.

According to the film "Men and a Mission," in January 1971, nine trucks carrying chemical weapons drove the 11 km from Chibana to Ten Gan Pier, a long jetty on Okinawa's east coast. Seven months later, in early August, the U.S. military embarked upon the second phase of the operation, which involved transferring the bulk of its chemical arsenal. This time, a team of 150 drivers worked non-stop 14-hour shifts for 38 days to transport 1,213 trailer-loads of munitions from Chibana to Ten Gan Pier. In sum, the chemical mines, rockets, bombs and barrels added up to 13,000 tons



Forklift truck drivers load chemical munitions – identical to those dumped by James Spencer – during Operation Red Hat. Tim Gravely

Tim Gravely, one of the soldiers who helped to load the ships at Ten Gan Pier, still well remembers the sense of danger surrounding the project.

"Just in case there was a leak, they gave us large hypodermic needles to wear on our belts. We were supposed to hit ourselves on the leg and the needle would shoot out, injecting medicine," he said in a recent interview.

The syringes probably contained atropine, an antidote to nerve gas, and Gravely came close to using it on Aug. 25, 1971, when a crane dropped 15 chemical rockets into a ship's hold.

"Five or six guys jumped on my forklift and we drove off as fast as it would go to get off the pier. I didn't want to have to use those needles because they were so nasty looking," Gravely recalls.

Nobody was injured in the incident — the rockets were later reported by the U.S. media to be packed with sarin — and there were no further accidents logged

throughout the operation.

According to the Pentagon, the last of the toxic munitions left Okinawa on Sept. 10, 1971, headed way across the North Pacific to Johnston Island, a 1.03 sq. km atoll with no population, which lies 1,390 km off the Hawaiian islands and was then, like Okinawa, entirely under military jurisdiction.

On the stern of the final ship to leave Ten Gan Pier, soldiers hung a large sign painted with the "Loony Tunes" catchphrase, "That's All Folks!" Following its departure, Okinawan officials scattered handfuls of salt to ritually purify the area.



The banner hung on the stern of the final Operation Red Hat ship to leave Okinawa. Tim Gravely

The Truth Beneath Operation Red Hat

The bright-red hard hats; the badges; the movie: At the time, the PR campaign accompanying Operation Red Hat was unprecedented in U.S. military history. Now, more than four decades later, the reasons for this seem clear: It was a smokescreen designed to camouflage what truly occurred during the removal of those chemical munitions.

Among the first ruses seems to have been Kissinger's claim that the 1969 leak at Chibana was the fault of an unnamed major whose "aesthetic sense exceeded his judgment."

His assertion detracted from the grim reality that, by the late 1960s, the U.S. military's chemical weapons had fallen into deplorable disrepair. According to Tucker, in "War of Nerves," during the mid-1950s the U.S. Army had cut corners in its sarin production process to save money.⁹ This led to a less-pure concentration that, being acidic and laden with heavy metals, started to eat through the walls of the rockets armed with it. On Okinawa, the problem would likely have been exacerbated by the humid, salty air.

When such leaks occurred on bases in the United States, the military followed standard operating procedure for disposal: The defective containers were taken out to sea and thrown overboard (see below).

Indeed, that had been the procedure proposed to High Commissioner Lampert following the Chibana leak in July 1969 — and in the late 1960s, Okinawan newspaper journalists heard from their on-base sources that that's exactly what happened in the waters off Okinawa. However, when these reporters pursued the story, their informants suddenly clammed up for fear of losing their jobs.

Now, however, new evidence supplied by U.S. veterans who participated in the sea disposal of chemical weapons makes it possible to confirm those 1969 accounts.

According to former service members, an operation took place in autumn 1969, around two months after the Chibana leak. Tom Westfall was then serving with the 895th Military Police Company, and helped oversee the transportation of munitions from Chibana Ammunition Depot.

"It was an all-hands effort with cooks, supply clerks and road duty MPs manning intersections and escort duty. We all got the atropine training and were issued gas masks," Westfall said in an email interview last month.

Westfall and his fellow police officers monitored the route the trucks took to ensure there were no accidents and there was no interference from anti-base protesters. He recalls that there were six trucks in total and he'd heard what was going to happen to their cargo. "There were discussions about the stuff being dumped offshore and whether or not that was safe. Also about how long the barrels would last until they released the materials — and would the salt water disperse it?"

James Spencer, then a 20-year-old U.S. Army stevedore assigned to the 412th Transportation Company, stated in a recent interview that the destination of the trucks Westfall supervised was Ten Gan Pier. He said he accompanied what he'd been told by his superiors were chemical weapons as they were loaded onto a ship on which he then sailed.



Windswept Ten Gan pier as it looks today – the staging post for the alleged Okinawa sea dump of chemical weapons. Jon Mitchell

"The weapons were in large steel containers approximately 8 or 10 feet (2.4 to 3 meters) long and about 3 feet (90 cm) in diameter. Some of them looked corroded. We always wore a gas mask and rubber gloves when we were near them," Spencer added.

Like Westfall, Spencer was also issued with a syringe to administer an emergency antidote if the need arose (it didn't).

Spencer remembers what happened when the ship reached its designated dump location. "We used a winch to lift the containers out of the hold and then a large fork lift to push them overboard. I am not sure how many we dumped — it was a lot. The entire operation took 48 hours."

When approached for comment for this article, Pentagon-based U.S. Army spokesman, Dave Foster, said after a preliminary check of archives, that the army had found "no record of any disposal of chemical or conventional munitions in the autumn of 1969 off the east coast of Okinawa, nor on any other date."

However, Foster seemed to acknowledge the U.S. military's poor track record of documenting its marine disposal when he urged veterans to forward their allegations to the U.S. Army Historical Research Team at Aberdeen Proving Ground in Maryland so the site could be added to its archives. Since 2006, the team has been responsible for mapping U.S. military sea-dump sites around the world, and it supplies Congress with an annual report to mitigate the risks of these

toxins.

The Pentagon's lackadaisical approach to safety throughout the Cold War era extended to the way it transported chemical weapons in the two main 1971 phases of Operation Red Hat.

In 1997, scientists from the Edgewood Chemical Biological Center based at the Aberdeen Proving Ground ran tests on the containers used to ship the munitions from Okinawa to Johnston Island. They discovered that more than one in four — 26 percent — of them were mislabeled.¹⁰

Furthermore, the tests conducted on containers by Edgewood scientists suggested Okinawa had been the storage site of a chemical munition not previously suspected — one known as lewisite.

Designed to be more toxic than mustard agent, lewisite's immediate effects include uncontrollable vomiting — while in the long term it can cause blindness and permanent damage to the respiratory system. What makes lewisite particularly frightening is that it has been linked to dangerous levels of arsenic in fish many decades after being abandoned at sea (see below).

Moreover, it appears that yet another poison was omitted from officials' accounts of Operation Red Hat — the toxic defoliant Agent Orange.

In 1970, after almost a decade of use in Vietnam, the U.S. military was forced by Congress to stop spraying the substance after studies showed it caused birth defects and cancer. Following the ban, the U.S. had tens of thousands of barrels of Agent Orange to deal with — so it decided to send them to its default toxic dumpsite: Johnston Island.

Although the Pentagon vehemently denies that Agent Orange was ever present on Okinawa¹¹, more than 150 U.S. veterans have filed claims with the Department of Veterans Affairs that they were exposed to the substance on the island.¹² Among those claimants is stevedore James Spencer, who says he sprayed it near Ten Gan Pier in 1968 to clear undergrowth.

Official U.S. records cite the existence of a stockpile of Agent Orange in 1971 at Kadena¹³; while a U.S. Army-funded report about Johnston Island states that there were 25,000 barrels of Agent Orange on Okinawa some time prior to 1972.¹⁴

Considering the 1970 White House ban on Agent Orange, it seems the Pentagon may well have used Operation Red Hat as a convenient cover to ship its Okinawa defoliant stockpile off the island.

Donald Wilson, a former U.S. special forces Green Beret — who was interviewed for "I Sprayed Agent Orange on Okinawa," a TV Asahi documentary aired in Japan in October 2012 — stated that he had seen hundreds of barrels with Agent Orange's tell-tale orange stripes around them being loaded into the holds of one of the Operation Red Hat ships.

Julio Batista, a former U.S. soldier who helped offload chemical weapons on Johnston Island in 1972, also recalls seeing similar barrels. "There were herbicides involved in Operation Red Hat. The barrels I sat on were 55-gallon (208-liter) drums. Each drum was painted in the middle identifying the agent," Batista stated in an email in spring 2012. Batista believes that he and dozens of other service members stationed on Johnston Island were sickened from their exposure to toxins transported at the time.

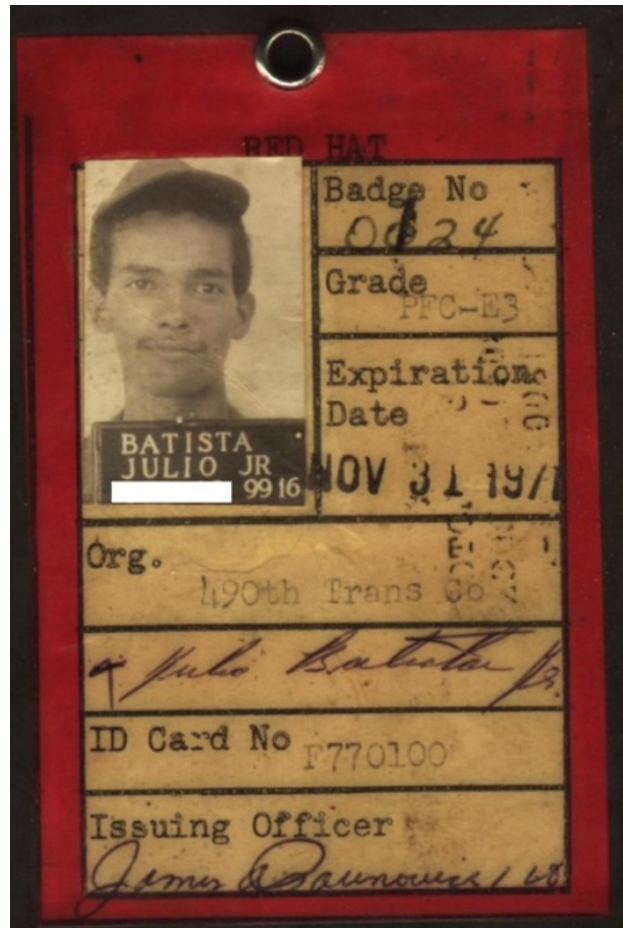
Corroboration that Agent Orange was shipped from Okinawa during Operation Red Hat has also come from an unexpected source: U.S. Air Force Gen. Richard B. Myers, retired Chairman of the U.S. Joint Chiefs of Staff (2001-05).

In 2004, Myers prepared a memorandum following Congressional enquiries into defoliant usage on Okinawa. Titled "Agent Orange/Operation Red Hat documents," it catalogs 18 reports spanning a period from August 1969 — the month after the Chibana leak — to March 1972. The list includes documents with tantalizing titles such as "Disposal of Herbicide Orange" and "Relocation of chemical weapons and agents from Okinawa."¹⁵

Repeated attempts since April 2011 to access those 18 reports — including requests under the U.S. Freedom of Information Act — have been stymied by the Pentagon. To date, of the 18 files on the list, only six have been declassified — and two of those contain dates that do not match those on the original list. The released files contain no information pertaining to Okinawa or chemical weapons.



U.S. service members work beneath decks ensuring the chemical weapons fit snugly together. Tim Gravely



Security badge of Julio Batista – the former soldier who sat upon barrels of Agent Orange shipped from Okinawa to Johnston Island. Julio Batista.



U.S. service members involved in the operation were all given tell-tale red hardhats. Tim Gravely

According to Lampert in his final report to Washington as high commissioner, dated May 14, 1972, Operation Red Hat was one of the U.S. military's "most controversial and emotionally charged projects." But Lampert also surmised there that it had been accomplished "with complete safety."¹⁶

Today, that optimism seems misplaced. A large number of the U.S. service members involved in transporting and storing those weapons on Johnston Island appear to have been sickened by their work; likewise, former service members believe they are ill from exposure to Agent Orange on Okinawa. The U.S. government has refused to help either group of veterans.

Ongoing contamination from these substances is another potentially lethal problem — one not only affecting the marine environment where the munitions were purportedly dumped, but also Chibana Ammunition Depot — today still a U.S. military facility now called Kadena Ammunition Depot.

The U.S. military has a long and nasty history of contaminating its bases on Okinawa — including the dumping of carcinogenic PCBs on Onna Communication Site prior to 1995; irradiating tiny Torishima Island with depleted uranium ordnance in 1996; and, most recently, it seems that fuels are contaminating the groundwater beneath Camp Kuwae.¹⁷

However, until now no one suspected that U.S. chemical weapons continued to

pose a danger.

In 1971, Okinawa officials rejoiced when the last of those munitions were taken away — but it seems it will require a lot more than salt to purify their island of the poisonous legacy of these weapons of mass destruction.

A drop in the ocean: the sea-dumping of chemical weapons in Okinawa

Accounts by U.S. veterans of tons of chemical weapons being dumped off Okinawa in autumn 1969 are the first time such revelations have been made public — but they tally entirely with the Pentagon's standard operating procedures at that time.

For almost as long as such weapons have been in existence, there has been a problem of what to do with them when they leaked or were rendered obsolete by new munitions. With incineration generally too dangerous due to the risk of toxic smoke, and burial requiring large tracts of land, the sea has often appeared to the military to be the ideal dumpsite — free, immense, anonymous, untrackable, and hopefully able to render poisons harmless by diluting them.

Following World War I, the Allied forces dropped stockpiles of captured German blister chemicals — mustard agent and lewisite — into the Mediterranean and the Atlantic Ocean. Then after World War II, the United States staged similar dumps of the Imperial Japanese Army's stocks of some 6,600 tons of munitions — including mustard agent and hydrogen cyanide, a potent asphyxiant. According to records held by the Ministry of the Environment in Tokyo, disposal was at more than 20 sites off Tokyo and Ibaraki and Hiroshima prefectures.¹⁸

During the Cold War, thanks in part to U.S. President John F. Kennedy's trebling of the U.S. chemical-weapons budget, the production of toxic munitions soared. With that increase came more pressure to dispose of redundant materials.¹⁹

To solve this problem the Pentagon turned to Operation CHASE (Cut Holes And Sink 'Em), a project already in existence to dispose of conventional armaments. Hence in 1968, according to publicly available Pentagon records, tons of mustard agent, sarin and VX were loaded into old ships that were scuttled off the U.S. East Coast.

But in the late 1960s, when the American public and nascent green movement became aware of such practices, Congress was called on to put a stop to them. Bowing to this pressure, in 1972, the U.S. Ocean Dumping Act became effective — prohibiting the disposal of chemical weapons at sea.

By this time, according to a 2010 report²⁰ by researchers from the Chemical and Biological Weapons Nonproliferation Program at the Monterey Institute of International Studies, California, the U.S. military had dumped roughly 300,000 tons of chemical weapons in the world's oceans — most at sites only roughly recorded or not at all, such as, it seems, the alleged 1969 chemical-weapons dumping off Okinawa.

But just how dangerous was this practice?

The U.S. military had calculated that dumping chemical weapons at sea would put an end to their dangers — but these poisons have repeatedly returned to haunt communities near such dump sites. In Japan alone, as of 2010, there had been more than 820 known incidents involving chemical weapons dumped in the postwar period; 400 people have been injured and more than 10 have been killed. Fishermen have borne the brunt of these accidents when their nets have trawled up sunken ordnance.²¹

According to the 2010 Monterey report, the potential risks of sea-dumped chemical weapons depend on the substance in question. While some agents are rendered inert almost immediately, others — such as the nerve agents sarin and VX, two of the substances thought to have been dumped off Okinawa — “are believed to persist for long periods in ocean waters.”

Additionally, a 2009 report by the same Monterey institute suggested that lewisite — another of the substances stored on Okinawa and possibly dumped off its coast — can contaminate marine life for decades.²²

In Europe, for example, lewisite dumped after World War I, was linked to “hazardous levels” of toxins in fish studied in 2005 — more than 80 years later.

Raymond A. Zilinskas, current director of the Nonproliferation Program at the Monterey institute, believes the munitions dumped in the sea near Okinawa pose a low risk to the public, but he is concerned about the possible involvement of mustard agent. “If the material was mustard, the surface would become a hardened complex (when exposed to sea water) that would protect the inner material. This would remain as toxic as when it was first produced,” he said in a July interview.

The persistent dangers of mustard agent were highlighted in 2004 when three U.S. Air Force bomb-disposal officers were injured handling a shell containing the toxin that had been dumped at sea in the 1940s or '50s quite close inshore off New Jersey.²³

On Okinawa during the late 1960s, there were a series of incidents that sparked residents' fears of chemical-weapons leaks. Those included a spate of mass fish deaths and the sickening of about 200 children after they'd been swimming in the sea near Ten Gan Pier.²⁴

U.S. authorities have always denied any chemical weapons stockpile of theirs played a role in such incidents. But according to the Monterey institute's 2010 report, “The risks may be higher today than when the dangers of the dumped material were first acknowledged because containment failure, due to corrosion, is thought to occur after 50 years.”

The alleged Okinawa dump took place 44 years ago — so if the report's estimates are accurate, the 3-meter-long metal tubes sunk from U.S. military vessels may well now be near to failing. Researchers also cite the risk that these weapons could be displaced by dredging, oil exploration or the laying of undersea cables.

Equally worrying for typhoon-prone Okinawa is the danger the munitions will be washed ashore and subsequently handled by unsuspecting beachgoers. The Japanese government has noted three such instances — most recently in Hiroshima in 1997.²⁵

In order to prevent such accidents, the public needs to be informed of both the risks these substances pose and where they were dumped. In the 1970s, after the Japanese government published a list of sites near the mainland where wartime munitions were disposed of in the postwar period, the number of accidents fell considerably.

In the case of Okinawa, such precautions require two factors.

First, the U.S. military archives need to be thoroughly searched to ascertain whether the precise site of the 1969 dumping at sea was recorded. More importantly, it will need to be open about the alleged 1969 dump and any other disposals that occurred.

With the risks so high, nothing less than full and immediate U.S. transparency will limit the ongoing dangers posed by what are some of the most deadly substances ever produced by humankind.

Okinawa Chronology

1952: The Treaty of San Francisco grants control of Okinawa to the United States. The U.S. sends its first shipment of chemical weapons to Okinawa for possible deployment in the 1950-53 Korean War.

1962-63: The U.S. sends further chemical-weapons shipments to Okinawa.

1969: A leak of chemical weapons at Chibana Ammunition Depot sickens 24 Americans. The U.S. government pledges to remove all stockpiles. Alleged sea dumping of these materials is carried out near Okinawa. U.S. President Richard Nixon announces the end of chemical-weapons production and pledges to use existing stockpiles only in retaliation.

1971: In what was codenamed Operation Red Hat, Okinawa's chemical-weapons stockpile is shipped to Johnston Island in the North Pacific, which is under U.S. control.

1972: Okinawa reverts to Japanese control. The U.S. Congress bans sea dumping of chemical weapons.

1977: The U.S. incinerates its stocks of Agent Orange near Johnston Island.

2000: The last load of U.S. chemical weapons taken from Okinawa to Johnston Island during Operation Red Hat is destroyed.

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Notes

- ¹ For more on Okinawa's role in the Vietnam War see Jon Mitchell, "The war legacy that binds Okinawa and Vietnam", Japan Times, November 11, 2011, [here](#)
- ² For a detailed history of the movement of chemical weapons to Okinawa - including allegations of their usage in the Korean War and tests on US service members on the island - see Jon Mitchell, "Were U.S marines used as guinea pigs on Okinawa?" The Asia-Pacific Journal, Vol 10, Issue 51, No. 2, December 17, 2012, [here](#)
- ³ Jonathan B. Tucker, War of Nerves, Anchor Books, New York, 2006, 220.
- ⁴ "U.S. to remove gas from Okinawa soon," New York Times, December 5, 1970
- ⁵ Henry Kissinger, The White House Years, Little, Brown and Company, New York, 1979, 331.
- ⁶ James B. Lampert, U.S. Military History Institute, Senior Officers Debriefing Papers, James and Williams Belote Papers.
- ⁷ "Nerve gas accident - Okinawa mishap bears overseas deployment of chemical weapons," Wall Street Journal, July 18, 1969.
- ⁸ Operation Red Hat : Men and a Mission is available to watch [here](#)
- ⁹ Tucker, 197.
- ¹⁰ "Analysis of Chemical Weapons Decontamination Waste from Old Ton Containers from Johnston Atoll Using Multiple Analytical Methods," Environmental Science and Technology, Volume 33, No. 13, 1999, 2157 ~ 2162.
- ¹¹ Jon Mitchell, "'Deny, deny until all the veterans die' - Pentagon investigation into Agent Orange on Okinawa," The Asia-Pacific Journal, Vol. 11, Issue 23, No. 2. June 10, 2013. Available [here](#)
- ¹² Jon Mitchell, 'US Military Defoliants on Okinawa: Agent Orange,' The Asia-Pacific Journal Vol 9, Issue 37 No 5, September 12, 2011. Available [here](#)
- ¹³ Jon Mitchell, "Herbicide Stockpile at Kadena Air Base, Okinawa: 1971 U.S. Army report on Agent Orange," The Asia-Pacific Journal, Vol 11, Issue 1, No. 5, January 14, 2013. Available [here](#)
- ¹⁴ Jon Mitchell, "Agent Orange on Okinawa - The Smoking Gun: U.S. army report, photographs show 25,000 barrels on island in early '70s," The Asia-Pacific Journal, Vol 10, Issue 40, No. 2, October 1, 2012. Available [here](#)
- ¹⁵ See Mitchell, 2011
- ¹⁶ James B. Lampert, "Final Report of High Commissioner", Naha Prefectural Archives, 8.

¹⁷ "Tainted soil detected at ex-U.S. land in Okinawa", Japan Times, June 22, 2013.

¹⁸ Ryo Sato, "Sea-Dumped Chemical Weapons: Japan", Global Green USA, June 2010.

¹⁹ Tucker provides a fascinating exploration of the growth of nerve gas production and the subsequent confusion over how to dispose of these substances - in particular see Chapter 11 - Incident at Skull Valley, 203-223.

²⁰ Joshua Newman and Dawn Vertugo, "Building Awareness of Sea-Dumped Chemical Weapons", Chemical and Biological Weapons Nonproliferation Program at the Monterey Institute of International Studies, California, 2010.

²¹ Sato, 11.

²² Caroline Ong., et al., "Chemical Weapon Munitions Dumped at Sea: An Interactive Map" Chemical and Biological Weapons Nonproliferation Program at the Monterey Institute of International Studies, California, 2009. Available [here](#)

²³ "The Deadliness Below", Daily Press, October 30, 2005.

²⁴ "Nerve gas accident - Okinawa mishap bears overseas deployment of chemical weapons," Wall Street Journal, July 18, 1969.

²⁵ Sato, 13.

²⁶ *Ibid.* 16.