



Commander Fleet Activities Chinhae

2023 Secretary of the Navy Environmental Award
Environmental Quality – Overseas Installation Narratives



Cherry blossoms identify the serene, peaceful Korean culture and show off the country's beautiful landscape.

Introduction

Commander Fleet Activities, Chinhae (CFAC) is the only U.S. naval base in continental Asia, located near the southern tip of South Korea, approximately 30 miles west of Busan, the country's second largest city. CFAC provides operational support and service to the fleet through joint and combined armistices, exercises, and contingency operations, and it strengthens the U.S. and Republic of Korea (ROK) alliance. In addition to being the only U.S. Navy base, Chinhae is home to the ROK Naval Academy and the country's largest navy base. CFAC serves 442 military and civilian personnel working or living on base. CFAC offers sailors unique small-town comfort not found in Korea's larger cities. Spacious base housing and the close-knit community make Chinhae the Navy's "best kept secret."

Background

CFAC occupies 90 acres of steep foothills. One third of the base is forested, the only natural environment that provides habitat for numerous species of birds and wildlife. Despite the inherent environmental and cost challenges, innovative



Fleet Activities Chinhae is located in the south of the Republic of Korea.



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engineering solutions create more vertical development that favors conservation. The Environmental Management Division (EMD) consists of one U.S. civilian and three Korean nationals with proven experiences and skills in managing environmental programs to ensure CFAC’s activities in the Korea Region comply with the standards regulated by the Korea Environmental Governing Standards (KEGS), the U.S. Department of Defense (DOD) and U.S. Navy, and the U.S. Environmental Protection Agency (EPA). EMD personnel not only work jointly with Navy units across the region, but also coordinate with the host nation’s agencies and communities to implement environmental quality programs to ensure cost effectiveness and stakeholders’ involvement.

Summary of Accomplishments

Drinking Water and Partnerships

CFAC manages two drinking-water systems (WS) at Busan and Chinhae that must comply with the stringent requirements of KEGS. These systems especially must meet the U.S. Navy standards that require overseas WS to meet or exceed the U.S. National Primary Drinking Water Standards to ensure the quality of drinking water.

Elimination of Per- and Polyfluoroalkyl Substances (PFAS) from Chinhae’s Supply Water: Using dual two-stage (rapid sand filter and granular activated carbon (GAC) filter) filtration units, CFAC successfully reduced PFAS from an average of 9.2 parts per trillion (ppt) in supply water to zero or a Not Detected (ND) level in finished water in May 2021. After the successful PFAS elimination, EMD initiated a Total Organic Carbon (TOC) and PFAS removal efficiency study to fine-tune the filtering system, as the current system does not warn if the GACs are about to break through or are saturated enough to release FPAS into the treated water. Above all, CFAC strives to meet the EPA’s

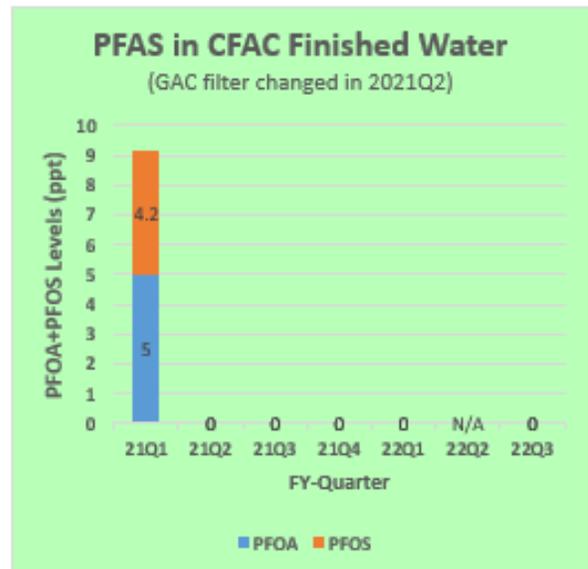
newly-proposed Maximum Contaminant Level Goal (MCLG) of zero ppt and MCL of 4.0 ppt.

Due to a relatively thin top soil (less than 5 meters) with limited filtration effect, EMD has started a water quality improvement study (WQIS) that identifies the potential PFAS and chemical concern sources, develops effective measures to protect the wellheads and the acquirer, and provides a PFAS-free groundwater well as a permanent solution.

Certificate to Operate (CTO) Water System:

EMD worked jointly with branches across the Department of Public Works and externally with the Navy regional and headquarters offices to resolve all significant deficiencies from the 2019 Sanitary Survey and achieve the full CTO for Busan WS. Throughout this process, EMD has developed a strong working relationship and mutual trust with the Busan Water Authority, resulting in information on contaminants, PFAS treatment, and system operations being shared to ensure the delivery of the water quality at Busan WS under optimal conditions.

Water Team Technical Competency: The team consists of experienced water system operators and a drinking water program manager with a





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Ph.D. in soil science, and is supported by the environmental director, who has professional engineering expertise in drinking water. PW branches and EMD have been working diligently to resolve the only significant deficiency remaining – Inadequate Backflow Prevention (BFP) program, a significant challenge as over three hundred BFP devices need to be corrected. With pumping expertise from the Navy Construction Battalion (CB), or “Seabees,” the installation and adjustment of identified BFP devices are approaching completion. In FY21 and FY22, EMD corrected 18 cited deficiencies from the FY19 sanitary survey, including five rated significant, four rated moderate, and nine rated minor.



A potential PFAS-free well is drilled.

To resolve one of the two most challenging significant deficiencies (SD), it required technical knowledge and skills to perform a complicated 4-log virus inactivation calculation and analysis approved by the professional engineers from the PW Utilities Branch. Resolution of the other significant deficiency required a lead-and-copper survey for housing units and a sampling plan.

EMD worked with PW Utilities Manager to collect the necessary data, produce a family housing material survey, and develop a sampling plan. Outsourcing the survey would have been difficult because of the host-nation’s COVID-19 restrictions. If the internal team had not accomplished the task, it would have significantly delayed quality-of-life improvement initiatives. Instead, the substantial internal effort saved the U.S. Navy approximately \$80,000.

Cultural and Natural Resources (CNR) Conservation

CFAC’s natural and cultural resources are plentiful, including 14 archaeological sites and 39 cultural properties. To preserve these precious resources, CFAC updated both the Integrated Natural Resources Management Plan (INRMP) and the Integrated Cultural Resources Management Plan (ICRMP) with new standard operating procedures (SOP) and BMPs in FY21 and FY22, respectively. The INRMP and recent seasonal survey results of the field flora and fauna surveys successfully document habitats and indigenous creatures for forest management. The survey team has identified the northern-forested area as a preferred habitat for birds and small mammals like Korean squirrels and Asian chipmunk species. The area will be managed to ensure a healthy variety of native tree species suitable for wildlife preservation.

Other than flourishing wildlife habitats, new educational signboards were installed in FY22 to replace weatherized ones along the hiking trail throughout the forest area to engage CFAC



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residents and visitors in preserving the natural environment.



Educational signboards are posted along the walking and hiking trails onboard CFAC.

The pandemic restrictions during FY21 prevented Korean cultural-resource experts from traveling to Chinhae to validate and translate the local cultural resources survey (CRS) into English. The CFAC Cultural and Natural Resources Manager voluntarily assessed and translated the CRS into English to be incorporated as part of the ICRMP update. The in-house translation resulted in a saving of \$50,000. The CRS translation also showed EMD's dedication to sustaining the cultural resources program under unusual constraints. Throughout the base, Seibert stakes are maintained to mark the boundaries of all cultural areas. Rope fences are installed to protect historical and archeological sites from being damaged, as suggested by the Korea Cultural Heritage Administration and local experts. The signboards describe the archaeological and cultural properties and their significance. This initiative engages the local population in preserving the area by identifying the unique nature of its environmental habitat. Building a good working relationship with the Assistant Chief of Staff Engineer (FKEN) and the Cultural Heritage Administration has helped CFAC collect and expeditiously obtain the necessary

information for site approval on the proposed water treatment plant construction from the Cultural Properties Protection Subcommittee.



Archaeological Site 11, featured an earthen burial mound and rock in the Joseon Dynasty era, is preserved near the proposed construction site.

Effective Environmental Project Requirement Management (EPRM)

At the beginning of each fiscal year, each media program manager (PM) helps other PMs and shares their expertise in EPRM for the current and the next two fiscal years. Besides preparing a detailed and accurate scope of work (SOW) and a government estimate (GE) for each project requirement, the PM identifies appropriate contracting agencies and vehicles, their capacities, and funding document acceptance lead times. In the last quarter of FY21, the PMs have successfully executed seven previously unfunded project requirements, all within scope and budget, for a total of \$1.1 million: an air emission inventory, Initial Asbestos Surveys (IAS), water quality improvement study on well water containing PFAS, and management plan updates for pesticides, solid wastes, ozone depleting substances, and radon. These projects will help EMD use the most updated measures and regulatory standards to manage five media



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programs; identify potential asbestos presences; and eliminate PFAS sources in the drinking water. In addition, the IAS saved \$15,290 in project management and overhead fees. The other six projects avoided a 2-percent annual inflation cost or \$19,500 for delayed execution. EMD staff was awarded the FY22 Third Quarter Professional Team by the Commander of Naval Facility Engineering Command, Region East, for high proficiency and commitment to environmental quality.

Toxic Substances (Radon, Asbestos, Lead and PCB) Management

EMD has established a proactive program to protect tenants from excessive radon exposure by monitoring indoor radon levels in all facilities occupied for more than four hours. When the indoor radon levels are equal to or greater than the EPA action level (AL) of 4 pCi/L, control and mitigation actions are immediately taken.

During a pandemic-challenged FY21, EMD and the Public Works (PW) production team retested all occupied buildings onboard CFAC before the five-year due date. The retest, completed in November 2021, discovered only one building

with an indoor radon level of 4.5 pCi/L, exceeding the AL. In August 2022, installation of a radon reduction system reduced that radon level to 1.7 pCi/L. As a result of the proactive action, CFAC has met and exceeded standards, accomplished mission requirements, and provided cost savings of approximately \$65,000, which would have been expended by using outside contractors.

Currently, the engineering and maintenance staff are using a comprehensive Asbestos Containing Materials (ACM) database to identify and protect tenants and workers from potential airborne asbestos exposure in case any of their projects disturb ACM. This database contains all previously-identified ACM, including the most current survey conducted in FY22 of 45 buildings. The database also includes Toxic Substances (asbestos, lead, and PCB) Free (TSF) Construction Certification for construction and repairs completed after May 2021. The TSF ensures no ACM is installed, so that future ACM surveys will not be needed for repairs and construction, resulting in a total cost saving of \$37,500 annually.

Additionally, EMD has established and maintained a Lead Based Paint (LBP) database that contains almost 20 years of survey data to allow designers and maintenance personnel to determine the presence of LBP and whether additional LBP testing is required for a project. The Lead Program Manager conducts lead assessments for projects that may disturb LBP or lead containing materials. Internal LBP assessments save approximately \$12,000 annually and shorten project design time, thus increasing efficiency.

Solid Waste and Recycling

The installation-recycling program continually and proactively reduces waste materials that otherwise would be landfilled. Glass/plastic



Radon Reduction System installed in Storage Room, Building 214



Radon Reduction System Outside Building 214



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containers, steel/aluminum cans, cardboard boxes, and mixed paper are collected from housing and industrial areas and recycled to meet city requirements. Approximately 100 tons of recyclables and food waste were diverted from landfills for recycling in FY21. To support the city's food waste diversion initiative, food waste at the installation is collected separately from housing and eating establishments and recycled through approved recyclers.

Hazardous Waste/Hazardous Material (HW/HM) Management

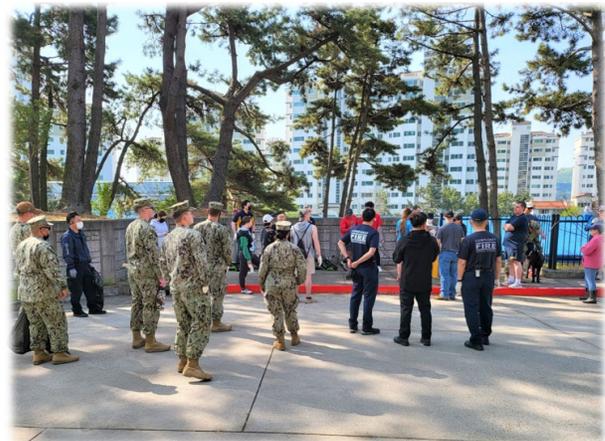
CFAC especially reduces the quantity of, or reuses, Hazardous Material (HM) and strives to replace HM with environmentally-friendly products while considering cost-effective measures. Each HM is screened by a competent environmental professional before it is approved for use in any shop or industrial area. As a result of implementing HM inventory management, strict adherence to Authorized User List (AUL) protocols, product substitution, and base-wide inspections, the HW generations have decreased by 38 percent in FY18, 7 percent in FY19, 50 percent in FY20, and 54 percent in FY21 based on the FY14 baseline. 3,000 pounds of lead acid batteries and POL products have been actively recycled via Defense Logistics Agency contractors in 2021. .

Environmental Management System (EMS) Education and Outreach

CFAC requires all personnel, including contractors working on base, to take EMS training on the Environmental Compliance Assessment Training and Tracking System to help achieve the U.S. Navy's environmental goals and objectives. Personnel assigned to operations that may have a negative environmental impact undergo the required additional training.

On April 22, 2022, CFAC celebrated Earth Day with three events: base-wide cleanup, e-waste

recycling, and bike-to-work weeks. Over forty military and civilians, or nearly 10 percent of the base population, participated in the base cleanup to demonstrate their commitment to protecting the environment. The event has become the base's tradition to remove litter from parking lots and hiking trails. Some participants have taken their environmental efforts further by biking to work to reduce greenhouse gases and their carbon footprints and enhance the local environment and community quality of life.



The installation commanding officer conducts a safety brief before the Earth Day cleanup.

Conclusion

CFAC staff and leadership consistently and actively find creative and cost-effective solutions to maintain and improve environmental sustainability and preservation. The pandemic and its many challenges proved to be the ultimate test of CFAC's perseverance and creativity to preserve and conserve the environment. By relying on in-house talent to improve effectiveness while meeting mission goals and engaging a wide range of stakeholders through a cohesive communication effort, CFAC's environmental program is without a doubt a model of implementing sensible and executable actions even during the most difficult and challenging times. CFAC is fully committed to being the leader by example in the DOD and U.S. Navy's environmental preservation efforts among small overseas installations.