



***Breckland Pines Golf Course***  
**Environmental Management Plan**  
**RAF Lakenheath, England Aug 07**



# ***Breckland Pines Golf Course Environmental Policy***

**In concert with the  
RAF Lakenheath mission,  
we pledge to employ  
only those management practices  
that minimize or eliminate the potential  
for negative impacts to the environment  
and the surrounding community,  
ensure compliance with all appropriate regulations,  
and to constantly reevaluate our processes  
to achieve the highest standards  
of environmental excellence.**



## 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, 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 **70**  
Potential ECQ **83**

### Final environmental challenges

The following environmental challenges were identified during the GEM Plan process:

- Bird/Wildlife Aircraft Strike Hazard (BASH)
- Aquifer protection
- Species protection
- Proposed Large Vehicle Inspection Station (LVIS) project

### 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

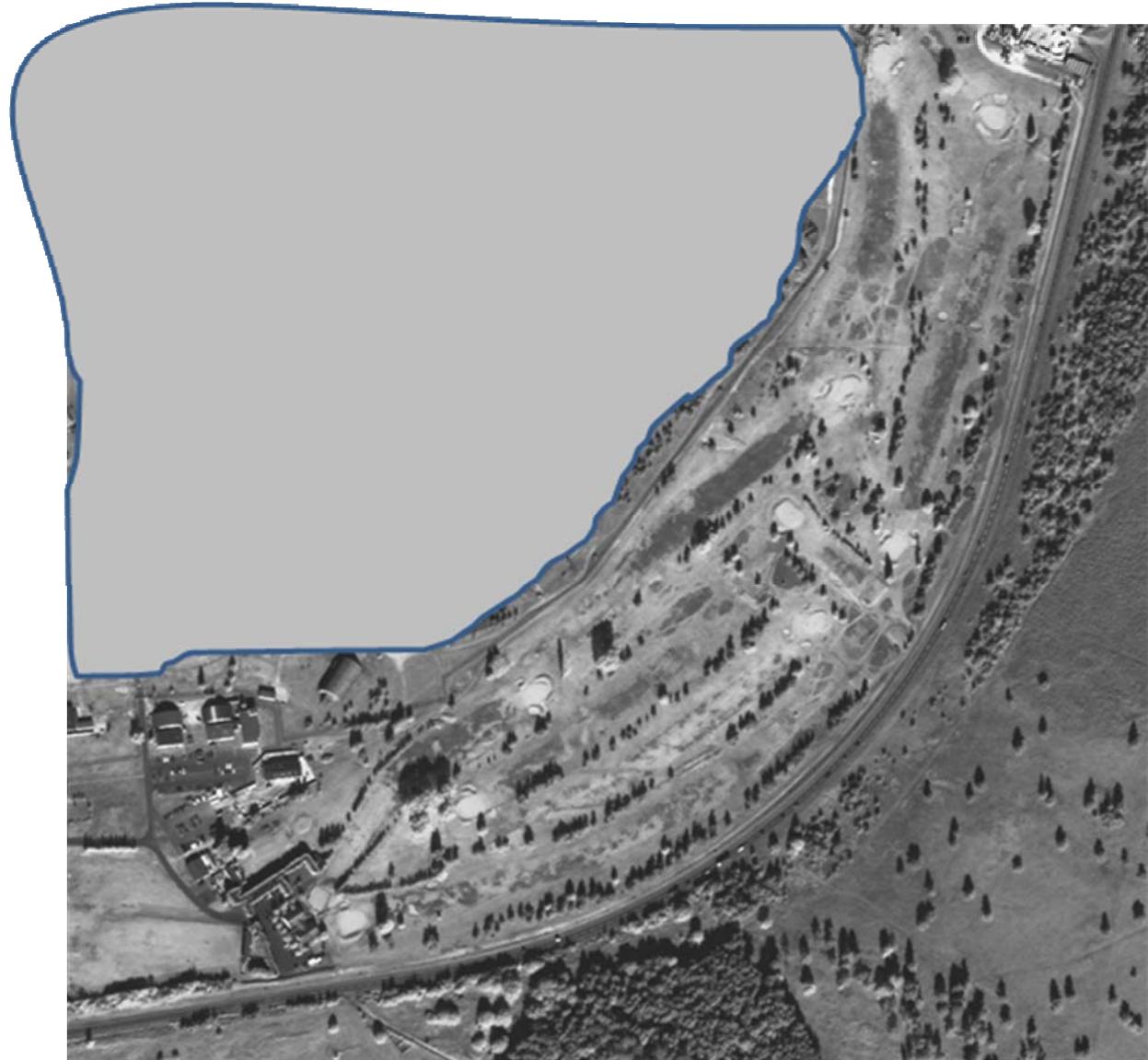
Architect	Civil Engineering
Year constructed	1952
Climate	Semi-continental
Average annual rainfall	762 mm
Average growing season	220 days
Winds/Prevailing Direction	S. SW / N. NE
Total Facility Acreage	45 acres
Par	36 (9-hole facility)
Yardage/Rating/Slope	Yellow- 3305/68.8/104 White- 3130/67.8/103 Red- 2820/66.8/102
Turfgrass	Poa annua/ Fescue mix
Tees-	Poa annua/ Fescue mix
Fairways-	Browntop bent/Poa annua
Greens	Mix
Roughs-	
Irrigation water source	Borehole (non-potable)

## Course description

One of the most enjoyable 9-hole tracks around, Breckland Pines Golf Course makes the most of its tight, 45-acre parcel. Wedged between the airfield and a community highway, the gently rolling terrain is spotted with patches of aromatic, lavender-flowered heather. The diminutive greens toughen the challenge while offering an equitable examination with interesting contouring and unique bunkering.



Breckland Pines Course Layout



**Breckland Pines 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)



*The 1<sup>st</sup> requires a soft fade off the tee.*

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



*Clubhouse is located directly behind the 1<sup>st</sup> tee.*



*Teeing areas are simple yet functional.*

<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 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?	✓		
	<b>Point totals for each column</b>	<b>6</b>	<b>1</b>	<b>3</b>

<b>Safety, Training, &amp; Awareness</b>				
<b>#</b>	<b>Environmental Compatibility Indicator</b>	<b>Yes</b>	<b>Partial</b>	<b>No</b>
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	Do all maintenance employees receive documented training on their work duties that may adversely impact 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/or 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?		✓	
	<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 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?	✓		
	<b>Point totals for each column</b>	<b>7</b>	<b>1</b>	<b>2</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 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?	✓		
<b>Point totals for each column</b>		<b>8</b>	<b>1</b>	<b>1</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	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?	✓		
	<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 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 maintenance practices for the 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?	✓		
<b>Point totals for each column</b>		<b>7</b>	<b>2</b>	<b>1</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 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?	✓		
<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, 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 to identify potentially challenging soil types?	✓		
10	Are soil tests and/or 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 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?		✓	
	<b>Point totals for each column</b>	<b>5</b>	<b>1</b>	<b>4</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 project(s) 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 project(s) 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 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>5</b>	<b>2</b>	<b>3</b>

## ECQ Summary

#	Environmental Compatibility Quotient Category	Yes	Partial	No
1	Overall Management Philosophy & Documentation	6	1	3
2	Safety, Training, & Awareness	8	2	0
3	Compliance	7	1	2
4	Pesticide Use, Storage, & Handling	8	1	1
5	Pollution Prevention	8	1	1
6	Conservation Practices	7	2	1
7	Water Resources	9	0	1
8	Maintenance Practices	7	2	1
9	Customer Relations & Education*	5	1	4
10	Miscellaneous Special Projects & Activities*	5	2	3
	<b>Composite point total/response percentage</b>	<b>70</b>	<b>13</b>	<b>17</b>

### Aug 07 - Breckland Pines Golf Course, RAF Lakenheath, England

- Actual ECQ (# of “Yes”) = **70** (Showing progress “**Yellow**”)
- Potential ECQ (Actual ECQ plus “Partial”) = **83** (Showing progress “**Yellow**”)

\* = 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.

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:

- Bird/Wildlife Aircraft Strike Hazard (BASH)
- Aquifer protection
- Garden chafer beetle



*One less environmental challenge – new maintenance complex eliminated one of the worst in the U.S. Air Force.*

## FINAL ENVIRONMENTAL CHALLENGES

The following final environmental challenges were identified during the GEM Plan process:

- Bird/Wildlife Aircraft Strike Hazard (BASH)
- Aquifer protection
- Species protection
- Proposed Large Vehicle Inspection Station (LVIS) project

**Image removed due to a perceived potential security threat.**

## **Breckland Pines Golf Course Environmental Challenges**



*Cypresses do a good job of screening and housing rooks.*

### **BIRD/WILDLIFE AIRCRAFT STRIKE HAZARD (BASH)**

According to the BASH Plan, “the golf course is near the runway environment” at RAF Lakenheath. The installation has adopted a “short grass policy” since the airfield’s soil is largely sand and “cannot support grass height greater than 3 to 5 inches” says the BASH Plan. Many expensive solutions have been suggested with little to no support. The mission of the installation is protected through total coordination from all functions near the airfield. The golf course turf harbors one of the largest bird attractants - the garden chafer grubs. Thankfully, there is an approved method for their “control”. Large numbers

of rooks can congregate on the course searching for a quick meal during heavy infestation periods. According to the BASH Plan, “Stone Curlews, protected under the European Bird Directive (Council Directive/409/EEC) have been known to reside on base and require protection and management during future nesting seasons”. The Plan lists waterfowl, gulls, pigeons, doves, swallows, swifts, starlings, crows, and rooks as the main BASH hazards at Lakenheath.

The golf course has several stands of Arizona cypress that rooks seem to prefer for roosting and nesting. The main problem is the cypresses near the clubhouse parking areas. There has been discussion of removing these upright-growing evergreens when funding is available.

#### **Driver/requirement**

- Unified Facilities Criteria (UFC) 3-260-01, Planning and Design of Airfields

#### **Objective**

In direct support of the RAF Lakenheath mission, the Breckland Pines golf staff shall continue to cooperate and assist installation environmental management staff with BASH reduction efforts.

#### **Management Practices**

- Secure membership on BASH Working Group and attend all meetings
- Continue to pursue project funds to accomplish removal of Arizona cypress trees

## Target

Eliminate 25% of the BASH conditions prior to the next iteration of the INRMP.



*Although greatly reduced from past years, there is still some damage from birds seeking a meal of chafer beetle grubs.*

## AQUIFER PROTECTION

The INRMP states “chalk found in the south and east of England is part of a major aquifer. The aquifer is largely unconfined and recharged directly from rainfall. Since there is no confining layer above, the aquifer is highly vulnerable to contamination from anthropogenic [man-made] sources, especially fertilizers and pesticides”.... Since the installation, to include the golf course, is located directly over this important source of regional drinking water, this should be the highest priority issue for both the

installation and golf course managers. One of the planning tools used to assist in the protection of groundwater is Source Protection Zones (SPZs), which support England’s groundwater protection policy by designating areas that may be at risk to potential degradation. The INRMP lists “principal contaminants detected in the aquifer include PCE, TCA, TCE, PAHs, simazine, atrazine, diuron, monuron, and high levels of nitrate”.

Parts of the installation have been designated as in Protection Zone 1. The maintenance staff may consider eliminating slow release fertilizers as they may pass through the sandy soils to the groundwater below. In addition, any and all chemical use must consider the aquifer below first.

According to the Pest Management Plan, “The Civil Engineering Environmental flight has received approval for the use of Nemasys G. No DEFRA number has been assigned to Nemasys G as it is classified as a Biological Control not a pesticide. Nemasys G will be applied by RAF Lakenheath golf course management, with the manufactures assistance (Becker Underwood) to apply a parasitic nematode to the course fairways to control chafer grub activity. The use of this Biological control will be monitored and controlled through the base pest management plan. All necessary health and safety requirements are to be followed in accordance with the manufactures instructions.”

### Driver/requirement

- Environment Agency Groundwater Protection Policy

### Objective

Eliminate the possibility of potentially degrading the quality of the groundwater under the golf course.

### Management Practices

- Continue to use minimal amounts of only approved pesticides
- Ensure that spill kits and procedures are in place wherever required
- Insist on regular training provided by the installation environmental staff to decrease the likelihood of poorly managed maintenance activities

### Target

Through constant monitoring of all pertinent activities and increased education and training of all relevant employees reduce the occurrences of a potentially aquifer polluting event to zero.



*This borehole serves as the source of irrigation water for Breckland Pines Golf Course.*

### SPECIES PROTECTION

The INRMP states “The European Union (EU) developed the Habitats Directive to meet commitments made at the Earth Summit in Rio de Janeiro in 1992. The Habitats Directive, along with the 1979 Directive on the Conservation of Wild Birds (Birds Directive), requires establishment Natura 2000 sites. Most of these sites are already designated and protected as part of the SSSI process, and several hundred of the SSSIs have been carefully selected to form Natura 2000. The network includes Special Protection Areas (SPA) for birds designated under the EU Birds Directive; and Special Areas of Conservation (SAC) for other habitats and species protected under the EU Habitats and Species Directive”.



*Natural areas abound on the edges of Breckland Pines.*

### **Driver/requirement**

- The Wildlife and Countryside Act (WCA) 1981 (as amended)
- European Union Habitats Directive

### **Objective**

The golf staff shall maintain constant compliance with all installation environmental management direction on species protection.

### **Management Practices**

- Continue regular mowing to keep conditions favorable for protected species by producing a characteristic Breckland Sward of 30 to 50mm in height.

### **Target**

Never allow any course management practice to damage any of the protected habitats or species.

### **PROPOSED LARGE VEHICLE INSPECTION STATION (LVIS) PROJECT**

Breckland Pines' staff members have been coordinating this important project with installation planners from its inception. The large vehicle inspection station (LVIS) will require relocating at least one green and one teeing area. The access road will parallel local highway A1065 as well as the 5<sup>th</sup> and 9<sup>th</sup> holes just skirting the 6<sup>th</sup> tee. The construction will be performed in the coming year.

There is minor concern over the quality of the golf course construction that will be accomplished early in the project. Impacts to the golf course from the LVIS project include lost yardage on the 5<sup>th</sup> hole, loss of trees on the 5<sup>th</sup> and 9<sup>th</sup> holes along A1065 and the driving range, new fence along A1065, rebuilding of the 4<sup>th</sup> green with new irrigation system, and reshaping of the 4<sup>th</sup> teeing area.



*The “LVIS” project will impact this portion of the golf course most.*

### **Driver/requirement**

- Homeland Security Act
- Force protection

### **Objective**

Ensure that all construction work impacts to the golf course are minimized.

### **Management Practices**

- Work to ensure new golf course construction items are designed and built according to golf staff desires, are maintainable, and in character with the remainder of the existing course

### **Target**

Diligently “supervise” work to minimize impacts to course and its customers while maximizing long term benefits to the facility.



*“LVIS” create a wider road between the installation boundary fence requiring the removal of hundreds of trees. New trees will be part of the construction along with a tall fence between the road and the golf course to help screen potentially unsightly views.*

## GEM Plan goals & objectives

Goals are defined as actions or results that should be accomplished in the next year. A detailed description of these should be inserted here.

- Ensure that all employees are familiar with the GEM program principles
- Complete and document all hazard communication and safety training for all appropriate employees

Objectives are defined as actions or results that are desired to be accomplished prior to the next INRMP update.

- Establish aesthetic and functional thresholds for all common pests
- Compile written pest profiles for all common pests
- Compile a written and installation-approved Drought Management Plan
- Compile and maintain a map of the course's hot spots

## GEM Plan best practices

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.

- None provided by the installation GEM team to date

A detailed description of each best practice should be inserted here. Please see the AFCEE GEM program website (<http://www.afcee.brooks.af.mil/ec/golf/>) for more information.



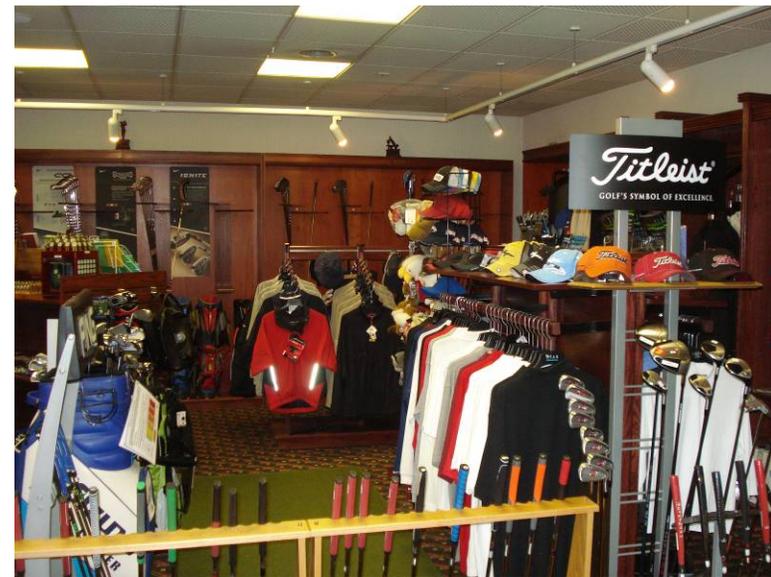
## Conclusion

The Civil Engineering Squadron's unit environmental coordinator program should provide the key oversight to assist in improving the ability of the golf and environmental staffs to work together to better support the RAF Lakenheath mission. In addition, conserving precious water supplies through the application of science, engineering, and demonstrated environmental stewardship may be the only other major issue facing the installation environmental and golf staff members.



## 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.



*Small, yet everything you need!*



*New covered wash rack helps to eliminate potential impacts.*



*The heather is a treat to the senses in East Anglia in August.*



*All-season driving range extends availability and profits.*



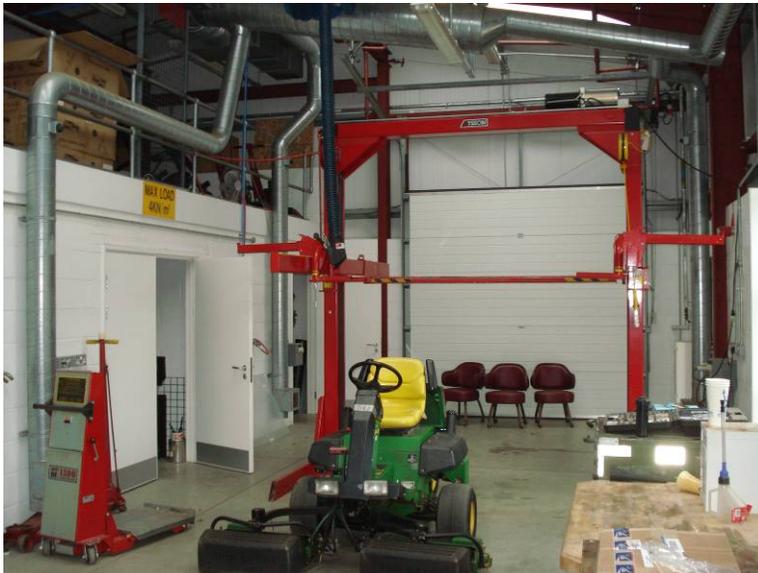
*Small greens and unique bunkering toughens the course.*



*Clubhouse is right-sized for the Breckland Pines clientele.*



*Poplar trees are short-lived and will eventually require removal.*



*State-of-the-art maintenance complex matches professionalism of staff.*



*The new 4<sup>th</sup> green will be located between these trees.*



48 CES/CEV, *48 FW Plan 32-1053, Pest Management Plan for RAF Lakenheath and RAF Feltwell*, United Kingdom, March 2007.

48<sup>th</sup> Fighter Wing, *Plan 32-7064, Draft Integrated Natural Resources Management Plan*, Aug 07.

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The Center for Resource Management, *Golf & the Environment: Charting a sustainable future*. Environmental Principles for Golf Courses in the United States, 1996, Salt Lake City, UT.

AFCEE/TDN, GEM Plan Template, accessed from AFCEE GEM website on 27 Jul 07.

48<sup>th</sup> Fighter Wing Safety Office (48 FW/SE), *48 FW Plan 91-212, Bird Aircraft Strike Hazard (Bash) Plan*, Aug 07.

48<sup>th</sup> Fighter Wing, *Plan 32-7065, Cultural Resources Management Plan*, Jun 07.

48<sup>th</sup> Fighter Wing, *Hazardous Waste Management Plan*, Nov 01.





**Air Force Center for Engineering & the Environment  
Technical Directorate  
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Please visit our Golf course Environmental Management (GEM) Program website:  
**<http://www.afcee.brooks.af.mil/ec/golf/>**