



Hubbard Golf Course
Environmental Baseline Assessment
Hill AFB, UT Jun 04





Table of Contents

Executive Summary 1
 U. S. Air Force GEM Program 1
 GEM Program process 1
 Environmental challenges 1
 Where do we go from here? 1
Introduction..... 2
 Goal of the GEM Program 2
GEM Program Process..... 3
 Analysis 4
 Documentation..... 4
 Implementation 5
 Evaluation 5
 Revision 5
Course Specific Analysis..... 6
 Course description 6
 Course details..... 7
 Hubbard Golf Course Aerial Photo, Hill AFB, UT ... 8
Miscellaneous Facility Review 9
 Clubhouse..... 9
 Maintenance complex 10
 Practice areas..... 11
 Pesticide mixing and storage 11
 Cart storage facility 12
 Infrastructure..... 12
Determining the Baseline (ECQ) 13
 ECQ Categories..... 13
 Key to checklist responses 13

ECQ Checklists 13
 Interpreting the ECQ..... 14
 ECQ Scoring Scale..... 14
 Overall Management Philosophy & Documentation
 15
 Safety, Training, & Awareness 16
 Compliance 17
 Conservation Practices..... 20
 Water Resources..... 21
 Maintenance Practices 22
 Customer Relations & Education..... 23
 Miscellaneous Special Projects & Activities..... 24
ECQ Summary 25
 GCEBA Results 25
Conclusion 26
 Observations 26
 Areas needing improvement..... 27
 The gallery..... 27
 Environmental challenges 31
Bibliography 34

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.

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 challenges

The following environmental challenges were identified during the GCEBA process:

- Installation Restoration Program (IRP)
- Proposed eastside improvements
- Cultural resources
- Bird/Wildlife Aircraft Strike Hazard (BASH)
- Regional air quality non-attainment status

Where do we go from here?

Once the environmental challenges are identified, it is paramount that the golf course staff should determine their preferred management approach in the context of their ongoing, long-term goal of providing the best golfing experience for their customer's dwindling recreation resources.

Armed with this well-conceived, golf facility-based management approach, the golf staff should then coordinate with the environmental staff to ensure that there is consistency and compatibility with installation-wide natural resource and environmental management goals and objectives.

Finally, the staff should proceed with the next steps in the GEM Program process documented in this study.

Introduction

The golf course environmental baseline assessment (GCEBA) is the initial step in the process of creating a successful ecosystem-based Golf Course Environmental Management (GEM) Plan.

The intent of the program is to provide an efficient, customer-driven management tool that will free up course managers and superintendents to devote more of their efforts to caring for their customers and the golf course. Properly designed and implemented, the GEM Plan will keep the entire golf facility in compliance with the constantly changing environmental requirements while contributing to the installation's vital recreational opportunities.



The clubhouse at Hubbard GC is the oldest facility on Hill AFB.



The 1st fairway at Hubbard Golf Course beckons.

Goal of the GEM Program

The goal of the U. S. Air Force GEM program is to facilitate the creation of an environmentally friendly golf course facility for its customers while supporting the installation mission. The Air Force Center for Environmental Excellence (AFCEE) is dedicated to helping to identify ways that more rounds can be played on better-conditioned courses while minimizing or eliminating negative impacts to the environment. In most cases, the U. S. Air Force's golf courses are being managed compatibly with the environment. The GEM program is the vehicle to document our successes while communicating directly with our customers, commanders, and local community.



The driving range is an interesting situation at Hill AFB.

GEM Program Process

Efficient implementation is the most important aspect of any initiative where practices and procedures are examined and may undergo significant change. This is especially true of the GEM Plan process. The latest requirements for the GEM Plan components are described and outlined on the AFCEE golf course environmental management program website: <http://www.afcee.brooks.af.mil/ec/golf/>. Detailed explanations and directions for completing the GEM Plan will be delineated in AFCEE's proposed handbook ***Golf and the Environment, Guidelines for the 21st Century***.

The GEM Program is derived from many diverse environmental regimes such as the National Environmental Policy Act, the Environmental Compliance Assessment and Management Program, and the ISO 14001 environmental management system. There are five basic steps in the implementation of the GEM Program process:

- Analysis
- Documentation
- Implementation
- Evaluation
- Revision



Quality at every turn epitomizes the experience at Hubbard GC.



Hill AFB's course is gently rolling with several elevation changes.

Analysis

Experienced environmental managers realize the importance of assembling all of the data relevant to a problem prior to determining its best solution. Analysis is the first and most important task of the golf course environmental baseline assessment (GCEBA) and the GCEBA is the initial step in the process of creating an ecosystem-based Golf Course Environmental Management (GEM) Plan. Properly completing the GCEBA is paramount to the long-term compatibility of an installation's golf course management practices with the GEM Program, and more importantly, the U. S. Air Force's natural resource and environmental management goals and objectives.

GCEBA COMPONENTS

The GCEBA is comprised of the following components:

- Site visit, interviews, and data collection
- Course specific analysis
- Miscellaneous facility review
- Environmental compatibility quotient checklists
- Identification of environmental management challenges
- Summary report

Documentation

It is not enough just to know how to create a successful golf course environmental management program. There must be a written record documenting existing site data, maintenance practices, pesticide applications, and other historical golf course activities. By documenting what we know, we will be able to determine how to make better decisions in the future. The completed GEM Plan will assist in the daily management of the course while providing a convenient vehicle to communicate to commanders and customers alike the environmental issues that challenge us on our golf course as well as our plans to deal with them. In order to reach the environmental stewardship goals set by the U. S. Air Force, we must consistently employ only those management practices that minimize or eliminate potential negative impacts to the environment.

GEM PLAN COMPONENTS

The GEM Plan will be comprised of the following components:

- GCEBA report
- Map of the entire golf course facility grounds depicting locations of the significant environmental management challenges and the golf course facilities
- Booklet that describes the environmental management challenges on the GEM Plan map
- Specific practices that will be employed by the golf course staff to deal with each environmental management challenge after coordination with and approval by the installation environmental staff
- Compilation of best management practices employed at the golf course in their implementation of the GEM program recommendations

Implementation

Positive and decisive action is the only true measure of the success of a GEM Program. By implementing new practices, whether to knowingly improve the course's role in the environmental stewardship of the installation or to just try new ideas to determine their value, will the golf staff and golfers benefit. The Hubbard staff should adopt the GEM Program Environmental Policy and immediately begin finding ways to minimize or eliminate any and all negative impacts to the environment.

Evaluation

In order to ensure the highest quality of customer service and environmental stewardship, there must be continual self-evaluation and improvement. There also should be consistent, on-going measurement of the reduction or elimination of environmental impacts the newly implemented practices have on the course. For example, documenting the reduced use of inputs such as fertilizers, pesticides, and irrigation can be used to demonstrate the increased environmental stewardship of the golf course management practices as well as the overall value of the GEM Program. It is important for U. S. Air Force golf courses to show improvement over time. This can be easily accomplished by regularly evaluating golf course maintenance methods, practices, and management approaches to day-to-day issues and changing when appropriate.

Revision

The very nature of a superior GEM program implies that all documents be regularly maintained to represent the most current conditions. U. S. Air Force golf course managers and superintendents should be constantly looking for ways to improve their environmental stewardship. Acting on lessons learned is right behind initial implementation as the most important aspect of a successful GEM Program. The GEM Plan should be kept as current as possible at all times. Ideally, it should be completely updated at least every three years.

Course Specific Analysis

One of the most pragmatic and enjoyable tasks in the GCEBA process is the course specific analysis. From a general overall description of the course to the details of the course's history and makeup to the various observations on the way the course plays, looks, and is managed, the course specific analysis sets the stage for the rest of the GCEBA report. It is comprised of the following tasks:

- Course description
- Course details
- Miscellaneous facilities examination



Most, if not all, of the trees have been added to the landscape.



Quality turfgrass and majestic views are regular fare.

Course description

Constructed in the early 1960s, Hubbard Golf Course is one of the youngest, old U.S. Air Force golf facilities. A regular host to important local and regional tournaments, the state amateur championship was once held at the Hill AFB facility. Characterized as almost always having great green conditions, the Director of Golf has literally had a hand in almost every detail of the operation. He has spent the last 40 years doing everything from mowing greens to planting trees to caring for senior officers and distinguished visitors. Probably the greatest testament to his legacy, as any really good manager can testify to, is the quality of the people working for and around him.



Course details

Architect	Lee Stottern
Year constructed	1961/62
Climate	High desert
Average annual rainfall	40 inches
Average growing season	Mar-Oct (180 days)
Winds/Prevailing Direction	East
Total Facility Acreage	300 acres
Par	36-36-72
Yardage/Rating/Slope	Blue- 6962/72.5/122 White- 6418/70.6/119 Red- 5367/69.7/112
Turfgrass	Perennial Rye/Merion
Tees-	Per. Rye/Kentucky Blue
Fairways-	Perennial Rye/Poa annua
Greens	Kentucky Bluegrass
Roughs-	





Hubbard Golf Course Aerial Photo, Hill AFB, UT

Miscellaneous Facility Review

Although the course is primary to the enjoyment and eventual return of most of Hubbard' customers, the support facilities play a huge role in the overall success of the operation. This section of the GCEBA will examine the following facilities for their aesthetic, functional, and environmental values:

- Clubhouse/pro shop/snack bar
- Maintenance complex
- Practice areas
- Pesticide mixing and storage
- Cart barn
- Infrastructure



The clubhouse is perched at the highest point on the property.



Wayne Volk's pro shop has everything a golfer may require.

Clubhouse

The clubhouse at Hubbard Golf Course is the oldest building on the installation. Built in 1943, Building 720 is one of 21 Hill AFB facilities that have not been assessed for potential listing in accordance with the National Historic Preservation Act. FY05 funds will be requested for this action. Meanwhile, the facility must be considered as officially "historical" although it has been through renovations over the years with the last occurring in 1999.

The two-story structure is amply sized and highly functional. The interior is reminiscent of a hunting lodge and seems to function extremely well despite its age.

Maintenance complex

The maintenance complex has recently been upgraded with a new facility. The equipment storage facility was scheduled for completion in August 2004 and will feature an impressive increase in the superintendent's ability to protect the valuable course maintenance equipment.



Still under construction during the site visit, the new maintenance complex will add much needed indoor storage space.



Existing workspace for the mechanic is barely serviceable.



Currently, most equipment is stored outdoors in the elements.

Practice areas

Hubbard Golf Course has two practice putting/chipping greens. The driving range is an interesting situation as the land is leased from private landowners. Not only does this create a financial liability for the staff, there is some doubt as to the long-term viability for the range existing next to the clubhouse. Accordingly, the director has begun development of a new driving range on available land. Unfortunately, the land is located far from what would be deemed desirable and may potentially be impacted by the proposed east side gate.



Two putting greens near the clubhouse get a lot of action.



The mixing and storage facility isn't fancy but it is compliant.

Pesticide mixing and storage

The pesticide storage facility offers the Hubbard superintendent and his staff a safe, yet barely adequate location to care for the course's pest needs. The mixing area is covered and paved though additional paving could increase the maintainability and utility of the facility.



The cart storage facility at Hubbard GC is integrated into the hillside alongside of the clubhouse.

Cart storage facility

The existing cart storage facility is located directly adjacent to the clubhouse and provides convenient access for customers. Hubbard GC uses gas-fueled carts and the refueling tank is close by.

Infrastructure

This section examines important elements of a quality golf course that are difficult to group into another category. Cart paths are in good condition. The course could benefit over the long haul if the cart paths were continuous from tee to green. The parking lot is in good condition and does not appear large enough to satisfy the regular demands of Hubbard' customers. An overflow lot some distance from the clubhouse is available. Landscape development attempts have been relatively successful and should be continued where appropriate. There is a site amenity group near most teeing areas and the course signage could be improved. The irrigation system has recently been installed at a cost of \$2M.



Concrete cart paths and landscape treatments add to experience.

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).



Halfway House is a welcome oasis during a round.

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



New maintenance facility as seen by customers from the course.



A recent course addition, this pond on the 5th is closest to the airfield.

Overall Management Philosophy & Documentation				
#	Environmental Compatibility Indicator	Yes	Partial	No
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 environmental opportunities or constraints such as water features, sensitive landscapes, threatened or endangered species habitat, special management zones, etc. used in the environmental management decision-making process and is it posted for customers?		✓	
5	Environmental goals, objectives, issues, 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?	✓		
	Point totals for each column	5	5	0

Safety, Training, & Awareness				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	All employees are familiar with the overall GEM Plan and are trained on the importance of environmental compliance with the goals and objectives of the program?			✓
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 regular, documented training on all potential OSHA issues?	✓		
7	Are all golf course pesticide applicators active participants in a local respiratory and pulmonary testing program?	✓		
8	Pesticides, fertilizers, and other chemicals are 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 and safety?	✓		
10	Are key staff members trained regarding water quality and conservation issues?	✓		
	Point totals for each column - Response percentage	9	0	1

Compliance				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Is fuel storage/delivery managed in accordance with federal, state, and local regulations?	✓		
2	Are installation environmental staff members included in on-going course management discussions and plans at scheduled meetings?	✓		
3	Do you regularly discuss environmental management issues at scheduled golf course staff meetings?	✓		
4	Does the director of golf and the superintendent attend E(SOH)CAMP 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?	✓		
	Point totals for each column - Response percentage	7	2	1

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 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 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"> - the quantity of each pesticide used - the chemical or common name of the active pesticidal ingredient(s) (not the product name) - the pest or purpose for which the pesticide was applied --the date and place of application. 	✓		
9	Is the chemical storage structure/area locked, well ventilated, fire proof, and access is limited to select personnel?	✓		
10	Are food storage and prep areas properly cleaned to reduce the likelihood of pest infestations and required pesticide applications?	✓		
	Point totals for each column - Response percentage	10	0	0

Pollution Prevention				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are there designated "no-mow" areas (other than ponds) and "no spray zones" and 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 spill containment procedures in place?	✓		
3	Does the chemical storage area have a sealed metal or concrete floor and are all 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?	✓		
	Point totals for each column - Response percentage	9	1	0

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 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 “no-mow” area maintenance practices been coordinated with the installation BASH officer and environmental management personnel?	✓		
10	Are all motorized golf course equipment checked regularly for excessive air polluting emissions?		✓	
Point totals for each column - Response percentage		7	2	1

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 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 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	If required, 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 or regulatory agencies (if required) for appropriate action?	✓		
	Point totals for each column	9	0	1

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 to include 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 procedures in place to continually improve soil health such as topdressing, organic amendments, aeration, and drainage?	✓		
5	Is there a 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?	✓		
	Point totals for each column - Response percentage	6	3	1

Customer Relations & Education				
#	Environmental Compatibility Indicator	Yes	Partial	No
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 when drinking reclaimed or otherwise non-potable water?	✓		
8	Are there interpretive signs posted to highlight key habitats or have appropriate areas 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?	✓		
	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 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 local 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?			✓
	Point totals for each column	6	1	3

ECQ Summary

#	Environmental Compatibility Quotient Category	Yes	Partial	No
1	Overall Management Philosophy & Documentation	5	5	0
2	Safety, Training, & Awareness	9	0	1
3	Compliance	7	2	1
4	Pesticide Use, Storage, & Handling	10	0	0
5	Pollution Prevention	9	1	0
6	Conservation Practices	7	2	1
7	Water Resources	9	0	1
8	Maintenance Practices	6	3	1
9	Customer Relations and Education	8	2	0
10	Miscellaneous Special Projects & Activities	6	1	3
	Composite point total/response percentage	76	16	8

GCEBA Results

Σ Hubbard Golf Course, Hill AFB, UT

- Actual ECQ (# of “Yes”) = 76 “Showing progress”

- Potential ECQ (Actual ECQ plus “Partial”) = 92 “Getting there”



Conclusion

Hubbard Golf Course is one of the U.S. Air Force's finest 18-hole facilities. Unsurpassed scenery, an interesting and diverse routing plan, finely manicured greens, and quality fairway turf make this a wonderful experience for Hill AFB golfers- truly a testament to the superintendent's dedication to the game and his profession. The Director of Golf's staff is also one of the most personable and customer-oriented in the business. All in all, Hubbard Golf Course is another example of how U.S. Air Force Services personnel really answer the call in difficult times to ensure a quality product for their customers.

Observations

- Need to compile and document actions already taken to create "continuity" document
- Utilize installation environmental management geographic information system and civil engineering digital aerial photographs for mapping requirements
- Need to secure computer hardware and software upgrades to increase overall efficiency and provide high speed internet access
- Expanded training for all employees a must to completely realize GEM goals
- Ensure employee's health is prime consideration
- Demonstrate genuine concern for player health and safety through documented and shared actions
- Consider using AFCEE for on-site golf course environmental management training
- Assemble all documents in one place
- Do more than what is required
- Ensure ECAMP results continue to be outstanding
- Increase the use of slow release fertilizers when appropriate
- Regularly provide training for all employees on the specifics of pollution prevention and how they can help
- Increase communication with customer on conservation practices that are already in place
- Continue building relationships with installation natural resources manager and other environmental professionals
- Provide detailed input to the scheduled update of installation integrated natural resources management plan (INRMP)
- Increased training and involvement of staff on integrated pest management procedures
- Compile written pest profiles of common pest species
- Increase number of trained scouts on the maintenance staff

- Create a location to communicate environmental management goals and maintenance plan in the clubhouse
- Continue to involve installation youth through rules and instruction clinics
- Conduct field trips at the course for local school children
- Enlist the assistance of local city and county officials on golf course environmental planning initiatives
- Initiate Earth Day environmental awareness golf tournament
- Educate customers about the benefits of an environmentally friendly golf course

Areas needing improvement

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

- 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.



The 4th green complex is nicely sited and designed.



New driving range may be too removed from clubhouse to add value.



Mirrors to see the landing area are required on a couple of holes.



Use of glyphosate around trees is a natural labor savor.



Attractive appointments highlight the clubhouses' upstairs room.



Irrigation pond and pump house are prominent features of the 1st hole.



Volk had a pond removed from the 14th to help with BASH efforts.



Landscape treatments are generally the right size and well maintained.



The clubhouse offers a much different view to arriving customers.



Patches of turf have been worn or eroded and need attention.



Erosion is a constant threat to new projects dealing with slopes.



Subtle and sometimes tiny, the greens are great at Hubbard GC.



Well-placed bunkers and hundreds of evergreen trees add to challenge.



Hubbard Golf Course's facility sign is not indicative of its quality.

Environmental challenges

One of the important results of the GCEBA process is the identification of significant environmental challenges to be addressed in the long-term GEM Planning process. Ideally, the golf staff will address each issue from the best way to satisfy the goals of the golf facility and acceptable levels of course playability and customer satisfaction. The golf staff's preferred management approach for these issues should then be coordinated with the installation's environmental staff for refinement, coordination, and approval.

The GEM Plan would then consist of the environmental challenges, the approach to their management, a map showing where these challenges occur on the golf course, a booklet that describes the mapped challenges, goals and objectives for future years, and a set of best management practices.

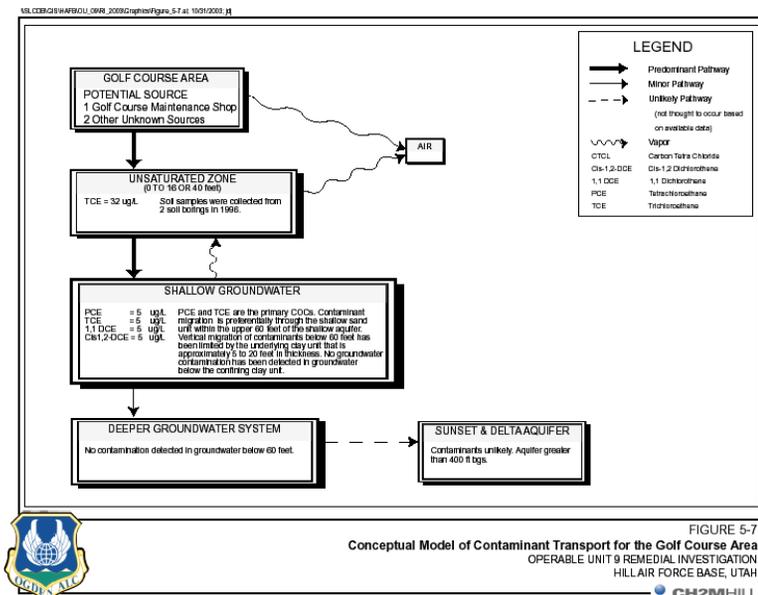
The following environmental challenges were identified during the GCEBA process at Hubbard Golf Course, Hill AFB, UT:

- Installation Restoration Program (IRP)
- Proposed eastside improvements
- Cultural resources
- Bird/Wildlife Aircraft Strike Hazard (BASH)
- Regional air quality non-attainment status



INSTALLATION RESTORATION PROGRAM (IRP)

One site, Operable Unit (OU) 9 is the only IRP site on or nearby the Hubbard Golf Course. The small site is located along the farthest southeastern point of the course near the 4th green and 5th teeing area. Groundwater contaminants have been identified as PCE and TCE believed to have originated from Building 710 as a result of golf course equipment maintenance. The golf course staff should determine if there are any prescribed actions that they should or should not take in the area by consulting with the installation environmental management staff.



Conceptual model of potential groundwater contaminant transport.

PROPOSED EASTSIDE IMPROVEMENTS

Two major projects could have significant impacts on the Hubbard Golf Course when or if they are implemented. The first and most significant is the proposed taxiway improvements and associated transient aircraft related projects as depicted in the Eastside Aerial Development Plan. The 7:1 transition surface bisects the Halfway house on the course. The primary surface line, which is 1000 linear feet from the runway centerline, cuts right through several holes along the “bottom” of the course.

There is also a proposed new gate that could affect the newly established driving range property that was formerly a base housing area. This potential project is not nearly as significant but its implementation may affect long-term plans for the golf course facility.



The primary surface boundary passes through the 5th green.



The clubhouse at Hill AFB dates from 1943.

CULTURAL RESOURCES

The clubhouse is the only potential cultural resource issue at the Hubbard Golf Course. The facility is scheduled for review under the National Historic Preservation Act in 2005. Depending on the results of the study, maintenance and remodeling activities of the facility could be prescribed rather than the golf course staff's discretion.

BIRD/WILDLIFE AIRCRAFT STRIKE HAZARD (BASH)

Situated alongside the runway at Hill AFB where they fly F-16s, the Hubbard Golf Course is subject to regular scrutiny. The installation's commitment to eliminating strike hazards is one of its primary mission support functions. Potential concerns to aircraft

safety from the golf course will be a result of poor communication. The golf staff must coordinate any and all activities that affect this issue directly with the base flying safety office BASH experts. U. S. Air Force golf courses must never be connected in any way to BASH related aircraft or flying crew damage or losses. The Integrated Natural Resources Management Plan states that there are approximately 12 recorded strikes a year. The golf course's recent addition of a pond on the 5th hole demonstrates the proper construction methodology to minimize the potential growth of emergent vegetation and the resulting waterfowl immigration.

REGIONAL AIR QUALITY NON-ATTAINMENT STATUS

According to their website, Hill AFB is dedicated to performing its operations in an environmentally sensitive manner. Air quality continues to be one of the key areas targeted for improvement. The volatile organic compound (VOC) emission reduction program supports not only the country's goal for compliance with the National Ambient Air Quality Standards (NAAQSs) for ozone, but also betterment of quality of life for our community. The golf course is in Davis County that has been designated as in maintenance for ozone. VOCs are one of the precursors for ozone. One of the ways Hill AFB plans to accomplish this goal is through implementation of their VOC reduction initiatives. VOCs react with sunlight to create smog, and many are considered by the EPA to be hazardous air pollutants (HAPs). HAPs are regulated due to their proven or suspected impact on human health. Hill AFB has reduced photo-chemically

reactive emissions by 174 tons annually. Emission reductions have been realized through a combination of material substitutions, process changes, and emission control technologies. One emission control device actually recycles VOC air emissions.

The golf course staff should be aware of these initiatives and do their part by ensuring that all equipment is maintained to run efficiently with minimal emissions. New equipment should only be purchased after consideration of its potential to add to the ozone problems at Hill AFB and its surrounding air region of Davis County. Through efficient use of available public funding and Hill AFB personnel resources, as well as through partnerships with local organizations and universities, Hill AFB is contributing to the improvement of air quality in Utah.

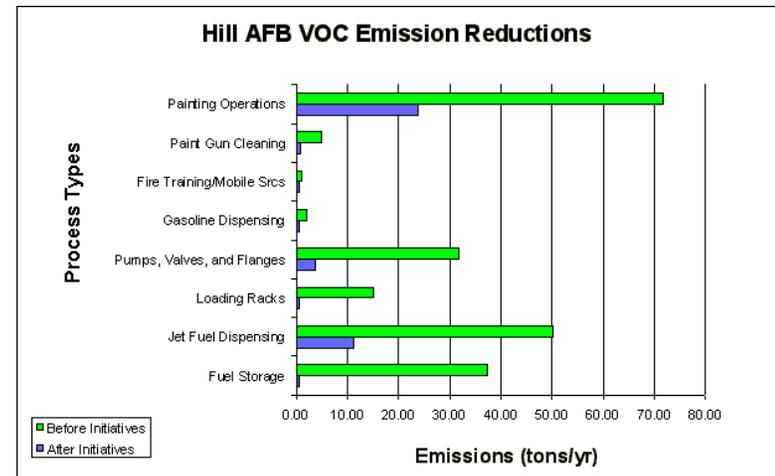


Chart from the OO-ALC/EM website demonstrates the phenomenal improvements resulting from Hill's VOC reduction initiatives.



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