



***Palm Tree Golf Course***  
**Environmental Baseline Assessment**  
**Andersen AFB, Guam      Jun 05**



# Executive Summary

## U. S. Air Force GEM Program

The U. S. Air Force Golf Course Environmental Management (GEM) program is a proactive Air Force Center for Environmental Excellence (AFCEE) initiative to foster a better understanding of the environmental challenges facing our golf courses worldwide. Armed with the support and approval of the Air Force Services Agency golf program, AFCEE's goal is to facilitate the creation of an environmentally friendly golf course facility while supporting the installation mission. AFI 32-7064 requires a GEM Plan as part of the Integrated Natural Resources Management Plan (INRMP).

The primary tenets of the GEM Program are to minimize or eliminate potential negative environmental impacts, attain and maintain daily compliance with all appropriate regulations, and constantly examine all aspects of golf course management to achieve the highest standards of environmental excellence.

## GEM Program process

There are five steps in the GEM program process.

- Analysis
- Documentation
- Implementation
- Evaluation
- Revision



## Environmental Compatibility Quotient

Actual ECQ	78
Potential ECQ	90

## Potential environmental challenges

The following environmental challenges were identified during the GCEBA process:

- New mission beddown initiative
- Water resource management
- Threatened & endangered species
- Greens renovation & irrigation projects
- Invasive exotics

## Where do we go from here?

After confirming the environmental challenges (EC), the golf course staff should compile their preferred management approach to each in the context of their long-term goal of providing the best golfing experience for their customers. These management approaches must then be coordinated with installation environmental managers. Finally, the combined environmental and golf staff team should proceed toward finalizing the GEM Plan. The entire process is summarized on the AFCEE GEM program website (<http://www.afcee.brooks.af.mil/ec/golf/>).

# Analysis

## Course details

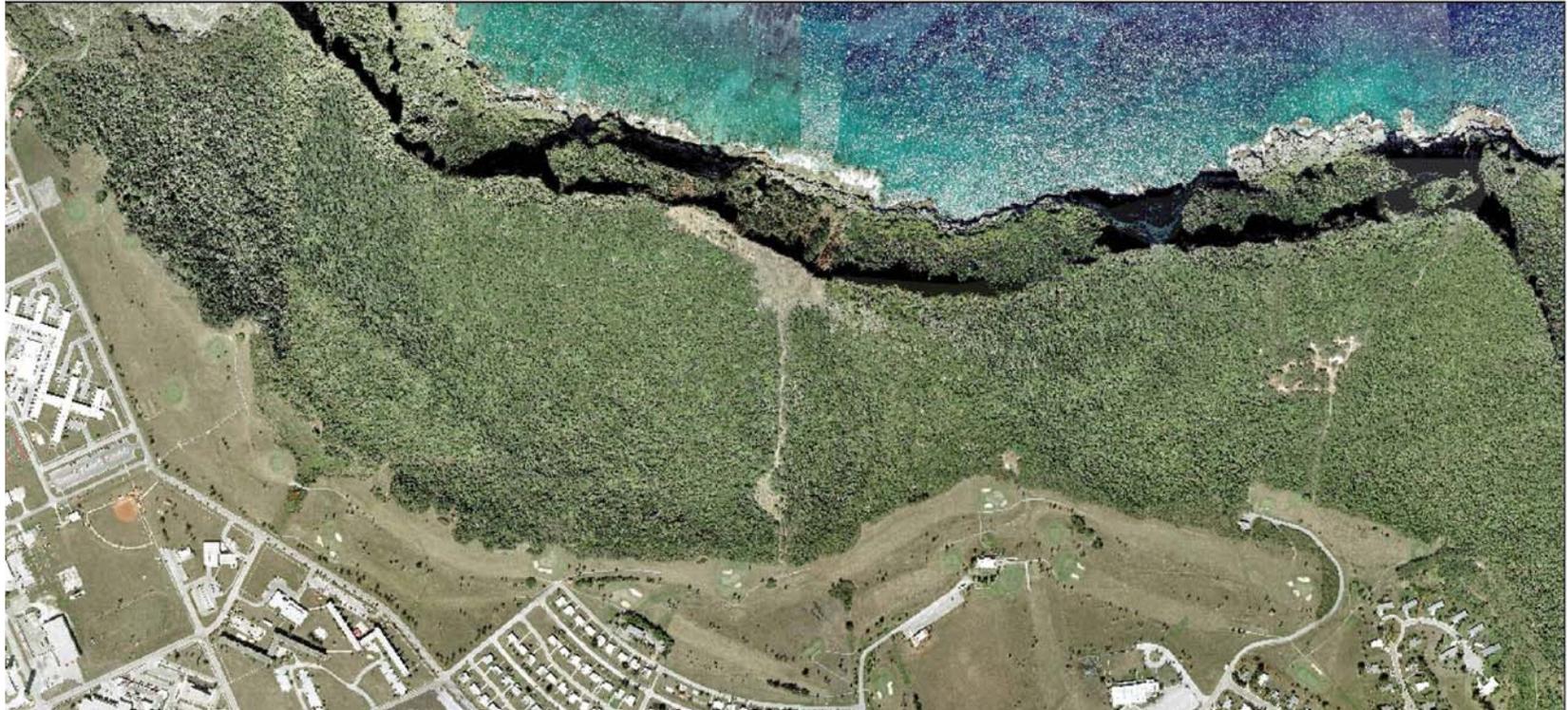
Architect	Gene Holbrook
Year constructed	1966/1988
Climate	Humid tropical
Average annual rainfall	120 inches
Average growing season	Year round
Elevation	Approx. 200' ASL
Winds/Prevailing Direction	North
Total Facility Acreage	Approx. 250 acres
Par	18 Holes- 35-37-72
Yardage/Rating/Slope	Blue- 6432/71.4/132 White- 6067/69.7/130 Red- 4936/70.6/114
Turfgrass	Native & Bermuda mix
Tees-	Crab, Bermuda, Zoysia
Fairways-	328 Bermudagrass
Greens	Broad leaf/crabgrass mix
Roughs-	

## Course description

Until recently, golf in Guam was a scarce commodity. Today the 209-square mile island is home to at least a dozen courses. Competition is tough for the long-time U.S. Air Force golf course manager and his superintendent. Providing good turf conditions on thin or nonexistent soils with limited resources would be a challenge for anyone. Andersen AFB's Palm Tree course is unique in that it is strung out in two narrow loops perched upon the edge of an important and nearly extinct island habitat on the island's northwestern shore. The course's limited soil allows

few plants to thrive. Palm Tree lacks water features for interest or challenge further testing course management's ability to successfully market the course. All in all, Palm Tree has improved dramatically since the arrival of the new management staff. The course is scheduled to receive new greens and a irrigation system which will do wonders for the future of the course and its customers.





**Palm Tree Golf Course Aerial Photo**

## Determining the Baseline (ECQ)

The following is a brief compilation of some of the responses in each of the ten Environmental Compatibility Quotient (ECQ) categories obtained in an interview with the superintendent and the manager conducted during the site visit.

### ECQ Categories

- Overall Management Philosophy & Documentation
- Safety, Training, And Awareness
- Compliance
- Pesticide Use, Storage, & Handling
- Pollution Prevention
- Conservation Practices
- Water Resources
- Maintenance Practices
- Customer Relations & Education
- Miscellaneous Special Projects & Activities

### Key to checklist responses

- **Yes** = Practice is complete or ongoing and can be verified.
- **Partial** = Practice has been initiated but needs further attention and improvement.
- **No** = Practice is not in place.

## ECQ Checklists

The Environmental Compatibility Quotient (ECQ) checklists are a convenient method of assessing the overall performance, implementation, and completeness of an installation's Golf Course Environmental Management Plan. The checklists can be used in many ways including:

- As an analytical tool while compiling a Golf Course Environmental Baseline Assessment like this one.
- As a self-assessment tool for the golf course manager or superintendent.
- As an award nomination evaluation by a Golf Course Assessment Team (GCAT).



*Tropical island golf requires that there be palm trees at every turn.*

## Interpreting the ECQ

The ECQ compiled for an installation's course is a snapshot of the overall performance and compliance with the GEM Plan. There are two measures obtained as a result of using the ECQ checklists to determine the status or quality of the environmental management program: 1) determining the actual and; 2) potential environmental compatibility quotients.

- **Actual ECQ-** the total percentage of "Yes" responses for all ten checklists. This number represents the current level of the golf course management practice compatibility with the environment
- **Potential ECQ-** the total percentage of "Yes" responses plus the total percentage of "Partial" responses for all ten checklists. Maybe the most significant measure; the potential ECQ represents a level of compatibility that could be reached by finalizing or fully implementing a particular practice or procedure.

## ECQ Scoring Scale

Percent Responses Yes or Partial per Category	Level
93-100%	Advanced
83-92%	Getting there
73-82%	Showing progress
63-72%	Early stages
Less than 62%	Just started



*The North Pacific Ocean provides the backdrop for the 18<sup>th</sup> green.*



*Palm Tree's pro shop is outfitted with all the necessities.*

<b>Overall Management Philosophy &amp; Documentation</b>				
<b>#</b>	<b>Environmental Compatibility Indicator</b>	<b>Yes</b>	<b>Partial</b>	<b>No</b>
1	Has management demonstrated that the environment is an important part of their responsibilities by initiating the GEM Planning process?	✓		
2	Has the golf course adopted and posted an Environmental Policy?		✓	
3	Is the GEM Plan underway or completed, available, and updated regularly?		✓	
4	Is a map of the property highlighting identified environmental challenges such as landfills, threatened or endangered species habitat, restoration sites, floodplains, etc. used in the environmental management decision-making process and is it posted for customers?			✓
5	Environmental goals, objectives, challenges, projects, and progress are evaluated at least annually and are regularly communicated to employees, customers, management, and the local community?			✓
6	Are written records of water quality monitoring activities, results, and control measures readily available?	✓		
7	Is there an inventory of bird and mammal species documented, maintained, and readily available?		✓	
8	Is there a general understanding of how course management practices may positively enhance or adversely impact the environment?	✓		
9	Are the environmental impacts of pest control measures such as leaching and runoff potential, toxicity to non-target organisms, soil absorption capacity, pesticide persistence, water solubility, and effects on soil microorganisms and non-target species considered as part of the course management planning process?	✓		
10	Are records of pest treatments employed and their effectiveness maintained and used to guide future pest control decisions?	✓		
	<b>Point totals for each column</b>	<b>5</b>	<b>3</b>	<b>2</b>

<b>Safety, Training, &amp; Awareness</b>				
<b>#</b>	<b>Environmental Compatibility Indicator</b>	<b>Yes</b>	<b>Partial</b>	<b>No</b>
1	All employees are familiar with the GEM program and are trained on the importance of environmental compliance with the goals and objectives of the program as it applies to their duties?		✓	
2	All appropriate employees are trained to be familiar with U. S. Air Force, federal, state, and OSHA regulations that apply to storage, handling, and disposal of chemicals used on the property?	✓		
3	All employees are aware that chemical use, storage, and disposal and their potential risks to human health and the environment?	✓		
4	All employees are trained to understand that poor management practices may adversely impact worker health, on- and off-site water quality, local soil health, and wildlife species and their habitats?	✓		
5	A current copy of all Material Safety Data Sheets (MSDS) for all chemicals used anywhere on the golf course property is maintained and readily available for use by employees?	✓		
6	All employees receive documented, regular training on all potential OSHA issues associated with their duties?	✓		
7	Are all golf course pesticide applicators active participants in a local respiratory and pulmonary testing program?	✓		
8	Are pesticides, fertilizers, and other chemicals stored on appropriate shelving in an approved storage facility?	✓		
9	Are golfers notified in the pro shop and on the first and tenth tees about the day's planned or recently completed spraying of any chemical or fertilizer that may be hazardous to human health or public safety?		✓	
10	Are key staff members trained regarding water quality and conservation issues pertinent to the course and their particular duties?	✓		
	<b>Point totals for each column</b>	<b>8</b>	<b>2</b>	<b>0</b>

<b>Compliance</b>				
<b>#</b>	<b>Environmental Compatibility Indicator</b>	<b>Yes</b>	<b>Partial</b>	<b>No</b>
1	Are fuel storage/delivery area and equipment managed in accordance with federal, state, and local regulations?	✓		
2	Are installation environmental staff members included in pertinent, on-going course management discussions and plans at scheduled meetings?	✓		
3	Are there golf course staff meetings where environmental management issues are regularly discussed?		✓	
4	Does the director of golf and the superintendent attend ESOHCAMP in-briefings and out-briefings?	✓		
5	Does the director of golf and/or the superintendent coordinate with installation environmental staff on the various management plans that affect or include the golf course?	✓		
6	Have all necessary permits been secured and/or updated and their requirements satisfied in a timely manner?	✓		
7	Has appropriate impact analysis (NEPA) been performed on all proposed actions on or affecting the golf course property?	✓		
8	Are containers used to store used oil in good condition, not leaking, and clearly labeled?	✓		
9	Has the golf course staff submitted their proposed management approach to the identified environmental challenges to the installation environmental staff for coordination and review?			✓
10	Were there less than two major golf course facility-related findings during the last official ESOHCAMP visit?	✓		
<b>Point totals for each column</b>		<b>8</b>	<b>1</b>	<b>1</b>

<b>Pesticide Use, Storage, &amp; Handling</b>				
<b>#</b>	<b>Environmental Compatibility Indicator</b>	<b>Yes</b>	<b>Partial</b>	<b>No</b>
1	Are there trained scouts on staff other than the superintendent to monitor turf and plant health and pest populations regularly using a process to notify management of pest problems and organized into a report or guide so that they can be used for future pest control solutions?	✓		
2	Are there written pest profiles of common pest species with a variety of potential control measures pre-evaluated including alterations in cultural management, biological, physical, and mechanical controls prior to treating the problem on the course?	✓		
3	Are there established and documented aesthetic and functional thresholds for all managed areas to effectively manage pest populations and reduce chemical use?	✓		
4	Is there a specially designed pesticide mixing area where all mixing is performed by appropriately trained personnel?	✓		
5	Has a current list of pesticides and other chemicals stored or used at the golf facility been provided to the appropriate Fire Department(s)?	✓		
6	Is there a written Integrated Pest Management Plan readily available and updated in use at the facility?	✓		
7	If personal protective equipment is required for pesticide use, storage, or handling, is it available for use by trained individuals?	✓		
8	Are written and readily available records maintained of all applications of pesticides made by certified applicators, including the following? <ul style="list-style-type: none"> <li>- the quantity of each pesticide used</li> <li>- the chemical or common name of the active pesticide ingredient(s)</li> <li>- the pest or purpose for which the pesticide was applied</li> <li>--the date and place of application.</li> </ul>	✓		
9	Is the chemical storage structure/area locked, well ventilated, fire proof, and is access limited to select personnel?	✓		
10	Are there designated and documented "no spray" areas around pond, river, stream, or lake edges and have they been communicated to pesticide applicators?	✓		
<b>Point totals for each column</b>		<b>10</b>	<b>0</b>	<b>0</b>

<b>Pollution Prevention</b>				
<b>#</b>	<b>Environmental Compatibility Indicator</b>	<b>Yes</b>	<b>Partial</b>	<b>No</b>
1	Are there designated and documented "minimally-maintained" or natural vegetative buffer areas around pond, river, stream, or lake edges and have they been communicated to mower operators and pesticide applicators?	✓		
2	Has the Installation Spill Plan been amended to include the golf course facility and is there a spill containment kit at each required location and are there spill containment procedures in place?	✓		
3	Does the chemical storage area have a sealed metal or concrete floor and are all liquid pesticides handled over an impermeable surface?	✓		
4	Does the chemical storage area have a lip along the edges to contain spills?	✓		
5	Are liquid products stored below dry products and are dry materials stored on pallets or shelves to keep them off the floor?	✓		
6	Have all the golf facility employees regularly received documented and approved HAZCOM and safety and health training?	✓		
7	Are grass clippings blown off equipment with compressed air instead of or prior to washing?			✓
8	Are gasoline, motor oil, brake and transmission fluid, solvents, and other chemicals used to operate or maintain equipment and vehicles prevented from directly or indirectly entering water bodies?	✓		
9	Has the watershed in which the course resides and contributes runoff to been identified and mapped to aid the golf course staff in the management of their facility?		✓	
10	Are appropriate quantities of fertilizers applied during weather conducive to reducing the potential for leaching and runoff?	✓		
	<b>Point totals for each column</b>	<b>8</b>	<b>1</b>	<b>1</b>

<b>Conservation Practices</b>				
<b>#</b>	<b>Environmental Compatibility Indicator</b>	<b>Yes</b>	<b>Partial</b>	<b>No</b>
1	Are recycling containers conveniently provided for customer and employee use throughout the golf course facility?	✓		
2	Are there officially and appropriately designated minimally maintained areas on the golf course facility grounds?	✓		
3	Has the irrigation system or its components recently been upgraded to reduce inefficiency, malfunction, and overall water use?	✓		
4	Has all "non-target" irrigation (ponds, natural, or out of play areas, etc.) been eliminated or minimized?	✓		
5	Have flow meters been installed to monitor water use and detect potential waste?	✓		
6	Has the entire golf course facility property been examined for critical habitats, threatened or endangered species, wetlands, floodplains, and historical/cultural resources?	✓		
7	Are employees encouraged to minimize their trips around the course to conserve on the use of fossil fuels?	✓		
8	Does the snack bar utilize reusable plates and silverware for use by customers throughout the facility's operating hours?		✓	
9	Have all potential maintenance practices for designated "minimally-maintained" or natural areas been coordinated with the installation Bird/Wildlife Aircraft Strike Hazard (BASH) officer and environmental management personnel?	✓		
10	Are all motorized golf course equipment checked regularly for excessive air polluting emissions?	✓		
<b>Point totals for each column</b>		<b>9</b>	<b>1</b>	<b>0</b>

<b>Water Resources</b>				
<b>#</b>	<b>Environmental Compatibility Indicator</b>	<b>Yes</b>	<b>Partial</b>	<b>No</b>
1	Are water features regularly monitored for algae, erosion, excessive aquatic plant growth, fish kills, and sedimentation?	✓		
2	Are wash and wastewater kept from making direct contact with surface water and are they recycled or allowed to filter through a vegetative area when cleaning and maintaining equipment?	✓		
3	Outdoor irrigation of non-golf course landscape areas are regularly monitored and maintained for leaks and efficient performance?	✓		
4	Has the golf course staff coordinated with stormwater management planning requirements from the installation's environmental staff?			✓
5	Have part circle irrigation heads been installed where possible to preserve water resources and reduce maintenance while minimizing potential negative impacts to surrounding minimally maintained areas?	✓		
6	Are all water feature maintenance tasks coordinated with the installation natural resource manager and bird/wildlife aircraft strike hazard (BASH) officer?	✓		
7	Has the irrigation system been completely checked for proper water distribution in all irrigated areas and are water leaks fixed in a timely manner?	✓		
8	Are moving water bodies such as streams or creeks that pass through the golf course regularly monitored for water quality both upstream and downstream of the course?	✓		
9	Does the facility have a Drought Management Plan written, ready, and available if, or when, irrigation restrictions may be instituted and required by the community or the installation?	✓		
10	Are water quality problems immediately reported to supervisors and appropriate installation environmental staff members for instruction and direction?	✓		
	<b>Point totals for each column</b>	<b>9</b>	<b>0</b>	<b>1</b>

<b>Maintenance Practices</b>				
<b>#</b>	<b>Environmental Compatibility Indicator</b>	<b>Yes</b>	<b>Partial</b>	<b>No</b>
1	Is there a written, regularly updated, and readily available Golf Course Maintenance Plan?	✓		
2	Does the Maintenance Plan include individual plans such as Integrated Pest Management, Tree Management, Hazard Communication, Drought Management, Water Feature Management, and a Site-Specific Spill Prevention Response Plan?		✓	
3	Are green, tee, and fairway mowing heights maintained at reasonable levels without continually stressing turf or maximizing chemical inputs?	✓		
4	Are there regular and documented procedures in place to continually improve soil health such as topdressing, organic amendments, aeration, and drainage?	✓		
5	Is there a regularly-updated and readily-available map of the course's "hot spots" requiring special care or regular attention?			✓
6	Is all maintenance equipment maintained and cleaned in a manner that eliminates the potential for spreading of pest or disease contamination?	✓		
7	Has there been a complete examination for potential negative environmental impacts of all aspects of the golf course facility operation including the snack bar and grill, clubhouse, pro shop, and maintenance complex?	✓		
8	Is contour mowing used to conserve fuel and increase playability and aesthetics?	✓		
9	Have all playing surfaces been inventoried and mapped for soil types including soil structure, nutrient levels, organic content, compaction, and water infiltration?		✓	
10	Are soil tests and plant tissue analysis used to determine nutritional requirements?	✓		
	<b>Point totals for each column</b>	<b>7</b>	<b>2</b>	<b>1</b>

<b>Customer Relations &amp; Education</b>				
<b>#</b>	<b>Environmental Compatibility Indicator</b>	<b>Yes</b>	<b>Partial</b>	<b>No</b>
1	Are the course manager and superintendent involved in a regularly updated, documented, and on-going customer educational program?	✓		
2	Is there a conveniently located and highly visible place at the course or clubhouse where golf course environmental management notices and informational messages are regularly posted for customers?		✓	
3	Do the course manager and superintendent actively communicate with customers to determine and document their points of view?	✓		
4	Is there active and regular communication with the golf management staff, civil engineering, environmental management, the Services manager, and commanders by course management?	✓		
5	Does the golf staff regularly survey their customers on how they rate the various elements of the golf course facility?	✓		
6	Is there consistent and attractive signage around the course and grounds that would increase the awareness of the average golfer to the environmental management practices employed?		✓	
7	Are there signs appropriately located to warn golfers of hazards around or near recycled or otherwise non-potable water?	✓		
8	If applicable, have areas of the course been designated "Environmentally Sensitive Zones" per USGA rules?			✓
9	Are course staff members trained regularly on how to improve their dealings with customers?	✓		
10	Are there clinics provided to teach beginning golfers the basics of the game and to teach all levels of golfers the rules of the game?	✓		
	<b>Point totals for each column</b>	<b>7</b>	<b>2</b>	<b>1</b>

<b>Miscellaneous Special Projects &amp; Activities</b>				
<b>#</b>	<b>Environmental Compatibility Indicator</b>	<b>Yes</b>	<b>Partial</b>	<b>No</b>
1	Are there projects planned and funded for the near future that would demonstrate the compatibility of the course's management methods with protection of the environment?	✓		
2	Are there projects planned and funded to reduce the course's potential negative environmental impacts?	✓		
3	Are there tournaments or other events planned that may educate customers on the environmental challenges faced by the golf staff at this installation?			✓
4	Are there regular field trips for local students or other community groups hosted at the course?	✓		
5	Are there projects planned to eliminate or minimize a potential erosion problem?	✓		
6	Does the course have a native tree installation program complete with planting plan and maintenance schedule?			✓
7	Are any of the local schools or universities involved in educational or research activities at your course?	✓		
8	Are there special facility-wide recycling programs underway?	✓		
9	Is your course an active participant in the USAF Golf Environmental Management Program?	✓		
10	Has your facility been nominated by your MAJCOM for the golf course environmental management award in the last 3 years?			✓
	<b>Point totals for each column</b>	<b>7</b>	<b>0</b>	<b>3</b>

## ECQ Summary

#	Environmental Compatibility Quotient Category	Yes	Partial	No
1	Overall Management Philosophy & Documentation	5	3	2
2	Safety, Training, & Awareness	8	2	0
3	Compliance	8	1	1
4	Pesticide Use, Storage, & Handling	10	0	0
5	Pollution Prevention	8	1	1
6	Conservation Practices	9	1	0
7	Water Resources	9	0	1
8	Maintenance Practices	7	2	1
9	Customer Relations & Education	7	2	1
10	Miscellaneous Special Projects & Activities	7	0	3
	<b>Composite point total/response percentage</b>	<b>78</b>	<b>12</b>	<b>10</b>

### GCEBA Results

#### \* Palm Tree Golf Course, Andersen AFB, Guam

- Actual ECQ (# of "Yes") = 78 "Showing progress"

- Potential ECQ (Actual ECQ plus "Partial") = 90 "Getting there"

## Potential environmental challenges

One of the important results of the GCEBA process is the identification of potential environmental challenges (ECs) to be addressed in the long-term GEM Planning process. After confirming each EC, the golf staff will determine the best management approach that will satisfy the goals of the golf facility from the course playability and customer satisfaction perspectives first. Then the golf staff's preferred management approach should be coordinated with the installation's environmental staff for refinement, coordination, and approval.

Ultimately, the combined environmental and golf staff team should proceed toward finalizing the GEM Plan. The entire process can be viewed at the AFCEE GEM website (<http://www.afcee.brooks.af.mil/ec/golf/>).

The following potential environmental challenges were identified during the GCEBA process:

- New mission beddown initiative
- Water resource management
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- Invasive exotics

## NEW MISSION BEDDOWN INITIATIVE

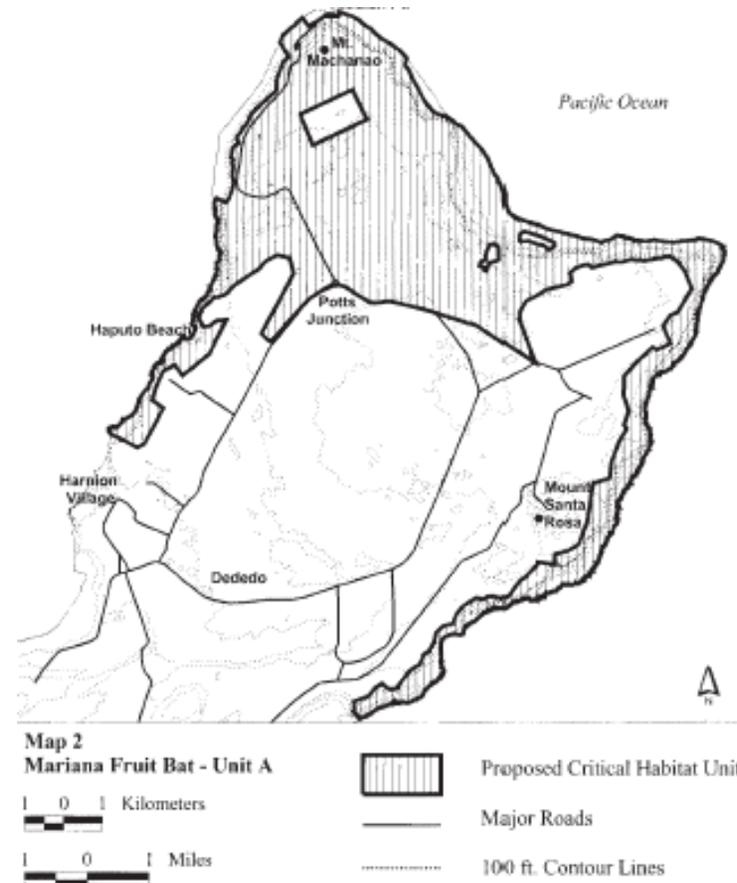
Due to uncertainties in the overall security of the region, changes are in the works for Andersen AFB. Some of these changes are embedded in the new mission beddown initiative that includes a yet to be quantified contingent of new military family housing. The Palm Tree Golf Course seems to be one of the favorite sites for this particular project. There is a highly sensitive native limestone forest just below the golf course on the east that must be protected from major impacts as confirmed by the U.S. Fish & Wildlife Service and the U.S. Environmental Protection Agency. In all likelihood, the course will be adjusted.



*Although this graphic is not one of the current proposals, it is obvious that the golf course could potentially be greatly impacted.*

## WATER RESOURCE MANAGEMENT

The island of Guam is extremely isolated. Water for drinking, washing, and irrigation is obtained from wells that tap a “lens” of fresh water. Over use or contamination of this resource would be disastrous for the island and its people. Accordingly, the U.S. Air Force and its mission at Andersen AFB is absolutely committed to preserving the quality and quantity of its water resources. The golf staff must ensure that all of their management practices are examined for potential impacts to water quality prior to acting. Somehow they must now include the unwanted and uncoordinated impacts of new stormwater discharges into the golf course property from other Andersen properties “upstream”.



*This “monument” to the power of stone and mortar intrudes visually and functionally on the golf course property. Additional culverts have been installed nearby with no consideration for impacts to the course.*

## THREATENED & ENDANGERED SPECIES

According to the INRMP, Andersen AFB “supports remnant populations of the Mariana crow, Guam rail, Mariana fruit bat, the Government of Guam endangered Micronesian starling, a number of migratory seabirds and shorebirds, and threatened and endangered sea turtles. Obviously, this is enough information to garner the course’s attention. Again, the goal is to minimize or eliminate impacts.



*Palm Tree's greens are in dire need of renovation.*

### **GREENS RENOVATION & IRRIGATION PROJECTS**

Much to the delight of Andersen commanders and Palm Tree Golf Course management, the course is on the list for new greens and new irrigation. Unfortunately, the projects may have to be constructed separately, possibly removing potential economies of scale along the way. The course sits high above the native limestone forest. The installation is currently dumping excessive stormwater on the course. The island has limited water resources. The new mission beddown initiative could significantly alter the golf course. Best solution is to work all of these issues together. Redesign the course, if necessary. Create a lined, irrigation pond to collect stormwater and protect the forest. Redo the

irrigation system along with the greens project and leave behind an efficient, attractive, and economically viable recreation resource. Do it any other way and many of these opportunities will probably be lost.

### **INVASIVE EXOTICS**

Andersen AFB is home to several alien plants and animals that are threatening to native species. None begins to approach the brown tree snake for overall impacts. Phenomenal efforts have been taken to eliminate the snake to little or no avail. Other species of concern include monitor lizards, Phillipine deer, feral pigs, tangantangan, passionfruit, and bitter melon. Several other species have become noxious weeds on the island as well. Golf course management must coordinate their efforts to assist in eliminating these species with environmental staffers.



*The brown tree snake has decimated Guam's wildlife and threatened human safety.*



## Conclusion

Palm Tree's Director of Golf, Al Beck, and his staff have made significant inroads on getting the course back to an acceptable quality for their customers. The future presents challenges as well as there are major projects on the horizon. Typically, a greens renovation or irrigation system replacement by themselves can be a major concern for all involved. Further complicate the matter with the potentially impacting new mission beddown initiative and you have one of the most unstable futures for any manager. Teamed with his superintendent, Russell Young, one of the best in the U.S. Air Force, Beck can at least be comforted that he is prepared to make the best of the situation.



## Areas needing improvement

The ECQ Summary on the previous page highlights the following areas for relative improvement:

- Overall Management Philosophy & Documentation

## The gallery

This section of the report will be where some of the more revealing photographs (of the literally hundreds taken during the site visit) of pests, maintenance practices, and other areas where improvements may be made to create the best possible golf facility within the limited budget and support of the mission.



*The native limestone forest borders nearly half of the golf course..*



*Limestone remnants are unique hazards at Palm Tree Golf Course.*



*Culverts deposit water from upstream into the course..*



*Andersen's youth golf program is going strong.*



*Natural limestone outcropping along the edge of the 17th fairway.*



*The snack bar serves many customers during lunch.*



*Maintenance complex is outfitted for proper equipment care.*



*The limestone forest can be a hazardous place for golfers.*



*Turf quality is a major headache for Superintendent, Russell Young..*



*The maintenance complex may be the best golf course facility.*



*The course is characterized by rolling, relatively featureless land.*



*The 7<sup>th</sup> green provides a wonderful vista.*



*Palms are about the only trees that thrive in the course's poor soils.*



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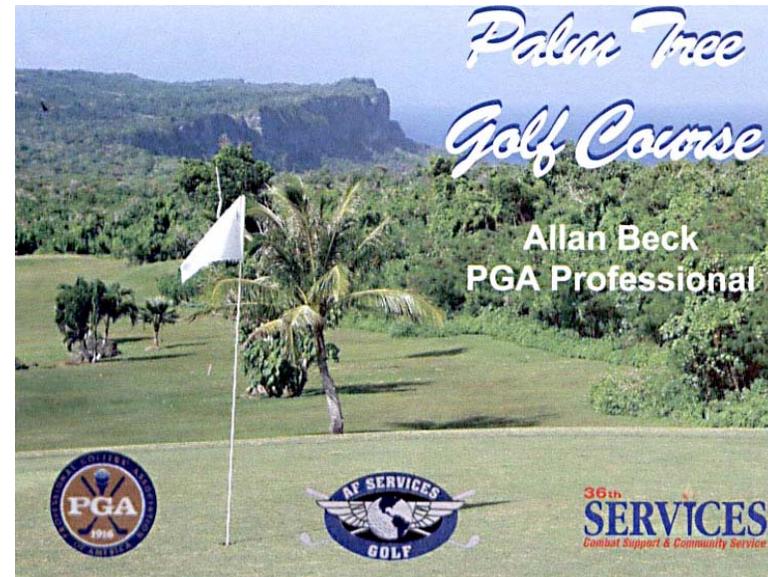
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**Air Force Center for Environmental Excellence  
Technical Directorate  
Environmental Science Division**

For additional assistance or more information, please contact:  
**U.S. Air Force GEM Program Manager – 210-536-3719 - DSN 240-3719**  
**AFCEE/TDE, 3300 Sidney Brooks, San Antonio, TX 78235-5112**

Please visit our Golf Course Environmental Management Program website:  
**<http://www.afcee.brooks.af.mil/ec/golf/>**