



**Whispering Pines Golf Course
Environmental Management Plan
Columbus AFB, MS
February 2007**



Whispering Pines Golf Course Environmental Policy Statement

In concert with the Columbus AFB mission, Whispering Pines Golf Course management pledges to employ management practices that minimize or eliminate the potential for negative impacts to the environment and the surrounding community whenever practicable. In addition, the Director of Golf is committed to ensuring compliance with all appropriate regulations, and to consistently review our processes to balance the highest standards of environmental excellence with standards of aesthetic quality expected at this installation's prominent golf course.

Ricky Magers, Director of Golf

Richard Bryde, Golf Superintendent

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 (76) Showing Progress
Potential ECQ (88) Showing Progress

Final environmental challenges

The following environmental challenge was identified during the GEM Plan process:

- Water Quality

Where do we go from here?

The true measure of a successful GEM program is how well is it executed in the field each and every day. The installation golf and environmental staffs should continue to analyze, document, monitor, evaluate, revise, and implement changes based on lessons learned. The GEM Plan should be updated annually and revised during the next INRMP iteration update. The entire GEM process can be found on the regularly improved AFCEE GEM program website (<http://www.afcee.brooks.af.mil/ec/golf/>).

Analysis

Course details

Architect	Unknown
Year constructed	Circa 1947
Climate	Hot, humid summers & Mild winters
Average annual rainfall	40-60 inches, with dry periods occurring most summers
Average growing season	200-300 days, with frost occurring nearly every year
Winds/Prevailing Direction	SW to NE
Total Facility Acreage	50 acres + 5 for driving range
Par	35-35-70 (9 holes)
Yardage/Rating/Slope	Tee- Yards/Rating/Slope White/Blue- 5293/ Total yardage 5300 Men's slope 128 Ladies Slope 120 Ladies Slope 120 Men's Course Rating 66.7 Ladies Course Rating 67.0
Turfgrass	Tees- Bermuda (Tif Green 328)
	Fairways- Bermuda (Tif Green 328)
.....Greens	Bermuda (Tif Dwarf 419)
	Roughs- Bermuda (Tif Green 328)

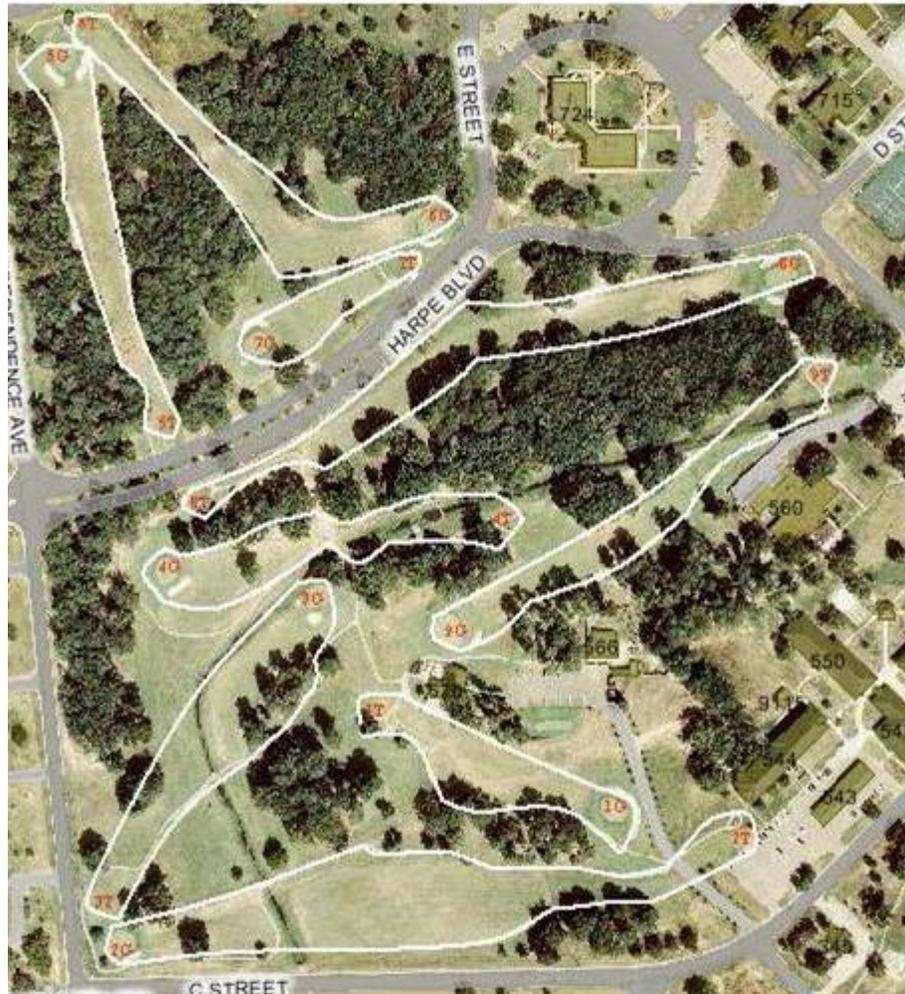
Course description

Whispering Pines Golf Course was built in the 1940s by the Civil Engineering Squadron at the heart of Columbus AFB, adjacent to wing headquarters and near the south gate of the installation. It is located in the southwestern portion of the installation. The course is relatively short as it features nine holes, and has been wedged into a small area of land between the dormitories, wing headquarters, Independence Avenue, and military family housing. There are many trees on the course, owing to its position away from the airfield. In addition, a creek runs through the golf course, adding challenging elements to the game and a natural aesthetic to the course.



Pine and juniper trees line the tee on hole one.

Whispering Pines Golf Course Hole Layout Map



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).



An attractive granite sign adorns the entry to the pro shop.



A beautiful creek winds through the golf course.

Environmental Flight

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
90-100%	Advanced (Green)
70-89%	Showing progress (Yellow)
69% or less	Getting started (Red)

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

Overall Management Philosophy & Documentation				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Has installation environmental and golf 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 available, used in the environmental management decision-making process, and is it posted for customers?	✓		
5	Are environmental challenges and their management method, target, and objective, and overall golf course GEM program goals evaluated at least annually and are they regularly communicated to employees, customers, management, and the local community?			✓
6	Are written records of water quality monitoring activities, results, and control measures collected and readily available?	✓		
7	Is there an inventory of bird and mammal species 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 considered prior to their use as part of the course environmental management planning process?	✓		
10	Are records of pest treatments and their effectiveness maintained and used to guide future pest control decisions?	✓		
	Point totals for each column	9	0	1

Safety, Training, & Awareness				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are all golf course employees familiar with the GEM program and are they trained on the importance of environmental compliance with the goals and objectives of the program as it applies to their specific duties?		✓	
2	Are all appropriate employees trained to be familiar with U. S. Air Force, federal, state, and OSHA regulations that apply to the storage, handling, and disposal of all chemicals potentially used on the property?	✓		
3	Are all employees aware of the potential risks to human health and the environment of chemical use, storage, and disposal?	✓		
4	All appropriate employees receive documented training on practices that may adversely impact worker health, on- and off-site water quality, and wildlife species and their habitats?	✓		
5	Is a current copy of Material Safety Data Sheets (MSDS) for all chemicals used anywhere on the golf course property maintained and readily available for use by regularly trained employees?	✓		
6	All employees receive regular, documented training on all potential OSHA issues associated with their specific duties?	✓		
7	Are all golf course pesticide applicators active participants in a respiratory and pulmonary testing program?	✓		
8	Are all 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 planned or recently completed spraying of any chemical or fertilizer that may potentially be hazardous to human health or general public safety?	✓		
10	Are key staff members trained regarding water quality and conservation issues pertinent to the course and their particular duties?	✓		
	Point totals for each column	9	1	0

Compliance				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are the fuel storage/delivery area and associated equipment managed in accordance with federal, state, and local regulations?	✓		
2	Are installation environmental staff members regularly consulted on pertinent course management discussions and plans?	✓		
3	Are there golf course staff meetings where environmental management issues are regularly discussed with all employees?	✓		
4	Do the director of golf and the superintendent attend all internal and external ESOHCAMP in-briefings and out-briefings?		✓	
5	Do the director of golf and/or the superintendent coordinate their input on the various management plans that affect or include the golf course with installation environmental staff?	✓		
6	Have all environmental challenges been physically identified and mapped to aid the golf staff's daily management efforts?	✓		
7	Has appropriate impact analysis (NEPA) been performed on all proposed actions on or affecting the golf course property?	✓		
8	Are oil containers used to collect old oil in good condition and correctly labeled?	✓		
9	Has the golf course staff assisted the installation environmental staff with the required Golf course Environmental Management Plan requirements?	✓		
10	Were there less than two major golf course facility-related findings during the last official ESOHCAMP visit?	✓		
Point totals for each column		9	1	0

Pesticide Use, Storage, & Handling				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are there trained scouts on staff other than the superintendent to monitor turf and plant pest populations that notify management include findings into a report or guide for future use?		✓	
2	Are there written pest profiles of common pest species with a variety of potential control measures including cultural, biological, physical, and mechanical controls prior to treating the problem on the course?	✓		
3	Are there established, documented, and utilized aesthetic and functional thresholds for effective management of pests that may also 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 all pesticides and other chemicals stored or used at the golf facility recently been provided to the appropriate Fire Department(s)?	✓		
6	Is there a written, readily available, and regularly updated Integrated Pest Management Plan for the entire golf course 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? - the quantity of each pesticide used; - the chemical or common name of the active pesticidal ingredient(s); - the pest or purpose for which the pesticide was applied; and the date and place of application.	✓		
9	Is the chemical storage structure/area well ventilated, fire resistant, and locked with 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?			✓
Point totals for each column		7	2	1

Pollution Prevention				
#	Environmental Compatibility Indicator	Yes	Partial	No
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	Is there a readily available copy of the Installation Spill Plan that includes the golf course facility and is there a spill containment kit at each required location with 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 appropriate pallets or shelves to keep them off the floor?	✓		
6	Do all golf facility employees regularly receive documented and approved HAZCOM and safety and health training?	✓		
7	Are grass clippings removed from 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?	✓		
10	Are appropriate quantities of fertilizers applied during weather conducive to reducing the potential for leaching and runoff?	✓		
Point totals for each column		9	0	1

Conservation Practices				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are recycling containers conveniently provided for customer and employee use throughout the golf course facility?	✓		
2	Are there appropriately designated and mapped 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 irrigation system flow meters been installed to monitor water use and detect potential waste?			✓
6	Has the entire golf course facility property been examined for landfills, critical habitats, threatened or endangered species, wetlands, floodplains, and historical/cultural resources or other environmentally sensitive features?	✓		
7	Are employees encouraged to minimize their trips around the course to conserve on the use of fossil fuels and minimize potentially harmful exhaust emissions?	✓		
8	Do the restaurant and/or snack bar utilize reusable plates and silverware for use by customers throughout the facility’s operating hours?	✓		
9	Have the annual maintenance practices for the officially designated “minimally-maintained” or natural areas been coordinated with the installation Bird/Wildlife Aircraft Strike Hazard (BASH) officer and installation environmental management personnel?			✓
10	Are all motorized golf course equipment regularly checked for excessive air polluting emissions?	✓		
	Point totals for each column	7	0	3

Water Resources				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are water features regularly monitored for algae, erosion, excessive aquatic plant growth, fish kills, and sedimentation?	✓		
2	Are equipment wash or wastewater kept from directly entering surface water and are they recycled or allowed to filter through a vegetative area?	✓		
3	Are outdoor irrigation of non-golf course landscape areas regularly monitored and maintained for leaks and efficient performance?	✓		
4	Has the golf course staff coordinated with the installation’s environmental staff on potential storm water management planning requirements?	✓		
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, natural, or water feature areas?	✓		
6	Are all water feature maintenance tasks coordinated with the installation Bird/Wildlife Aircraft Strike Hazard (BASH) officer and installation environmental management personnel?	✓		
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 that pass through the golf course such as streams or creeks regularly monitored both upstream and downstream of the course for overall water quality?	✓		
9	Does the facility have an approved written and readily available Drought Management Plan if, or when irrigation restrictions may be required by the community or the installation?			✓
10	Is there a comprehensive, up to date, and readily available written Water Feature Management Plan for the entire golf course facility?			✓
	Point totals for each column	7	1	2

Maintenance Practices				
#	Environmental Compatibility Indicator	Yes	Partial	No
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, and Hazard Communication?	✓		
3	Are green, tee, and fairway mowing heights maintained at reasonable levels that do not unduly stressing turf or requiring additional chemical inputs?	✓		
4	Are there regular and documented procedures in place to continually improve overall course soil health such as topdressing, organic amendments, aeration, and drainage improvements?	✓		
5	Is there an up to date and readily-available map of the course's "hot spots", or those areas requiring special care or regular attention?	✓		
6	Is all maintenance equipment maintained and cleaned in a manner that minimizes or eliminates the potential for spreading of pest or disease contamination?	✓		
7	Has there been a complete examination of all aspects of the golf course facility operation (including the snack bar and grill, clubhouse, pro shop, cart storage facility, and maintenance complex) for potential negative environmental impacts?	✓		
8	Is contour mowing used to conserve fuel and increase playability and aesthetics?	✓		
9	Have all playing surfaces been inventoried and mapped for potentially agronomically challenging soil types?	✓		
10	Are soil tests and plant tissue analysis used to determine nutritional requirements?	✓		
	Point totals for each column	10	0	0

Customer Relations & Education				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are the course manager and superintendent involved in an on-going and documented customer environmental management educational program?		✓	
2	Is there a highly visible location at the course or clubhouse where golf course environmental management notices and informational messages are regularly posted for the education and enjoyment of customers?	✓		
3	Do the course manager and superintendent actively communicate with customers to determine their points of view?	✓		
4	Is there documented, regular communication by course management with installation civil engineering, environmental, and leadership on GEM program issues or concerns?		✓	
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 regularly trained on how to improve their dealings with customers?	✓		
10	Are there clinics provided to teach beginning golfers the basics of the game to include the rules as well as the environmental challenges faced by the golf staff at their facility?	✓		
	Point totals for each column	8	2	0

Miscellaneous Special Projects & Activities				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are there projects planned and funded for execution in the near future that would demonstrate the compatibility of the course's management methods with GEM program initiatives?		✓	
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?			✓
4	Are there regular field trips hosted at the course for local students or other community groups?			✓
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?			✓
	Point totals for each column	3	3	4

ECQ Summary

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

Checklist GCEBA Results compiled in February 2007

Whispering Pines Golf Course, Columbus AFB, MS

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

- Potential ECQ (Actual ECQ plus "Partial") = **88** (Yellow, Showing progress)

* = Category requires improvement or attention

Environmental challenges

One of the important results of the GCEBA process is the identification of potential environmental challenges to be addressed in the long-term GEM Planning process. After determining the relative significance and validation of each potential environmental challenge, the installation golf and environmental staffs should determine the set of final challenges that will be actively managed in the GEM Plan. Armed with the list of final environmental challenges, the golf staff should determine the best management approach that satisfies the goals of the golf facility from the course playability and customer satisfaction perspectives. 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:



Runoff from the airfield drains through the golf course.

FINAL ENVIRONMENTAL CHALLENGE

The following final environmental challenge was identified during the GEM Plan process:

- Water quality

Image removed due to the perceived potential security threat.

Whispering Pines Golf Course Environmental Challenge Map

WATER QUALITY

- Maintaining high standards of water quality in the creek is a challenge due to runoff from the flightline.

Management Practice

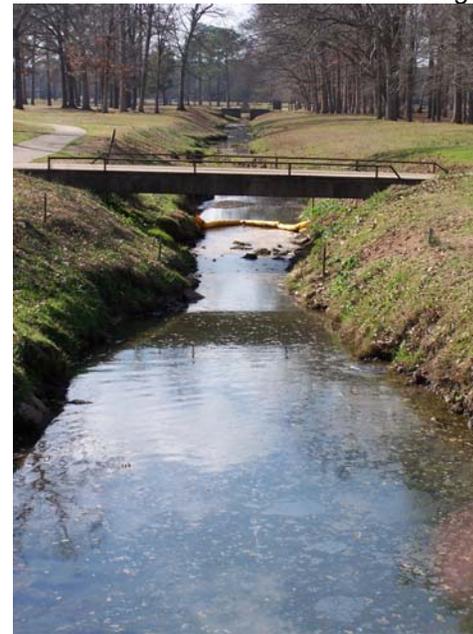
- Spill containment boom has been installed at the headwaters of the creek.
- Condition of creek is monitored by golf course personnel on a regular basis.
- Unfavorable or unusual conditions are reported to the water quality manager for evaluation and action.

Target

- Golf course management, natural resources, and grounds maintenance personnel are forming a Resource Advisory Group to help plan and implement best management practices for the golf course.

Objectives

- Continue monitoring water quality in the creek.
- Identify and communicate best management practices to improve water quality.



Boom installed on far side of bridge restrains runoff from flightline.



Spill gate installed near hole 4 prohibits spills from leaving the installation in emergencies.

GEM Plan goals & objectives

Goals are defined as actions or results that should be accomplished in the next year.

Goals:

- Whispering Pines Golf Course will form a Resource Advisory Group in conjunction with Natural Resource Management, Water Quality Management, and Grounds Maintenance to identify and implement best management practices to protect water quality and ensure environmental compliance.

Objectives:

- Continue monitoring water quality in the creek.
- Identify and communicate best management practices to improve water quality.
- The group should serve as a forum to resolve all environmental issues arising on the golf course.



The Resource Advisory Group will work together to maintain high water quality standards for Whispering Pines Golf Course.

Best practices are defined as any action, method, practice, or result that has proven its value and worth over time. The GEM program has been designed to create a body of scientific data to share with all U.S. Air Force installation golf and environmental staff members.

GEM Plan best practices

- Collect data to establish baseline conditions for water quality.
- Develop a plan to control the spread of pine-damaging insects to endemic (non-threatening) populations.
- Implement landscape designs that are site-appropriate and minimize the amount of irrigation and labor needed for grounds maintenance.
- Purchase landscape plants from locally-grown sources, whenever possible, to support the genetic integrity of local native plant communities.
- Restore degraded habitats, such as eroded slopes, compacted soils, polluted water sources, or areas overrun with invasive exotic species.
- Clean up trash from habitat areas when necessary.



Conclusion

The Civil Engineering Squadron's unit natural resource program manager should provide the key oversight to assist in improving the ability of the golf and environmental staffs to work together to better support the Columbus AFB mission.

This report has identified one environmental challenge for Whispering Pines Golf Course. Maintaining high standards of water quality in the creek is a challenge due to runoff from the flightline. The proposed solution involves the creation of a Resource Advisory Board. This Board would include personnel from the golf course, the environmental flight, and the QAE for the grounds maintenance contract. This group would meet periodically to discuss and implement new programs to resolve this challenge and any other environmental concerns that may arise.

The gallery



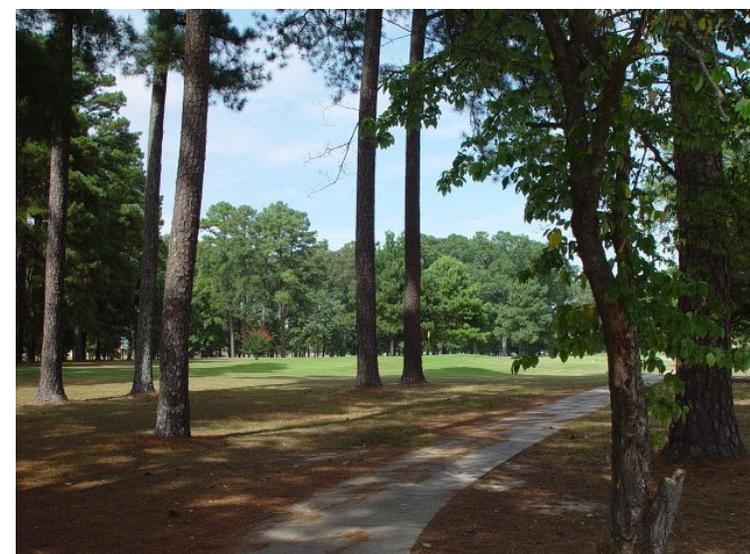
Lush trees create dappled shade on the fourth hole tee.



Proper signage and spill containment characterize the above ground fuel storage tank.



Frequent tournaments generate crowds at the golf course.



Majestic pines line the cart path near hole seven.



Erosion control measures are implemented as needed.



Proper storage includes solids stored over liquids.



The golf course provides recreation opportunities for everyone.



Hole six green framed by vegetation



Bibliography

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Environmental Assessment: Golf Course Irrigation System, January 2007, SpecPro Environmental Services, LLC.

Environmental Assessment: Clean/Stabilize Ditches at Golf Course and "C" Street, July 2003, Frank Lockhart, 14 CES/CEV





**Air Force Center for Environmental Excellence
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Natural Infrastructure Division**

For additional assistance or more information, please contact:
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Please visit our Golf course Environmental Management (GEM) Program website:
<http://www.afcee.brooks.af.mil/ec/golf/>