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Chapter 1 : The U.S. Military's Toxic Legacy in Korea - Zoom in Korea

NATO Advanced Research Workshop on "Environmental Contamination and Remediation Practices at Former and Present Military Bases was held on October at the "Villon" hotel in Vilnius, Lithuania.

In addition, we publish today a sixth important article on Okinawa: This paper examines this difference between Japan and Korea in the interpretation of SOFA and makes some recommendations, based on the Korean experience, for environmental restoration of US military bases in Okinawa. In other words, the US Government is exempt from the responsibility to restore base lands to their original condition. Therefore in Japan, both the central and prefectural governments, and local governments hosting US military bases, share a concern over this US exemption. In Korea, the Government - at least the Department of the Environment, the judiciary, and many people - believe that the US is responsible for the environmental restoration of returned bases. Why is there such a difference in the interpretation of the same article of SOFA by the governments in the two countries? It is important to clarify the reason and prepare appropriate steps for the environmental restoration of US military bases south of Kadena at the time when they are returned to Okinawa. As a result of the return of many former bases, site cleanup problems have been highlighted and many negotiations have been carried out by the two countries about how to accomplish environmental restoration. The basic position of the Korean side is that the US is responsible for environmental restoration. That is clearly shown in the following two cases. First, on May 25, Environment Minister Lee Chi-beom told US Ambassador Alexander Vershbow that the US proposal to remedy returned bases² was not sufficient and indicated that the responsibility for environmental restoration lay with the United States. This interpretation of the Article by the Korean Constitutional Court is shared by many Korean specialists. However, at least in Japan, the US Government has never paid site cleanup costs for former military base land. However, little progress has so far been made in the cleanup of ex-military bases to the level required by Korean legislation and the level of cost borne by the US remains far below Korean expectation. It is a clear case of double standard. Therefore there is an extreme difference in the awareness of problems between Okinawa and mainland Japan. Korea is quite different from Japan. There have been many environmental pollution incidents at Yonsan, including the intentional discharge of a massive amount of formaldehyde from the mortuary into the Han River on February 9, , an incident that shook the country because it meant pollution of the source of the drinking water for one third of the population. It may be a major cause of the difference in interpretation of the SOFA article that in Japan US military base problems are regionally concentrated in Okinawa, while in Korea they are shared nationwide with a major presence in the capital. Although Korean specialists emphasize the special meaning of this Memorandum, almost the same agreement was reached four months earlier between US and Japan. JSEP was within the framework of this instruction. It is also the case that KISE principles are to be applied exclusively at the discretion of the commander of US armed forces in the field, without the intervention of host countries. In addition, JSEP was triggered, not by any Japanese initiative but by the provisional deposition of the US Department of Justice to the Yokohama District Court demanding shutdown of the incinerator of an industrial waste treatment company located just beside the residential area of US Atsugi Air Base because its emissions contained high concentrations of dioxin. Against that backdrop, the government of Korea, especially the Department of the Environment, and the Korean people, have pressured the US, insisting it accept responsibility for environmental restoration. It has to be followed by the US and Korean Governments prior to the return of bases. These recommendations are addressed to the Prefectural Government of Okinawa, to local governments in Okinawa hosting US bases, and to the Okinawan people who demand the early return of US bases. Recommendation One That the cleanup responsibility of US military bases to be returned to Okinawa in the future should follow the Korean experience as relevant precedent. Those contents should include, inter alia, entries spelling out the responsible entities, methods, and schedule for soil contamination survey and cleanups, and procedures for evaluation of results. It should also

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include procedures for consultation among related parties and for information disclosure. It is said that Paragraphs 1 and 2 of Article IV are a matched pair that cancel each other out. But be that as it may, the clause applies only to buildings or structures left on facilities and areas, and does not cover soil pollution. Based on the Korean experience, the cleanup of soil contamination to the level required by Japanese legislation cannot be expected through the application of KISE even if the US were to admit responsibility. Usually cleanup work is done using the budget of a field military unit and acceptance of responsibility tends to be avoided because of budget limitations, using KISE as a pretext. In the US, military budgets are being substantially reduced due to financial stringency and there is no prospect for a favorable turn in the near future. Enough lead time has to be guaranteed to prepare the redevelopment plan for the returned site. Because soil contamination of the returned site is not uniform but tends to be spotty, the preparation of development plans based on real information as to soil contamination is crucial for cleanup work to be conducted with lower costs and over a shorter time span. Because the Japanese Government is to assume the cleanup responsibility using monies paid by Japanese tax payers, the minimum responsibility for the US is to cooperate by providing information. For a start, it is necessary to make the Okinawa Defense Bureau disclose information it acquired at the time of the return of US bases in the past. That information should include, inter alia, communication channels with US armed forces for the acquisition of data, the scope of the data acquired and the timing of such acquisition. This is a prerequisite for the implementation of Recommendations One and Two. Although the US armed forces and the Japanese Government as its messenger always claim that the need for military secrecy constitutes a constraint on information disclosure, information about soil contamination should be by no means a military secret. All records and information as to site use should be disclosed in a timely order to facilitate environmental restoration.

Further Outstanding Issues There are two additional issues to be solved for the smooth restoration of returned US military bases. This will facilitate understanding of US cleanup policy in the forthcoming return of bases south of Kadena. This document was presented to study the measures to be adopted in accordance with the Joint Communique between President Nixon and Prime Minister Sato on Okinawan reversion. This document shows the unmistakable US stance of avoiding cost burdens. Second, the issue of extraterritorial application of US environmental laws should be studied in more detail, with special attention paid to *ARC Ecology v. To deal with the hazardous waste left by the U. Navy and Air Force to make a preliminary assessment of the contamination at Clark and Subic.* Consequently, environmentally damaging activities carried out by American actors abroad may go unchecked. Although the extraterritorial application of environmental statutes is, in general, restricted, a small number of environmental statutory provisions contain such express language of extraterritoriality that their extraterritorial application is difficult to deny. These provisions exhibit the kind of explicit language typically required to achieve extraterritorial application. That was the reason why the plaintiffs *Okinawa Dugong* got a favorable judgment in *Okinawa Dugong v.* The judicial presumption against extraterritorial application of domestic laws plays a major role in limiting the scope of U. With the general understanding that congressional legislation is domestically focused, and with the objective of preventing the application of U. In contrast, the presumption has eroded in the realm of securities and antitrust laws and courts have developed alternative tests that more leniently allow for the extraterritorial application of such laws in order to avoid harm to American markets. The inconsistency between how courts apply the presumption in environmental law as compared to in market law signals both an opportunity and a necessity to overcome the presumption in the context of environmental law. The cleanup of polluted sites will become a serious problem for the hosting local governments if the bases south of Kadena are returned to them in the near future. The author will be very happy if this short paper proves useful to the work of that office as well as to the people of Okinawa concerned with base environmental issues. The Japanese original of this paper dated November 8, is for presentation at an International Symposium on Base Environment problems to be held in the Okinawan Prefectural Museum on 7 December Edited by Gavan McCormack Recommended citation: Instead they stick to the position that the restoration of original conditions including environmental restoration is the responsibility of Japanese Government as supplier of the

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bases. Camp Kuwae North was returned in March , but because of the lack of proper records on site use, cleanup works are not yet finished for one-third of the site. LaPorte, before leaving office. The proposal did not include new commitments and did not meet the environmental restoration level required by Korean legislation. He warned that it could be damaging for the alliance if there was no agreement on the basis of the very reasonable US proposal. Although this reply may have been half bluff, the ambassador did not deny US responsibility for environmental restoration. Although there is a decisive difference about the level of environmental restoration required, both sides accepted the Polluter Pays Principle. Its last half reads as follows: The Government of Japan, in accordance with relevant laws and regulations, will take all available measures to respond appropriately to serious contamination caused by sources outside facilities and areas. This part shows clearly why the agreement became necessary. The details of that procedure were established in Appendix A on May 30, According to JEAP, 1 Evaluation of contamination is to be done based on Korean standards and cleanups are also to be done by the Korean side, with cleanup costs to be borne by the US, 2 Survey period to be extended from 60 days Appendix A to days, 3 When the US side carries out cleanups, Korean side can monitor the operation, 4 Consultation will be held at the Environment Subcommittee in the event of problems. It does not apply outside the United States. An ECP Report may be prepared for the entire installation or a single parcel. The ECP Report summarizes the historical, cultural, and environmental conditions at the property and includes references to publicly available and related reports, studies, and permits, as available. The scope of the ECP Report depends upon a number of factors including the current property use, the extent or lack of contamination, the current status of any remedial or corrective actions being taken at the property, and the presence of protected species or cultural assets. United States Department of the Air Force:

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Chapter 2 : Frode Fonnum (born February 3,), Norwegian research scientist | Prabook

Environmental Contamination and Remediation Practices at Former and Present Military Bases outlines the different strategies that are useful in the investigation and subsequent remediation of military bases, Particular attention is paid to the pollution of groundwater.

Navy is working hard to clean up releases of contaminants to the environment, most of which occurred in decades past. Clean up efforts of three Navy installations are raising awareness of the overall successes of this program. As a result of their efforts, on June 1, each installation received a Chief of Naval Operations environmental restoration award for fiscal year . Base activities over the years led to disposal and spills of hazardous chemicals, including petroleum, metals, pesticides, and volatile organic compounds. Unexploded ordnance from World War II munitions storage, handling, and training has also contaminated the former base. As a result, Adak has more than sites, totaling 76, acres of land, identified for investigation and potential action. While successfully executing a large environmental program, the Adak environmental restoration team has made use of green technologies whenever practicable. Such technologies included wind-powered, free-product recovery systems for the reuse of petroleum as an energy source and a mobile water treatment system to treat water from the decommissioning of nine miles of petroleum product pipelines. The pipeline cleaning water was treated and reused, and the petroleum-water mixture recovered from the pipeline system was also treated, significantly reducing the volume of the waste stream. NAS Alameda had active flight operations and performed aircraft maintenance and repair activities, was homeport to two carriers and two cruisers and performed maintenance on these ships and supporting infrastructure, all resulting in the disposal of solid wastes and hazardous materials into on-base landfills. Prior to , industrial wastewater and storm water sewers discharged into surrounding waterways. The installation was identified for closure in September , and operations ceased in April . There are 34 installation restoration IR sites at Alameda Point. The Alameda Point community originally requested that the Navy remove the landfill and its waste off site. However, the Navy was able to demonstrate that restoring the landfill on site would be protective of both human health and the environment. The approach for restoring the landfill included removal of contaminants within the top foot of soil, installing a four-foot waste isolation cover to prevent direct contact with buried waste and provide a foundation for open space reuse, excavation of contamination adjacent to and within the shoreline areas, on-site groundwater treatment to address chlorinated solvents, and institutional controls to protect the integrity of the remedy. Naval Air Station Brunswick NASB was first commissioned in and has housed numerous patrol and reserve aircraft squadrons, as well as supporting ships from various northeastern naval activities. These activities resulted in leaks, spills, and disposal activities that were considered acceptable practice at the time, leaving behind chemicals in the soil, groundwater, and sediment in certain areas of NASB. In total, 26 areas of concern have been identified for investigation. Since being included on the BRAC list in , NASB has accelerated its cleanup program, expediting actions to promote property transfer and civilian redevelopment efforts as the base transitions through closure in May . NASB has used innovative technologies for its cleanup efforts, including low impact development initiatives to recycle more than 28 million gallons of water annually on-site, rather than discharging the treated water to the town sewer system. Rather than demolishing and repairing a portion of the building to remediate the area, the Navy used a cutting-edge technique known as "jet grouting," in which grout is mixed in place with existing contaminated soils to sequester the petroleum without excavation. More than 7, tons of soil from the service station were recycled rather than transported for landfill disposal, allowing for soil reuse and minimal loss of landfill capacity. Beginning in , the Navy initiated a second phase of the Environmental Restoration Program to address sites with munitions and explosives-related contaminants excluding operational ranges. This program, referred to as the Munitions Response Program, has completed initial surveys to identify sites and is performing more detailed site investigations to support decisions for cleanup. Environmental Protection Agency, state, and local regulatory

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agencies. Through public input and its partnerships with regulatory agencies, the Navy is committed to meeting or exceeding these goals. As of the end of fiscal year , the Navy has 3, installation restoration sites, munitions response sites, and 47 compliance cleanup sites at Navy and Marine Corps facilities. The installation restoration sites are on track to have remedies in place RIP or response complete RC by The Navy will continue working toward the goal of a clean, healthy environment that supports the fleet mission, without repeating past practices. The Navy seeks continual improvements to the Installation Restoration Program and the Munitions Response Program, fostering innovative investigation and cleanup decisions through technical workgroups, educational opportunities, and annual conferences that bring restoration staff together to share lessons learned. In addition, working through community-supported Restoration Advisory Boards RABs , the Navy continues to share information with stakeholders about these programs while promoting understanding of total Navy readiness issues.

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Chapter 3 : groundwater remediation site Books and Publications | Environmental XPRT

Environmental Contamination and Remediation Practices at Former and Present Military Bases outlines the different strategies that are useful in the investigation and subsequent remediation of.

US forces shift farther south and consolidate around Pyeongtaek. South Korea intends to convert the site into a series of six parks, but there are unresolved concerns regarding alarming levels of toxic contamination. In the decade after an oil leak became known in 1994, cleanup efforts by the Seoul Metropolitan Government removed nearly 2,000 tons of oil-contaminated underground water from areas outside of Yongsan. Forces Korea USFK claimed that it rectified the problem at its source in 1995, yet the level of petroleum hydrocarbon pollution in nearby groundwater continued to grow, multiplying by a factor of nearly thirteen times over the last four years. It can only be presumed that the situation inside the base is substantially worse. Among the more harmful chemicals found in surrounding groundwater are benzene, toluene, and xylene. High levels of toluene exposure during pregnancy, such as those associated with solvent abuse, may lead to retardation of mental abilities and growth in children. Other health effects of potential concern may include immune, kidney, liver, and reproductive effects. The first order of business is to identify the full extent of contamination. Yet, for more than ten years, USFK repeatedly rejected requests by the South Korean national government and the Seoul city government for permission to conduct an onsite inspection. Forces Korea relented, allowing Korean inspectors to enter Yongsan and test the soil and groundwater. The court ruled in favor of the civic groups, which produced no result, as the Ministry of Environment is expected to lodge an appeal with the Supreme Court. Among other bases that the United States failed to clean up is Camp Casey, the future home of a university, with pollution covering 42 percent of its area. The most recent two conservative administrations have taken an odd stance on the matter, ultimately agreeing each time after long negotiations that the polluter bears no responsibility. There is no agreed upon standard on pollution remediation, and each case is separately negotiated between U.S. and Korea. Over a three-year period ending in 1995, the SOFA Joint Committee surveyed 41 military sites that had been closed down. Investigations were limited to 10 days per location, of which only sixty days were given for onsite inspections. The Korean firms selected to conduct the investigations were not provided with full data on the sites until near the end of the scheduled thirty-day period for assessment of records. When an extension was requested for onsite inspections, the Koreans were firmly rebuffed. KISE remains the standard. Therefore, it cannot be said that any U.S. base is safe. But this is not how carcinogens typically work. It can take years, or even decades, for exposure to toxic substances to produce cancer. Tours of duty for U.S. personnel there would have to be immediate or near-immediate lethality or severe illness among large numbers of personnel before the United States would concede the need to fund cleanup efforts. In meetings with their South Korean counterparts, American environmental subcommittee members argued that no remediation can be done unless the standard of KISE is met, and none of the returned bases qualified. Counter-arguments that contamination levels far exceeded Korean environmental standards fell on deaf ears. Eventually, to placate its Korean partners, the U.S. It was a sop, leaving myriad issues of contamination unaddressed. Korean environmental officials were particularly annoyed at the bioslurping that was performed at pilot sites, as this method had only a peripheral and temporary impact. It has the advantage of having a lower cost than alternative measures, although it fails to treat residual soil contamination. It can be a useful approach, but not where the source continues to pollute. In such cases, areas processed by bioslurping are quickly re-contaminated. Once USFK returned the 23 bases to Korea, the Ministry of Environment conducted a desultory one-month inspection, focusing only on confirming whether or not the U.S. The ministry found that it had not. USFK had failed even to remove the oil in the water that resulted from the bioslurping operation. South Korean officials were not given the opportunity to review and assess cleanup operations while they were taking place, as American officials felt they were only doing the Koreans a favor. But when inspection results indicated that trace amounts of the defoliant found fell well within safety levels, the issue was

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considered closed and mostly forgotten. By limiting attention to the question of whether or not dioxin was still buried in the camp, other important matters went unexplored. These were later dug up and removed, along with 40 to 60 tons of contaminated soil. Green Korea United feels the investigation was handled in a superficial manner, as boring had extended less than ten feet below the surface. Steve House, one of the former servicemen who had been involved in the burial of dioxin, reports that the substance was dumped in a trench and covered by twenty to thirty feet of soil. The investigators failed to dig deeply enough, so if there had been any substantial leakage into the ground from the buried drums, it would not have been discovered. In another curious omission, investigators interviewed none of the former officers in charge of the burial operation. Army, its internal investigation found no trace of Agent Orange. They found what would reasonably be considered a cooled off version. In all, more than one hundred toxic substances were buried on the base in I would be concerned for the people who are drinking water from those wells. Koreans residing near the camp were not so sanguine and questioned why they were witnessing abnormally high rates of cancer. Who in the world lets the accused do the investigation? As so often, U. Opposition assemblywoman Lee Mi-kyung was informed by a government source, however, that a groundwater sample contained petroleum residue at times the legal limit, and several carcinogenic substances were also measured at well above safety standards. Ten years ago, an estimate placed the cost of cleaning the 59 camps to be returned by to the level of Korean standards at more than half a trillion dollars. It may be too much to expect the Park Geun-hye administration to put the needs of its people ahead of U. Yongsan would be a good place to start. His website is <https://>

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Chapter 4 : Military bases' contamination will affect water for generations | Center for Public Integrity

Get this from a library! Environmental contamination and remediation practices at former and present military bases. [Fonnum; North Atlantic Treaty Organization.

Troubled Water Blog Close For decades, day-to-day military operations have contaminated the water at bases across the country, including the now-defunct George Air Force Base in Victorville, Calif. Two decades after the base was closed, buildings remain abandoned. At current and former U. Environmental Protection Agency, meaning they are among the most hazardous areas in the country requiring cleanup. Since , the EPA has been monitoring the base, where more than 60 chemicals were found in soil and groundwater. The sun sets over the former George Air Force Base, where once busy roads are now mostly empty. Originally developed by corporate giants 3M and DuPont for use in consumer products like Teflon, Scotchgard and stain-proof clothing, these chemicals, known as per- and polyfluorinated alkyl substances PFAS , were used by the DOD since the s in firefighting foam to extinguish jet fuel fires. In , the EPA added PFAS to its list of unregulated contaminants that may be hazardous to human health, though records indicate the Pentagon knew of the hazards decades earlier. In , the Air Force Aerospace Medical Research Laboratory conducted studies that found that exposure to earlier variations of PFAS were harmful in female rats and caused behavioral changes in offspring. For example, in May, residents in Airway Heights, Washington, were instructed not to drink their tap water after elevated levels of PFAS were found in drinking water wells on and around the active Fairchild Air Force Base. They ought to be leading the effort to solve this problem. To find people who might have been affected, and to provide whatever relief is appropriate. Part of the base has been converted to a prison, while other parts remain abandoned. Many parts of it are abandoned. The operations building and movie theater are boarded up. Tumbleweeds, mounds of concrete and building materials fill the dugout of an old baseball field. But while almost any sign of military life is gone, the water contamination is not. Jet fuel, benzene, trichloroethylene TCE , pesticides and radioactive wastes have contaminated groundwater, EPA records show. Within one year, the DOD began transferring land over to local communities to be redeveloped. But 25 years later, the water still is contaminated. It tasted like JP-4, jet fuel. Lisa McCrea, a former military wife, learned about the tainted water from his website. She recalled the unsettling memory of pesticides being sprayed on her home, leaving yellow stains on the walls and on their clothes. In July, she made the trip from Ohio to California to revisit the base. She later was diagnosed with breast cancer and gynecological issues. The VA awarded her 70 percent disability, acknowledging that her health conditions could be connected to her military service at the base. Many of the buildings left on the former George Air Force Base are empty, including the hospital, which sits near a water tower. Instead, it proposed using Monitored Natural Attenuation, a remediation strategy that allows nature to break down the chemicals over time. Phil Mook, a senior representative for the Air Force Civil Engineer Center, which is overseeing cleanup at George, said the Air Force has spent the last 30 years removing contamination. Estimated, another 70 years after that, we have the last little tail of it. We want a more aggressive approach than watching it. At the height of the Cold War, the base was home to Bs and nuclear bombs. Now, little is left but empty airfields and crumbling buildings. Wurtsmith was closed in and was proposed as a Superfund site in Leaking storage tanks and waste disposal practices at the base contaminated the groundwater with benzene, trichloroethylene, lead and other hazardous chemicals for decades. PFAS discovered in also polluted groundwater, not only on the base but in surrounding communities. Remnants of the old Wurtsmith Air Force Base offer hints of military life from nearly three decades ago. Now, residents in Oscada, Mich. Just drinking the contaminated water is a problem. He also is part of the Wurtsmith Restoration Advisory Board, which includes EPA representatives, Air Force officials and other residents who are working together on a cleanup plan. I believe that this slow response from the Air Force in treating this contamination is a poisoning of the American people. Thompto worked as a security police officer on the base from to One night, while on a routine security check of the base, he discovered

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leaking barrels of cleaning solvents. I looked and it was all rolling down and going in the drain. While working security police on Wurtsmith Air Force Base, he checked ID badges of personnel in the weapons storage area. In , he was awarded percent disability from the VA. It took Thompto and his wife seven years and several appeals before the VA acknowledged that his brain tumor was related to contaminated water. A recent brain scan shows Thompto could completely lose his brain function at any time. It could happen a few months from now. Today, the air strip is used by a commercial airline and the Air National Guard. Before the base closed in the spring of , the state of New Hampshire had already created a redevelopment plan to replace the former base with a business park. Today, the base is gone, replaced with brick buildings housing restaurants, pharmaceutical companies and day care centers. But in , Amico learned from a newspaper article that water serving the tradeport was highly contaminated and unsafe to drink. Her daughter and husband had been drinking the water every day for three years. Pease was the first military base to discover PFAS in the local drinking water. Three drinking water wells serving the entire tradeport tested positive for PFAS, and one in particular tested at levels more than The women founded Testing for Pease, a community activist group to fight for health testing for the people who had been drinking water on the base, including their children who attended a day care there. She remembered the day she received the results for her two children. However, as of May , the Air Force has denied community requests to conduct a health study on the residents affected by the contamination at Pease. Corinne Roels and Adrienne St. Clair are Reynolds Fellows.

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Chapter 5 : Military basesâ€™™ contamination will affect water for generations - Troubled Water | News21

K.J. Reimer is the author of Environmental Contamination and Remediation Practices at Former and Present Military Bases (avg rating, 0 ratings, 0 rev.

DoD officials say not every base suffering such contamination is on the list, because information was not available for all bases. The IRP report contains no explanation of the problems at each base, so we asked each service to provide details. The Army did so. The Navy Chief of Information refused to help us gather the information. Air Force Public Affairs could not provide the information by our deadline, but we will publish it as soon as it becomes available. Monitoring in indicated contamination of surface and ground water. Four standby wells were shut down in due to detected organic compounds. Deer Creek and Winters Run, unaffected by contamination on base. Hill, VA There are three problems. A herbicide contaminated the soil near an old pesticide storage building. The soil has been placed in sealed drums. Second, herbicide and dioxin Contaminated soil and debris are stored at a base warehouse in gallon drums inside sealed gallon drums. A study will be done to recommend an environmentally sound method of permanent disposal. Third, the base plans to remove some 70 tons of soil contaminated by DDT. The base water comes from a deep aquifer and is not contaminated, the Army says. Fort Belvoir, VA Several contaminants - benzene, trichloroethylene, chloroform, toluene, ethylbenzene, and dichloroethane - have seeped from the Building tank farm into an unnamed creek. None of these contaminants was detected in surface water at the installation boundary, and no health hazard is apparent, the Army, says. Post drinking water comes from the Fairfax County Water Authority. Fort Devens, MA A sanitary landfill that is a potential source of contamination is being closed. It was used as an open burning site, then for incineration of waste and burial of residues. Water quality meets state standards. Fort Dix, NJ Nine potentially contaminated sites are known. One, the sanitary landfill, was placed on the National Priority Superfund List due to the presence of organic solvents. However, the Army says no significant health hazards have been identified. To avoid any risk, the landfill may be capped with clean soil and vegetated with grass. The other eight sites were identified only recently. Investigation is under way to determine any problems. The sites to not endanger the base water supply according to the Army. Fort Lewis, WA There are two problems: One, is Landfill No. Plans call for a landfill liner and leachate collection to preclude ground water contamination. There are also plans for a refuse-fired incinerator to reduce reliance in the landfill. Post drinking water comes from a spring unrelated to that aquifer. Fort McClellan, AL Ten old training areas and three former disposal sites have a slight chance of subsurface contamination from mustard agent and its breakdown products and possible byproducts of chemical agent decontamination. Only very small quantities of agent were used and all sites have been closed, decontaminated and fenced. No evidence of any surface or surface water contamination has been found in the past, the Army says. The post receives its water from the city of Anniston. Manufacturing waste was contaminating soils and streams. DDT was found in the wildlife food chain but not in potable water supplies inside or outside the base. In addition, the presence of PCBs. An investigation is under way to determine if they contaminated the active sanitary landfill, a DDT waste landfill, open burning and detonation grounds, and 22 old disposal sites. Navy A study is under way to determine contaminants and their migration habits. Lakehurst Naval Air Engineering Center, NJ Soil and shallow ground water at the tetraethyl lead disposal site are contaminated, perhaps from aviation fuel. The ground water in some areas is covered with a 6-inch layer of JP-Fuel. Elsewhere, the carcinogen nitronimine may be present. Waste oils, battery acid, and solvents are suspected of having been discharged into some dry wells. The soil stabilization field test received gallons of aniline and of furfural toxic by ingestion, inhalation, or skin absorption , and ferric choride solution; personnel and animals that come in contact with the soil may be endangered. A landfill received thousands of gallons of hydraulic fluids, five tons of asbestos, and also cutting oils, solvents, sludge. The western portion of the base may be contaminated by ordnance: The shallow aquifer in this area may also be contaminated. Waste oil, solvents, fuel, and caustic rinse water containing

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heavy metals have been discharged through the storm sewer system and into Dugella Bay. Subsurface migration at the seaplane base may have affected fish or shellfish in Oak and Crescent Harbors. A backup well at Ault Field is threatened by potential migration of contaminants.

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Chapter 6 : US Military Bases Known To Be Contaminated

The following 59 U.S. military bases were suffering from significant water or soil contamination a year ago, according to the Department of Defense's interpretation of its latest hazardous waste survey.

At current and former U. Environmental Protection Agency, meaning they are among the most hazardous areas in the country requiring cleanup. Since , the EPA has been monitoring the base, where more than 60 chemicals were found in soil and groundwater. In March, the DOD said it would be testing the water at active and closed bases across the country to determine whether perfluorinated compounds are contaminating the drinking water on bases and in communities around them. Originally developed by corporate giants 3M and DuPont for use in consumer products like Teflon, Scotchgard and stain-proof clothing, these chemicals, known as per- and polyfluorinated alkyl substances PFAS , were used by the DOD since the s in firefighting foam to extinguish jet fuel fires. In , the EPA added PFAS to its list of unregulated contaminants that may be hazardous to human health, though records indicate the Pentagon knew of the hazards decades earlier. In , the Air Force Aerospace Medical Research Laboratory conducted studies that found that exposure to earlier variations of PFAS were harmful in female rats and caused behavioral changes in offspring. For example, in May, residents in Airway Heights, Washington, were instructed not to drink their tap water after elevated levels of PFAS were found in drinking water wells on and around the active Fairchild Air Force Base. They ought to be leading the effort to solve this problem. To find people who might have been affected, and to provide whatever relief is appropriate. Part of the base has been converted to a prison, while other parts remain abandoned. Many parts of it are abandoned. The operations building and movie theater are boarded up. Tumbleweeds, mounds of concrete and building materials fill the dugout of an old baseball field. But while almost any sign of military life is gone, the water contamination is not. Jet fuel, benzene, trichloroethylene TCE , pesticides and radioactive wastes have contaminated groundwater, EPA records show. Within one year, the DOD began transferring land over to local communities to be redeveloped. But 25 years later, the water still is contaminated. In , PFAS chemicals also were found by the Air Force in the groundwater at the base, a potential threat to the businesses that have been built on the base, as well as surrounding communities. It tasted like JP-4, jet fuel. Lisa McCrea, a former military wife, learned about the tainted water from his website. She recalled the unsettling memory of pesticides being sprayed on her home, leaving yellow stains on the walls and on their clothes. In July, she made the trip from Ohio to California to revisit the base. She later was diagnosed with breast cancer and gynecological issues. The VA awarded her 70 percent disability, acknowledging that her health conditions could be connected to her military service at the base. Instead, it proposed using Monitored Natural Attenuation, a remediation strategy that allows nature to break down the chemicals over time. Phil Mook, a senior representative for the Air Force Civil Engineer Center, which is overseeing cleanup at George, said the Air Force has spent the last 30 years removing contamination. Estimated, another 70 years after that, we have the last little tail of it. We want a more aggressive approach than watching it. Now, residents in Oscada, Mich. At the height of the Cold War, the base was home to Bs and nuclear bombs. Wurtsmith was closed in and was proposed as a Superfund site in Leaking storage tanks and waste disposal practices at the base contaminated the groundwater with benzene, trichloroethylene, lead and other hazardous chemicals for decades. PFAS discovered in also polluted groundwater, not only on the base but in surrounding communities. Just drinking the contaminated water is a problem. He also is part of the Wurtsmith Restoration Advisory Board, which includes EPA representatives, Air Force officials and other residents who are working together on a cleanup plan. I believe that this slow response from the Air Force in treating this contamination is a poisoning of the American people. Thompto worked as a security police officer on the base from to One night, while on a routine security check of the base, he discovered leaking barrels of cleaning solvents. I looked and it was all rolling down and going in the drain. In , he was awarded percent disability from the VA. It took Thompto and his wife seven years and several appeals before the VA

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acknowledged that his brain tumor was related to contaminated water. A recent brain scan shows Thompto could completely lose his brain function at any time. It could happen a few months from now. The women founded Testing for Pease, a community activist group to fight for health testing for the people who had been drinking water on the base, including their children who attended a day care there. Before the base closed in the spring of , the state of New Hampshire had already created a redevelopment plan to replace the former base with a business park. Today, the base is gone, replaced with brick buildings housing restaurants, pharmaceutical companies and day care centers. But in , Amico learned from a newspaper article that water serving the tradeport was highly contaminated and unsafe to drink. Her daughter and husband had been drinking the water every day for three years. Pease was the first military base to discover PFAS in the local drinking water. Three drinking water wells serving the entire tradeport tested positive for PFAS, and one in particular tested at levels more than Amico and two other mothers created an advocacy group after learning that their children had been drinking contaminated water at a daycare on the tradeport. She remembered the day she received the results for her two children. However, as of May , the Air Force has denied community requests to conduct a health study on the residents affected by the contamination at Pease.

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At current and former U.S. military bases, the contamination is so severe that they have been designated Superfund sites by the U.S. Environmental Protection Agency, meaning they are among the most hazardous areas in the country requiring cleanup.

Chapter 8 : Navy's Environmental Restoration Program Promotes a Cleaner Future

reuse of contaminated properties on closed military installations, discusses the status of cleanup to prepare these properties for reuse, examines estimates of costs to address remaining cleanup challenges, and identifies issues for Congress.