

# Presidio Golf Course IPM Program Environmental Assessment

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## ENVIRONMENTAL ASSESSMENT

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### **Lead Agency**

The Presidio Trust

### **Action**

Implementation of the proposed Presidio Golf Course Integrated Pest Management Program.

### **Abstract**

The Presidio Trust (Trust) has prepared this Environmental Assessment (EA) evaluating the environmental effects of the proposed Presidio Golf Course Integrated Pest Management (IPM) Program (IPM Program or Proposed Action) and No Action Alternative. The IPM Program utilizes an ecosystem-based strategy of pest management that relies on a combination of non-chemical and chemical techniques to reduce the use of pesticides. The Arnold Palmer Golf Management (APGM) (project proponent) would be responsible for implementing the IPM Program.

### **Comments**

The public review period for this EA ends on August 7<sup>th</sup>, 2002. Please send comments to:

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At the close of the public review period, the Presidio Trust will consider and respond to substantive comments. Responses to these comments and any changes to the document will form the complete and final EA on which a Finding of No Significant Impact (FONSI) or decision to prepare an Environmental Impact Statement (EIS) would be based.

### **Materials Available to the Public**

Copies of the EA are available by calling or writing the Presidio Trust, 34 Graham Street, PO Box 29052, San Francisco, CA 94129-0052. Telephone: 415/561-5414. The full text of the EA is also posted on the Presidio Trust's website: [www.presidiotrust.gov](http://www.presidiotrust.gov).

### **For Further Information Contact**

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*Dated: July 8<sup>th</sup>, 2002*



## **A. Introduction & Background**

### **Presidio Trust**

The Trust is a federal government corporation created in 1996 to preserve and enhance the Presidio of San Francisco, a national park site. The Trust manages the interior 80 percent of park lands (Area B), while the National Park Service (NPS) maintains jurisdiction over coastal areas (Area A). The Trust's mission is to preserve the park's natural landscape and environment, protect and enhance the Presidio's historic resources, and, with the NPS and partners, welcome visitors with educational, cultural and recreational activities. As mandated by federal law, by 2013 the Trust must support the preservation and enhancement of the park and its operations without federal appropriations. In order to raise funds to care for the park, the Trust is transforming the homes and non-residential buildings in the 1,168-acre portion of the former military post into a new kind of community where people live, work, and can enjoy the park's resources. Six presidential appointees and the Secretary of the Interior's designee serve on the Presidio Trust's Board of Directors.

### **Presidio Golf Course**

The Presidio Golf Course was originally established in 1895 with five sand greens and four grass greens. Through the early 1900s, the Army used the Presidio Golf Course not only as a golf facility but also for occasional military trainings, drills, troop review, troop inspection, and as a temporary refugee camp in 1906 for those left homeless by the great earthquake. In 1910, the course was expanded to eighteen holes on 145-acres. In the late 1960s and early 1970s, the course was remodeled into its current configuration. The Presidio Golf Course is considered a high-profile golf course with play averaging approximately seventy-five thousand rounds per year, bringing tens of thousands of visitors to the park. The course is a contributing feature to the Presidio's status as a National Historic Landmark District (NHL district).

### **Arnold Palmer Golf Management (APGM)**

APGM was founded in 1984, and in its 18-year history has provided golf course management and instruction services to more than 30 properties in the United States and Europe. In 1995, the NPS awarded APGM the Presidio Golf Course concession contract. When jurisdiction over the interior of the Presidio (including the golf course) was transferred to the Trust in 1998, the APGM concession contract was also transferred to the Trust.

## **B. Purpose and Need**

### **Purpose of the Proposed Action**

The purpose of the proposed action is to provide a comprehensive approach to pest management for the Presidio Golf Course facilities that is effective, practicable, environmentally safe and limits the use of chemical controls. Integrated Pest Management (IPM) is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant plant varieties.



Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment.

### **Need for the Proposed Action**

The need for integrated pest management was originally identified in the final General Management Plan Amendment (GMPA)<sup>1</sup>, the NPS' plan for the Presidio, and subsequently in the proposed final Presidio Trust Management Plan<sup>2</sup>, which updates and succeeds the GMPA as it applies to Area B. Preparation of an IPM Program is also a requirement in APGM's concession contract for the golf course. APGM initially submitted a Chemical Application Management Plan (CHAMP), which addressed turf management and pest management on the course. The CHAMP was not approved by NPS or the Trust due to lack of pest-specific guidelines for non-chemical and preventative pest management. Subsequently, the Trust, APGM and the NPS worked cooperatively to develop goals, objectives, and guidelines to aid in the development of a mutually agreeable IPM Program. The CHAMP was revised to emphasize non-chemical pest management and reduce the number of pesticides that could be used. The revised program is this IPM Program, and is the subject of and incorporated by reference into this EA. Copies of the IPM Program are also available for review in the Presidio Trust Library.

Currently, APGM makes individual pesticide application requests to the Trust. The requests are approved or denied on a case-by-case basis creating the potential for inconsistent decisions and harmful delays. Since golf course pests such as turf diseases can progress rapidly, a quick decision is often necessary to prevent irreparable damage. When implemented, the IPM Program would establish a comprehensive approach to pest management that emphasizes non-chemical (e.g., cultural and mechanical) actions over the use of pesticides to minimize environmental impacts. Under the IPM Program, pesticides would be used only in instances where non-chemical methods have proven insufficient or not feasible, and only those pesticides that have been determined to be of low risk to people and natural resources would be used. The IPM Program would provide clarity about golf course pest management practices, appropriate activities, protocols, and permitted materials, and outline the areas and circumstances in which they may be applied. It would also ensure continuity in IPM Program management in the event of APGM personnel changes at the golf course.

### **Purpose of the EA**

According to the Council on Environmental Quality (CEQ) NEPA Regulations, an EA is a concise public document prepared by a federal agency when a proposed action is not covered by a categorical exclusion or otherwise exempt from NEPA. The Trust uses EAs when it has

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<sup>1</sup> "Operation of the [Presidio Golf] course would demonstrate environmentally sound management. Use of herbicides, pesticides, and fertilizers would be minimized" (final GMPA, page 95).

<sup>2</sup> "Pests that jeopardize facilities and human health would be controlled using effective, practicable, and environmentally safe methods. Integrated Pest Management (IPM) techniques have already been developed for general pests at the Presidio, and similar practices would be incorporated into the Presidio Golf Course IPM Program" (final PTMP, page 17).



insufficient information on which to determine whether a proposed action has the potential to cause significant environmental effects (36 CFR 1010.10). The purposes of an EA are to provide evidence and analysis to determine whether an EIS is required; aid a federal agency's compliance with NEPA when no EIS is necessary, and facilitate preparation of an EIS when one is necessary (40 CFR 1508.9(a)).

### **C. Proposed Action and No-Action Alternative**

#### **Presidio Golf Course IPM Program (Proposed Action)**

Under the Proposed Action, a system of controlling pests in which pests are identified, action thresholds are followed, all possible control options are evaluated and selected controls are implemented, would be established. Control options, which include biological, chemical, cultural, manual and mechanical methods would be used to prevent or remedy unacceptable pest activity or damage. The choice of control options would be based on: effectiveness; environmental impact; site characteristics; worker/public health and safety; and economics. Pesticides (i.e. chemical controls, including herbicides, fungicides, and insecticides) would only be used based on need, and there would be a preference for low-risk (i.e. to human health and the environment) pesticides. Need would be determined by including in the treatment protocols only the specific pests that have occurred in the past, or are likely to occur in the future on the course. If needed, approved pesticides would be used: 1) after non-chemical controls have proven ineffective or unfeasible, 2) according to established guidelines, and 3) when a pest level is reached that threatens an economic impact. Pesticides would be applied under restrictions to protect groundwater, surface water, park users, wildlife, and sensitive vegetation. Best Management Practices<sup>3</sup> (BMPs) would be incorporated and protocols developed for monitoring, reporting and minimizing the effects of pest management practices on the surrounding environment.

Because IPM is an evolving science, the IPM Program would be updated and improved as new pest threats are identified, or new technologies and practices become available. To accommodate potential future changes in the program, procedures would be followed for the continued evaluation of proposed new pest control techniques and technologies. Future changes in the IPM Program would be subject to additional environmental review as necessary. Refer to Chapter 15 of the IPM Program for further detail.

The Proposed Action represents a multi-year collaborative effort among the Trust, APGM, and the NPS to revise the previously proposed CHAMP. This revision includes non-chemical control measures for each pest, action thresholds (the level of pest damage at which control is warranted), increased vegetated buffer zones in which no pesticides will be applied, and increased stormwater and subsurface water sampling sites and frequencies. All pesticides that are known human carcinogens or reproductive toxins<sup>4</sup>, highly toxic to birds or mammals<sup>5</sup>,

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<sup>3</sup> Structural mechanisms or managerial practices used to protect water quality through removal, filtration, detention or rerouting potential pollutants from the golf course before they enter surface or ground waters.

<sup>4</sup> CA Proposition 65 list of known human carcinogens and reproductive toxins.

<sup>5</sup> As documented by the individual pesticide Label, MSDS, Exttoxnet, or USDA Pesticide Fact Sheet.



cholinesterase inhibitors (nerve poisons), or known potential groundwater contaminants<sup>6</sup> were eliminated from the program. Some of these were replaced with lower-risk or biologically based pesticides, and the pesticide list was reduced from twenty-eight to thirteen. Of the thirteen identified in the IPM Program, four are biologically-based pesticides such as corn gluten meal and diatomaceous earth. An independent turfgrass expert, Ali Harivandi Ph.D., also reviewed and participated in the refinement of the IPM Program.

### **No Action Alternative**

Under the No Action Alternative, there would be no comprehensive or coordinated approach to golf course pest management. APGM and the Trust would continue to negotiate pest management options, including pesticide use, on a case-by-case basis. There would be no pre-existing IPM Program and no requirement to consider appropriate preventative and non-chemical pest management prior to the use of pesticides, and no means of requiring regular monitoring of Presidio resources (such as soil and water) for potential impacts. All pesticides could be considered in any circumstance where pest management was needed, and there would be no pre-screened list of low-impact pesticides preferable over other available pesticides. The Trust and APGM would have no procedure for addressing emergencies (such as fast-moving outbreaks of turf disease) or minimizing application volume.

### **D. Alternatives Considered but Rejected**

The following alternatives have been considered but rejected as outside the reasonable range for the reasons stated.

#### **Conventional Golf Course Pest Management Alternative**

The CHAMP originally proposed by APGM, which listed twenty-eight pesticides as appropriate for use on the course, is considered a conventional golf course pest management program. The CHAMP listed five pesticides that are known human carcinogens, four pesticides that are reproductive toxins, two pesticides classified by the CA Department of Pesticide Regulation as ‘Restricted Use’ (i.e. chemicals with the a relatively high degree of potential human and/or environmental hazard even when used according to label directions), two cholinesterase inhibitors (nerve poisons), and nine pesticides with a moderate or high potential to contaminate groundwater based on their chemical properties. All of these pesticides were deemed high-risk for use at Presidio Golf Course, and not appropriate for inclusion on the approved pesticide list.

Further, the CHAMP simply listed potential golf course pests and general management strategies for each general group of pests. It did not list information on individual pest biology, or conditions that favor individual pests. It did not contain comprehensive pest-specific non-chemical management methods, or action thresholds. It did not require sampling of subsurface water to monitor potential environmental impacts. These are all components that should be included in an IPM program. This alternative is therefore considered outside the reasonable range for use in the Presidio.

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<sup>6</sup> California Code of Regulations Title 3. Division 6. Chapter 4. Subchapter 1. Article 1. 6800.

### **Reduced Pesticide List Alternative**

Under the Reduced Pesticide List Alternative, the IPM Program would include only one pesticide approved for each pest. The difference between this alternative and the Proposed Action would be a reduction in the number of approved pesticides. This alternative was considered but rejected because it would not necessarily lead to a reduction in the number of pesticide applications per year. It would simply be a restriction on the spectrum of approved pesticides. This would lead to repeated use of one pesticide on a pest population, which could lead to that pest becoming resistant to the single approved pesticide. Turf diseases, particularly fungal and bacterial pathogens can easily develop pesticide resistance. When resistance is developed, the pesticide becomes ineffective, and is no longer a viable control option. It is preferable to identify multiple non-chemical and chemical control actions, using pesticides that are of a low-risk to people and the environment. This approach allows APGM to rotate the use, so that each time a pesticide use is justified, application of the pesticide would be effective.

### **No Pesticide Use Alternative**

Under the No Pesticide Use Alternative, the pesticides identified in the IPM Program would be prohibited from use, but all of the non-chemical IPM actions would be implemented. When non-chemical controls prove ineffective, the course managers and the public would be forced to accept any damage done to the course by pests such as fungus, weeds, insects, or soil pathogens, and accept any business loss or loss in recreational value resulting from poor playing conditions. This alternative was considered and rejected because, while non-chemical pest control methods available to turf managers would be effective under many circumstances, they could not be relied on to guarantee in all instances adequate control for all pests. Based on past management experience at Presidio Golf Course, this alternative would result in APGM being foreclosed in some instances from maintaining the greens and the rest of the course at current aesthetic and economic levels. The cost of renovation of damaged turf sites as compared to the costs of chemical treatment would be prohibitive. In addition, while the notion of a “pesticide-free” golf course is a theoretical possibility, no such course that provides a comparable level of quality of golf play has ever been established or exists to date to the Trust’s knowledge. This alternative is therefore considered impracticable and technically infeasible.

## **E. Environmental Analysis**

The analysis that follows uses the Trust’s Environmental Screening Form or checklist to assess the potential environmental impacts of the project alternatives. Conclusions within the checklist are supported or explained in accompanying text, and are based on analysis by qualified Trust staff. The analysis makes use of existing technical reports, professional judgement, and consultation with persons with expertise, including staff at the National Park Service. (See section F, Persons and Agencies Consulted.) Where items in the checklist are checked “no” without discussion, these environmental topics would be unaffected by the Proposed Action or the No Action Alternative.



**E N V I R O N M E N T A L   A S S E S S M E N T**

DOES THE PROPOSED ACTION OR NO ACTION ALTERNATIVE HAVE THE POTENTIAL TO:	Yes/No
<p>1. Destroy, remove or result in the gradual deterioration of historic fabric, terrain or setting; or</p> <p>2. Alter historic ground cover or vegetation; or</p> <p>3. Introduce non-historic elements (visible, audible or atmospheric) into a historic setting, structure or environment; or</p> <p>4. Reintroduce historic elements in a historic setting or environment?</p> <p><b>Discussion:</b> Neither alternative would physically alter character-determining features of the historic Presidio Golf Course, or introduce noticeable non-historic elements. Conducting non-ground disturbing elements of the IPM Program for control of pests such as insects and rodents is considered an undertaking belonging to “Category A.1” (Repetitive or Low Impact Activities) within the scope of the Trust’s Programmatic Agreement (PA) with the National Park Service, Advisory Council on Historic Preservation, and the California State Historic Preservation Officer. As such, this undertaking would not affect historic properties and would be exempt from further review or consultation under the terms of the PA.</p>	<p>No</p>
<p>5. Experience extensive damage due to geologic hazards; or</p> <p>6. Disturb the ground surface or change the surface topography; or</p> <p>7. Change the pattern of surface water flow; or</p> <p>8. Compromise slope stability?</p> <p><b>Discussion:</b> Under the Proposed Action, the course would be irrigated as infrequently as possible and with as long a cycle period as possible to achieve deep infiltration to prevent surface runoff. Soils on the course generally have moderate permeability. Ground cover is adequate to prevent surface water runoff and erosion. Approximately 95 percent of the course is covered with either cultivated turf or natural vegetation, and less than one acre of the course is paved. This high percentage of vegetated surface area disperses runoff water energy, promoting infiltration, and reducing surface water-induced erosion. In addition, adequate drainage and healthy turf that stabilizes the soil would control erosion. With the implementation of the Proposed Action, yearly soil-fertility testing would be conducted to evaluate what is needed to maintain healthy turf and adequate drainage of water. Based on results of testing, soil amendments would be added to the soil to correct deficiencies or imbalances.</p>	<p>No</p>



DOES THE PROPOSED ACTION OR NO ACTION ALTERNATIVE HAVE THE POTENTIAL TO:	Yes/No
<p>9. Degrade surface or ground water quality?</p> <p><b>Discussion:</b> No pesticides classified by California Department of Pesticide Regulation (CA DPR) as known groundwater contaminants, or as having the potential to contaminate groundwater based on chemical properties (CA Code of Regulations 2001a and 2001b) would be included in the IPM Program. To ensure that none of the pesticides included in the IPM Program impact groundwater, the program includes a Relative Aquifer Vulnerability Evaluation (RAVE) calculation (USDA Forest Service, 1992). A RAVE would categorize the risk each individual application would pose to groundwater as low moderate or high, taking into account not only chemical properties, but also depth to groundwater, soil texture, percent organic matter in the soil, topographic position, distance to surface water, pesticide application frequency, and annual precipitation. Most of these factors would vary based on the area in which an application would occur. A RAVE score would be calculated for each potential pesticide application, and no applications that pose greater than a low risk to groundwater would occur. In addition, BMPs would control the generation or delivery of pollutants from the golf course to water resources and prevent impacts to the physical and biological integrity of surface and ground water, thus reducing the potential for public or employee exposure. Stormwater samples covering the three drainage basins on the course would be taken during the first major storm event each year to verify that surface water is not being degraded. Subsurface drainage flow would be monitored after any pesticide application, and if flow does occur, samples would be taken to verify that groundwater is not being degraded. If samples test positive for pesticide presence, use will immediately be suspended. Consultation will occur with relevant agencies to assess risk mitigation options, and use will be reinstated only if mitigation measures are identified that would eliminate risk to human, wildlife or plant health.</p> <p>Under the No Action Alternative, all pesticide use requests would be reviewed and any pesticide proposals that have the potential to degrade surface or groundwater quality would be denied. However, no requirements for preventative management or non-chemical pest management would be enforced. Consequently, the use of chemical pest management could increase. Furthermore, no regular surface or subsoil water sampling to establish records of water quality would be required or undertaken.</p>	No



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DOES THE PROPOSED ACTION OR NO ACTION ALTERNATIVE HAVE THE POTENTIAL TO:	Yes/No
<p>10. Conflict with relevant policies and plans?</p> <p><b>Discussion:</b> The Presidio Golf Course IPM Program (Proposed Action) would be consistent with the final GMPA and proposed final PTMP (see footnotes 1 and 2) and the adopted Vegetation Management Plan and EA.<sup>7</sup> Implementation of the No Action Alternative would be inconsistent with the final GMPA, the proposed final PTMP, and the adopted VMP and EA.</p>	Yes <sup>8</sup>
<p>11. Conflict with adjacent uses either private or public; or</p> <p>12. Increase vehicle emissions or emissions of other air pollutants; or</p> <p>13. Generate nuisance dust or odors?</p> <p><b>Discussion:</b> Pesticide label drift and weather restrictions included in the Proposed Action’s BMPs would be followed to prevent damage or contamination from any drift.<sup>9</sup> In addition, buffer zones (i.e., areas in which no pesticides would be applied) would be maintained to keep pesticides from reaching off-site areas. Buffer zones would be at least 50 feet wide between the course and surrounding residences and Mountain Lake. Under the No Action Alternative, spray restrictions or buffer zones would be established only according to product specifications and product labels and material safety data sheets.</p>	No
14. Adversely impact current or planned visitor services, access or available parking?	No
15. Perceptibly increase the background noise levels or expose people to loud noise?	No
16. Increase traffic congestion, traffic volumes or adversely affect traffic safety for vehicles, pedestrians or bicyclists?	No
17. Impede accessibility?	No

<sup>7</sup> “Minimize use of chemical fertilizers, pesticides, and herbicides by maximizing the use of natural processes that provide these functions such as integrated pest management, composting, and mulching” (VMP and EA, p. 64).

<sup>8</sup> No Action Alternative only.

<sup>9</sup> The CA Department of Pesticide Regulation defines drift as “pesticide that moves through the air and is not deposited on the target area at the time of application.”



<p>18. Substantially increase the amount of energy or water used or waste generated?</p>	<p>No</p>
<p><b>Discussion:</b> Irrigation water usage under both alternatives is expected to range from as low as 0.01 acre-feet per month in the winter, to 30 acre-feet per month during hot windy periods in the summer. Irrigation management practices within the IPM Program would promote water conservation and minimize infiltration and surface or subsurface flow. Different areas of the course would be irrigated according to individual need rather than all at the same rate. Irrigation nozzles would be checked regularly for proper sprinkler rotation, proper angle, and proper flow. Evapotranspiration (ET<sub>o</sub>) would also be calculated to give an approximation of how much water the turf uses each day. In addition to ET<sub>o</sub> measurements, turf appearance, wear, compaction, and professional and published irrigation guidelines would be used to adjust the amount and rate of irrigation to limit water use or flows.</p>	
<p>19. Maintain or create a public or employee safety or health hazard; or</p>	<p>Yes</p>
<p>20. Involve handling/storage of hazardous substances?</p>	



**Discussion:** All pesticide use and storage would be done in accordance with the manufacture’s use directions, including the use of personal protective equipment during use, and restrictions on re-entry into treated areas. All hazardous waste activities would be conducted in accordance with the Presidio Hazardous Waste/Materials Management Standard Operating Procedure (Presidio Trust 1999) and all applicable federal, state and local laws and regulations. All hazardous waste activities would be monitored by the Trust.

APGM stores pesticides in a pre-fabricated and self-contained storage unit located adjacent to the maintenance facility. The locker is specifically designed for compliance with applicable regulations and safety standards (CFR Title 40, Part 170 and CFR Title 29, Part 1910). The unit is locked and only the superintendent and his/her assistant have keys. The locker is subject to yearly inspection by the Trust and the San Francisco County Agricultural Commissioner’s Office. Materials would be purchased on an as-needed basis and used as soon as feasible to reduce the need for and duration of storage. Thus APGM would not store large quantities of chemicals on the course. Due to varying weather conditions and turf disease pressures it is impossible to accurately predict the exact number of pesticides that would be stored at any given time, but it is likely to be less than five individual pesticides, and less than twenty gallons or pounds of each, all of which would be of relatively low toxicity as discussed in section C of this EA.

Chemical pesticide selection guidelines set forth in the IPM Program would be applied for use in the event that a new pest situation occurs on the course. These guidelines require that toxicity and potential risk, impact to non-target organisms and environmental fate be addressed when selecting a pesticide for a proposed use. The use of any pesticides not identified in the IPM Program would be subject to additional environmental review.

21. Block or substantially alter an existing view, be visually intrusive or contribute to a degraded visual condition?	No
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**Discussion:** Regular implementation of cultural, mechanical, and biological pest control would promote healthy, vigorous turf and give it greater aesthetic appeal.

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| 22. Affect rare, endangered or sensitive species; or                   |  |
| 23. Adversely affect wildlife (feeding, nests, dens, roosts, etc.); or |  |
| 24. Affect wetland, riparian or coastal habitat; or                    |  |



25. Expose pesticides to fish?

No

**Discussion:** The IPM Program would aid in the protection of biological resources due to turf maintenance practices. The general distribution and abundance of natural resources on the course are described in the IPM Program, and specific guidelines on pest control restrictions related to the protection of biological resources are provided, including the following:

- vegetated buffer zones (i.e., areas in which no pesticides would be applied) would be maintained at least 50 feet wide between the course and Mountain Lake, the Rare Plant Area (i.e., supporting San Francisco *Lessingia* populations) adjacent to the 13<sup>th</sup> fairway, the seasonal stream that occurs to the northeast of the 2<sup>nd</sup> fairway, and other native plant community habitats occurring on or near the course;
- maintenance of several low-lying and other sensitive areas (such as the southern border of the course adjacent to Mountain Lake and the areas to the left of the 4<sup>th</sup> hole and to the left of the 2<sup>nd</sup> hole) as natural areas in order to provide improved infiltration of surface water;
- restrictions on pesticides, limits on irrigation, fencing and signage along the 13<sup>th</sup> fairway/approach to protect the Rare Plant Area;
- restrictions on tree and brush pruning, and prohibition of the use of pesticides in tree crowns that provide wildlife habitat;
- spray weather restrictions to prohibit pesticide use during unfavorable weather, and to keep pesticides from entering groundwater or surface water;
- routine sampling of stormwater and subsurface water to confirm that pesticides are not impacting Presidio water resources and wildlife; and
- suspension of pesticide use if pesticide detections occur in stormwater or subsurface water samples, consultation with relevant agencies to assess risk mitigation options, and reinstatement of use only if mitigation measures are identified that would eliminate risk to human, wildlife or plant health.

In addition, a separate habitat and wildlife management protocol is currently being developed by the Presidio Trust and APMG to address management and enhancement of natural resources as well as the control of invasive exotic species in the natural areas on the course.



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Under the No Action Alternative, BMPs and measures (including buffer zones and pesticide restrictions) would be developed under the habitat and wildlife management protocol currently under preparation to protect rare, endangered or sensitive species from disturbances	
26. Add or remove plants?	Yes
<b>Discussion:</b> Maintenance of the golf course under either alternative would include small-scale turf renovations and the suppression or eradication of invasive non-native weed species in the turf and landscaped areas of the course. Weeds would be managed through a combination of hand weeding, mulching, and the use of herbicides when warranted. These activities would have an overall beneficial effect on the course vegetation and turf.	
27. Attract animal or insect pests?	No
<b>Discussion:</b> Prevention of pests or their damage is the purpose of the IPM Program.	
28. Increase demand for police services or create an attractive nuisance?	No
29. Increase demand for fire protection services or increase wild fire hazard?	No
30. Increase night lighting or glare?	No



31. Result in cumulative impacts?

Yes

**Discussion:** The combined, incremental effects of the IPM Program, when added to other past, present and foreseeable future actions within the Presidio, would be a benefit to the environment. These actions include projects implementing the Presidio Vegetation Management Plan, the Mountain Lake Enhancement Plan, the Draft Recovery Plan for Coastal Plants of the Northern San Francisco Peninsula, the Crissy Field Plan and Marsh Expansion Technical Study Memorandum of Agreement, the Tennessee Hollow Restoration Project, and the Presidio Golf Course habitat and wildlife management protocol.

Taken together, these actions would:

- protect and enhance existing native plant communities and their remaining habitats within the context of a heavily urbanized city where most of these habitats have been altered or destroyed;
- promote population increases of target species within these habitats and reintroduce target species to restored habitats;
- remove (locally eradicate) or suppress invasive, nonnative vegetation within and around native plant habitats and reestablish native communities compatible with endangered species within habitats; and
- protect ground and surface water, natural wetland and riparian habitat, and water supplies for the Presidio community.

**F. Persons and Agencies Consulted during Preparation of this EA**

The following persons were consulted in the preparation of this document:

- Bruce Badzik, NPS IPM Coordinator (re: pesticides approved by NPS for use in GGNRA)
- Terry Cacek, NPS Western Regional IPM Coordinator (re: NPS IPM Program revision requirements)
- Darren Fong, NPS Wildlife Biologist (re: potential impacts to aquatic wildlife)
- Ali Harivandi, Ph.D., Turfgrass Specialist (re: peer review and incorporation of comments into the IPM Program)
- Daphne Hatch, NPS Wildlife Biologist (re: potential impacts to wildlife)
- Josh Heersink, Arnold Palmer Golf Management, Presidio Golf Course Superintendent (re: golf course maintenance and monitoring)



- Tamara Williams, NPS Hydrologist (re: groundwater and surface water monitoring)

In addition, the Trust solicited early public input on the content and scope of this EA through public scoping. As part of the scoping process, request for early consultation letters were sent to the following agencies:

- California Coastal Commission
- Caltrans, District 4
- Department of Fish and Game, Region 3
- Department of Food and Agriculture
- Department of Parks and Recreation
- Department of Toxic Substances Control
- National Park Service, Golden Gate National Recreation Area
- National Park Service, National IPM Coordinators
- Native American Heritage Commission
- Office of Historic Preservation
- Regional Water Quality Control Board, Region 2
- Resources Agency
- San Francisco Bay Conservation and Development Commission
- State Lands Commission
- State Water Resources Control Board, Clean Water Program
- University of California Cooperative Extension, San Francisco County

The Trust also published an article on the proposed action in the Trust's October 2001 issue of its monthly newsletter, the Presidio Post. Issues raised through public scoping and responses are provided below.

1. Address water quality and cumulative effects.

**Response:** These impacts have been addressed in the IPM Program and this EA. Please refer to sections E-9 and E-31 in the EA and Section 12.4 through 12.6 in the IPM Program.

2. Include a reduced pesticide alternative.

**Response:** It was suggested that at least five of the herbicides and four fungicides that were included in the initial draft IPM Program are on the US Geological Survey (USGS) National



Water Quality Assessment Pesticide National Synthesis Project list of pesticides that have been found to contaminate groundwater beneath golf courses, and that these should be removed to form a reduced risk alternative. In response to this suggestion, all pesticides that have been documented as having been found in groundwater beneath golf courses (Barbash 1998) were removed from the IPM Program.

3. Select IPM strategies based on protection of the environment; effectiveness and economics should be secondary.

**Response:** This guidance was taken into consideration in the development and subsequent refinement of the IPM Program. The Program is designed to minimize the use of chemical controls, and practices, protocols and protections are specified to promote protection of the environment.

4. Explain the process for determining whether it is possible to use non-chemical pest management practices and when use of pesticides is unavoidable.

**Response:** Each pest covered in the IPM Program has a corresponding management table that lists the various control methods to be used on that pest. Each control method for each pest has an “action threshold” which is the level of pest infestation at which the control measure would be implemented. The individual action thresholds are included in each management table within the Program. The action thresholds for pesticide use are higher than the action thresholds for non-chemical controls. Thus, a pesticide would be used only after non-chemical methods have proven ineffective and the pest level has met or exceeded the action threshold for pesticide use.

5. Specify the frequency of updates of the IPM Program.

**Response:** The IPM Program would be updated on an as-needed basis (which would likely be every two years), and at a minimum the pesticide list would be reviewed once every four years. While NPS policies generally do not apply to Area B, the four-year minimum review schedule would conform with an NPS policy to grant approval for a four-year period to pesticide use covered in IPM programs within national parks (Cacek 2001).

6. Specify the pesticide formulation, method of application, frequency of application, and amount of active ingredient per year.

**Response:** The IPM Program includes the pesticide label of every pesticide listed in the program. The label is the document that states the legally approved formulation, acceptable methods of application, rate of application/amount of active ingredient in one application, and any limitations on the number of applications allowable per year. Varying pest pressure along with varying success of the non-chemical controls would determine the frequency of application, and amount of active ingredient per year. The IPM Program would reduce the number of applications to the very minimum, but it is impossible to predict what that minimum would be in any given year. In general, it is unlikely that any of the fungicides listed in the IPM Program would be used more than one time per year, any of the herbicides would be used more than four times per year, or any of the insecticides would be used more



than one time per year. However, unpredictable weather and pest infestations make it impossible to make accurate pesticide use predictions.

7. Increase the number of stormwater monitoring locations to ensure sufficient coverage to evaluate impacts on groundwater, stormwater runoff, surface water quality, air quality, public health as related to risk of exposure, sensitive biological resources and soils.

**Response:** In response to the suggestion, the IPM Program was revised to increase the number of sampling sites from four to six. In consultation with NPS Natural Resource staff, the six stormwater sampling sites were identified at the downstream edges of the three drainage-flow basins which occur on the course. Additionally, ten subsurface water monitoring sites were identified, which cover all soil types, lowest elevations, and closest proximity to water resources for each turf management zone. Subsurface water would be monitored after each pesticide application and a sample taken if flow occurs.

8. Describe the decision-making criteria for rotation of pesticides or for use of a more toxic chemical.

**Response:** Resistance management is an important concept in IPM. When the same pesticide is used repeatedly because it is the lowest toxicity option, it is likely that the pest population would develop a resistance to the pesticide. The pesticide would therefore need to be used more often and at a higher rate than before, until finally the pesticide may become ineffective. At that point, the pesticide is no longer a viable control option. It is preferable to identify more than one, and ideally more than two, pesticides that are of a low-risk to the environment, and rotate the use of them, so that each time a pesticide use is justified, the pesticide would be effective. All of the pesticides listed in the IPM Program were chosen because they can all be used without presenting a high risk to people or the environment. However, within the gradient of low-risk pesticides, some pose more risk than others as reflected in the management table for each pest. Best professional judgment will be used to apply the IPM rotation principles so as to minimize pest resistance.

9. Incorporate into the IPM Program an ongoing series of drainage improvements that would minimize growth or pest problems.

Drainage improvements are ongoing at the golf course. These improvements better the quality of the course as a whole, and reduce disease pressure on the turf. The IPM Program contains requirements for turf aerification (i.e., small-scale localized drainage improvements), but it is beyond the scope of an IPM program to include a course-wide full-scale drainage rehabilitation plan.

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**E N V I R O N M E N T A L   A S S E S S M E N T**

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FINDING OF NO SIGNIFICANT IMPACT

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PRESIDIO GOLF COURSE INTEGRATED PEST MANAGEMENT PROGRAM



October 18, 2002

This Finding of No Significant Impact (FONSI) has been prepared with respect to the proposed action as described in the *Presidio Golf Course Integrated Pest Management (IPM) Program* and as evaluated in the corresponding *Environmental Assessment (EA)*, both dated July 2002. The project site is located at the Presidio of San Francisco in the Golden Gate National Recreation Area (GGNRA). Arnold Palmer Golf Management (APGM) is the project proponent, and the Presidio Trust (Trust) is the Lead Agency.

In preparing the IPM Program EA, the Trust took a hard look at the potential environmental effects associated with the proposed IPM Program and has determined that the proposed action will not have a significant effect on the human environment and will not, therefore, require the preparation of an Environmental Impact Statement (EIS). The Trust made this determination by considering the proposed IPM Program, information and analysis of impacts of the IPM Program presented in the EA, as well as input received during the 30-day public scoping period and subsequent 45-day public review and comment period on the EA, which closed on August 23, 2002. A summary of scoping comments is provided in Section F of the EA. One comment letter from the National Park Service was received during the public review period, and a copy of the letter and the Trust's response are presented in Attachment 1 (Public Comment) of this FONSI. Minor corrections were made in finalizing the EA and IPM Program as described in Attachment 2 (Errata). The IPM Program (Volumes I and II), accompanying EA, and Attachments to the FONSI are incorporated by reference herein.

## 1 Project Background

The purpose of the project is to provide a comprehensive and coordinated approach to pest management for the Presidio Golf Course (PGC) that is effective, practicable, and environmentally safe and limits the use of chemical controls. The need for the proposed action was first identified in the Presidio General Management Plan Amendment (GMPA), the National Park Service's (NPS) plan for the Presidio, and subsequently in the Presidio Trust Management Plan (PTMP) which was recently adopted by the Trust and updates and supercedes the GMPA for Area B of the Presidio. Preparation of an IPM program was also a requirement of APGM's concession contract negotiated by the NPS to manage the course.

Over the last several years, there have been several iterations of the IPM Program beginning with APGM's initial submittal of a conventional plan for pest management at the course. That plan relied significantly on chemical control considered unduly toxic for the site. Through extensive review and consultation with the Trust, the NPS, APGM, the public and an independent third-party IPM peer review expert, the initial plan has been substantially revised, and the "proposed action" as described below incorporates the results from this multi-year refinement and consultation process.

## 2 Proposed Action and Alternatives

### 2.1 Proposed Action

The proposed action, the PGC IPM Program (July 2002), is a holistic system for controlling pests in which pests are identified, action thresholds are followed, all possible control options are evaluated, and selected controls are implemented. The Program emphasizes preventative maintenance and non-chemical actions, and as a last resort, allows the use of low-toxicity chemicals (e.g. herbicides, fungicides, etc.) to control golf course pests. The choice of control options is based on effectiveness, environmental impact, site characteristics, worker/public health and safety and economics. One of the 12 low-toxicity pesticides identified in Volume II of the IPM Program could be used, but only on an as-needed basis. Need would be determined using the three criteria below, and these pesticides are included in the treatment protocols only for the specific pests that have occurred in the past or are likely to occur in the future on the course. Use of any of these pesticides would occur only: 1) after non-chemical controls have proven ineffective or infeasible; 2) according to established guidelines; and 3) when a pest level is reached that threatens an economic impact. Pesticides would be applied under restrictions to protect groundwater, surface water, park users, wildlife, and sensitive

plant communities. Best Management Practices would be implemented as well as requirements for monitoring and reporting to ensure that environmental effects are avoided or minimized.

## 2.2 Other Alternatives Considered

If the PGC IPM Program were not implemented, pest management decisions would continue to be made on a case-by-case basis and there would be no comprehensive or coordinated approach. There would be no requirement for preventative maintenance, no staged consideration of non-chemical actions before chemical controls are applied, and no requirements for monitoring and reporting. Although the Trust would review and analyze each request for chemical application to minimize its environmental effects, no long-term organized strategy to prevent pests or manage them without the use of chemicals would be implemented. Under this more ad-hoc approach, protection of the environment is less predictable and could be less assured.

In preparing and refining the IPM Program, the Trust considered a wide range of alternatives none of which offered the heightened level of environmental protection of the PGC IPM Program. Other alternatives considered included:

- Conventional Golf Course Pest Management Alternative;
- Reduced Pesticide List Alternative; and
- No Pesticide Use Alternative.

Refer to Section D of the EA for a description of other alternatives considered, along with an explanation of why these alternatives were removed from further evaluation.

## 3 Public Review

### 3.1 Scoping

In October and November of 2001, the Presidio Trust requested input as to the scope and content of the environmental information to be provided in the EA from the public and federal, state and local agencies. An agency scoping letter seeking early participation in the NEPA process, specifically input that was germane to each agency's statutory responsibilities in connection with the proposed project, was sent to 16 government agencies, including the California Governor's Office of Planning and Research, State Clearinghouse, which subsequently distributed the request to an additional 14 State agencies. Through various meeting with staff, the Trust also solicited early input on the scope of the EA from the NPS and sought input from the Presidio Committee of the GGNRA Citizen's Advisory Commission. Furthermore, the Trust sought public input more broadly during the scoping process by soliciting comment on the project and the preparation of the EA in the October edition of the Presidio POST - the Trust's monthly newsletter with a distribution of more than 12,000 individuals, organizations and agencies that are interested in activities at the Presidio. A scoping announcement for the project and EA was also posted on the Trust's website ([www.presidiotrust.gov](http://www.presidiotrust.gov)).

### 3.2 Public Review and Comment on the Environmental Assessment

The Trust placed an announcement of the availability of the *Presidio Golf Course IPM Program EA* in the July 2002 Presidio POST and on the Trust's website. Copies of the IPM Program and draft EA were distributed to local libraries, made available at the Presidio Trust library located at 34 Graham Street in the Presidio, distributed federal, state and local agencies and interested members of the public. The draft EA was also posted on the Trust website. In response to a request made by the NPS, the Trust extended the review and comment period on the draft EA from 30 to 45 days.



3.3 Public Comments and Response

Only one comment letter, from the NPS, was received during the 45-day comment period, which closed on August 23, 2002. The Trust has reviewed, considered and responded to these comments in Attachment 1 (Public Comment) of this FONSI.

**4 Disposition of Environmental Effects**

The Trust concludes that the proposed action will not have a significant impact on the human environment. The data and analysis supporting this conclusion is fully set forth in the IPM Program (Volumes I and II) and accompanying EA. Based on this information and analysis and the entire agency record, the Trust has determined that there will not be significant direct, indirect or cumulative impacts to the human environment.

The protection of the human environment was a central consideration in the development and refinement of the IPM Program. The underlying premise and emphasis of the Program is to proactively prevent and manage pests without chemicals unless prevailing circumstances demonstrate a need. Need is determined only after non-chemical controls have proven ineffective or infeasible. The Program has been carefully designed to avoid impacts by focusing on preventative maintenance, quick detection, use of non-chemical controls, and when needed, limited use of low-toxicity pesticides. The Program also incorporates Best Management Practices to ensure the protection of the environment and human health and safety. As an added measure to ensure environmental protection, all proposed pesticide use will be subject to a site-specific analysis (Relative Aquifer Vulnerability Evaluation or RAVE) prior to application. The RAVE assessment takes into account many factors including persistence, soil texture, distance to groundwater, and distance to surface water and assigns a relative risk ranking. Under the IPM Program, any application that poses a moderate or greater risk to groundwater would be prohibited. Other measures incorporated as part of the Program to protect environmental resources include the use of natural buffer zones in which all pesticide use is prohibited, and other restrictions related to the timing, application and use of chemicals. The Program also incorporates monitoring and reporting requirements that will assist the Trust and APGM in tracking the overall effectiveness of the Program, as well as future adaptive management strategies to improve the Program’s success. With its many built-in procedural and substantive protections, implementation of the proposed IPM Program will not result in significant adverse impacts on the environment.

**5 Finding**

The Trust concludes that appropriate alternatives to the proposed action have been analyzed, and that the proposed action will not generate a significant adverse environmental effect on the human environment. Therefore, preparation of an EIS is not necessary for this project. There are no significant unmitigated adverse impacts on public health, public safety, threatened or endangered species, sites listed on the National Register of Historic Places, or other unique characteristics of the project area. Implementation of the action will not violate any federal, state, or local law. Therefore, in accordance with the National Environmental Policy Act, 42 U.S.C. §§ 4321 et seq., and its implementing regulations, an EIS will not be prepared. For further information concerning this decision, contact Allison Stone, NEPA Compliance Coordinator, at (415) 561-5300, or at The Presidio Trust, 34 Graham Street, P.O. Box 29052, San Francisco, CA 94129-0052.

Dated: October 17, 2002

APPROVED: \_\_\_\_\_  
 Craig Middleton  
 Executive Director, Presidio Trust

DATE: \_\_\_\_\_



***Responses to National Park Service Comment Letter******August 23, 2002***

## Water Quality

*1<sup>st</sup> bullet*

In response to the NPS suggestion, one additional stormwater sampling location will be incorporated into the monitoring program.

*2<sup>nd</sup> bullet*

The CA Department of Health Services was sent a copy of the EA at the beginning of the public comment period, and did not respond with any comments.

*3<sup>rd</sup> bullet*

All testing of water samples will be done in accordance with EPA-approved standards. Appendix A has been revised to indicate laboratory capability to detect each pesticide listed in the Program at acceptable detection levels.

*4<sup>th</sup> bullet*

One of the stated objectives of the IPM Program is to minimize risks to the human health, wildlife and the environment. As explained in detail in the IPM Program and EA, heavy emphasis on the use of non-chemical measures, monitoring, and other preventative actions reduces and minimizes the need for chemical applications. In the event that chemical applications are deemed necessary, the Best Management Practices outlined in Chapter 12 of the IPM Program would be implemented to keep pesticides from adversely or significantly impacting water quality. Further, section E-9 of the Environmental Assessment, along with the following paragraph, discuss how the pesticide selection process eliminated pesticides from the Program that have a high potential to leach to groundwater. Three of the four documents referenced by the NPS were reviewed and considered in the preparation of the IPM Program and EA. The NPS does not specify the source of the purported conflict amongst these documents and the EA, and the Trust disagrees that these documents contradict one another.

The USGS National Water Quality Assessment Program's 1998 document entitled *Pesticides Used on and Detected in Groundwater Beneath Golf Courses*, compiled by Jack Barbash includes a list of 115 pesticides and pesticide degradates that have been used on a wide-range of golf courses. Of those 115, the document shows that twenty-three have been documented in groundwater beneath at least one golf course. None of those twenty-three chemicals that have been documented in groundwater beneath golf courses is included in the PGC IPM Program. Thus, the statement in the EA that "all pesticides that have been documented as having been found in groundwater beneath golf courses (Barbash 1998) were removed from the IPM Program" is accurate. This issue was previously discussed with NPS natural resources representatives at a meeting on the PGC IPM Program on April 17, 2002.

*5<sup>th</sup> bullet*

The NPS's recommendation that Heritage be removed from the IPM Program is noted, and this fungicide has been retained. The following is a summary of the scientific sources that were considered in including both Heritage (with the active ingredient azoxystrobin) and Turflon (with the active ingredient triclopyr) in the PGC IPM Program.

1. The US EPA pesticide fact sheet for azoxystrobin (available at <http://www.pmac.net/azoxy.htm>) indicated it to be relatively immobile and non-persistent in actual use. It states "laboratory studies show that Azoxystrobin is moderately persistent in soil in the absence of light and potentially moderately mobile in coarse textured soils (e.g., sand and loamy sand soils)." (I.e. comparable to PCG soils.) Upgradable, supplemental field dissipation studies indicate that Azoxystrobin was moderately immobile and relatively non-persistent under actual use conditions."
2. The USDA pesticide fact sheet on triclopyr (available at <http://infoventures.com/e-hlth/pesticide/triclopyr.html>) states: "The potential for leaching depends on the soil type, acidity and rainfall conditions. Triclopyr should not be a leaching problem under normal conditions since it binds to clay and organic matter in soil. .... [soil] microorganisms degrade triclopyr rapidly." Triclopyr use would be permissible along fairways or because these areas have a high soil organic matter content to impede mobility.



3. The PGC IPM Program requires measures and management practices which are listed in the *IPM Handbook for Golf Courses* (Schumann *et al.*, 1998), to decrease the risk of leaching: only apply pesticides to areas with vegetative cover (never to bare soil), irrigation guidelines to prevent overwatering, and a ban on applying a pesticide during or within twenty-four hours before an expected rain.

It should be noted that both compounds have been approved for use on PGC by the NPS Presidio IPM Coordinator in the years 2000, 2001, and 2002. In addition, the IPM Program requires that a Relative Aquifer Vulnerability Evaluation (RAVE) be conducted for each potential pesticide application. The RAVE takes into account many factors including persistence, soil texture, distance to groundwater, and distance to surface water. Through this review process, which was recommended for use by the NPS, any application that poses a moderate or greater risk to groundwater would be prohibited.

*6<sup>th</sup> bullet*

The NPS's recommendation is addressed in the PGC IPM Program. As stated in Section 3.3 of the IPM Program, the course is to be irrigated in a "cycle and soak" manner during individual irrigation events in which water is not continually applied. In this way, the water would be periodically turned off to allow the water to move into the soil profile before more water is added, preventing the occurrence of runoff. Please note that the section of the PCG IPM Program cited by the NPS where soil is allowed to dry out between irrigation events applies to a broader set of circumstances. Rather than replenishing the soil each night with the amount of water that was lost due to evapotranspiration, the soil is allowed to dry out so that the subsequent irrigation can be longer and deeper, which encourages the growth of deeper roots without causing runoff.

Relative Aquifer Vulnerability Evaluation (RAVE) Factors Scoring Procedure

*1<sup>st</sup> bullet*

The NPS questions the usefulness of the RAVE model, but the criticism is unsupported. The Trust disagrees, and believes that the use of the RAVE model, in conjunction with the protective and non-chemical measures established in the IPM Program provide a sound and scientifically based approach to management of the PGC.

The RAVE model is the best available evaluation tool that to systematically assess risk to groundwater in the field. Throughout the IPM Program development process, NPS and other experts in the field have offered no better evaluation tool. It is well documented that the factors included in the RAVE: depth to groundwater, soil texture, percent organic matter, topographic position, distance to surface water, annual precipitation, pesticide application frequency, pesticide application method, and pesticide leachability, are good predictors for risk of groundwater impacts. Soil texture and percent organic matter were surveyed on the course in the summer of 2000, and are well outlined in the IPM Program. Topographic condition and distance to surface water are easily determined by a topographic map, which is included in the IPM Program. Annual precipitation is known for the course, and is included in the document. Pesticide application frequency and method will be known by the course superintendent and Pest Control Advisor for any given proposed application. Pesticide leachability is documented by various sources, including US EPA and university pesticide assessments, and the leachability of each pesticide approved for use is listed in the PGC IPM Program. Depth to groundwater is based on well borings taken near Mountain Lake (directly adjacent to the course) and near the golf course clubhouse. This data is used in conjunction with known elevation and topographical information to provide a good estimation of depth to groundwater anywhere on the course.

In addition, the RAVE model has been used by the NPS in IPM Plans for other National Parks, including the Fort Vancouver Invasive Exotic Plant Management Plan. Further, the *Users Guide for the Vegetation Management Risk Assessment for Herbicide Use in Forest Service Regions 1,2,3,4 and 10 and on Bonneville Power Administration Sites* (December 1992) in which RAVE is used to assess risk to groundwater, was presented by the NPS Presidio IPM Coordinator at the Sept 13, 2001 San Francisco IPM Technical Advisory Committee Meeting as a cutting edge guide for pesticide risk assessment.



*2<sup>nd</sup> bullet*

A RAVE score will be calculated for each individual (i.e. site-specific) area where a pesticide application is proposed. For instance, if it is proposed that a pesticide be applied to five fairways, a RAVE will be done for each of the five fairways.

*3<sup>rd</sup> & 4<sup>th</sup> bullets*

The citation of page 122 in the PGC IPM Program was a mis-print; it should have read “i.e. RAVE scores of 45 or greater.” It has been corrected in the Final Program. By relying up on control protocols that pose no greater than a moderate risk to groundwater, the risks of groundwater contamination have been minimized to the greatest extent feasible while still achieving the need for an effective and practicable program.

*5<sup>th</sup> bullet*

Since adjuvants that would increase the leachability of a pesticide would not be used under the program, the effects of adjuvants on pesticide leachability would not be necessary as part of the RAVE assessment for the PGC. Please refer to section 12.9 of the PGC IPM Program. However, if an adjuvant were proposed for use, that adjuvant will be included as part of the RAVE assessment, and the Program has been edited to clarify this.

## Wildlife

The IPM Program addresses potential impacts and corresponding mitigation for the protection of wildlife. The protection of wildlife, as well as human health and the environment, are stated objectives of the project. Pesticides classified by the pesticide label, MSDS, Exttoxnet, and/or USDA Pesticide Factsheet as moderately to highly toxic to birds, mammals or the most commonly tested non-target insect (bees) were specifically excluded to minimize potential impacts to wildlife. In addition, the Program requires that use of these low-toxicity compounds be allowed only if non-chemical and other preventative maintenance actions have proved ineffective. The Program establishes a series of Best Management Practices (BMPs) and other protective measures to ensure that any application is done a manner which is protective of wildlife. Please refer to Chapter 12 for additional discussion of this issue.

## Application of Pesticides

The pesticide labels and MSDS, as presented in Volume II of the IPM Program, identify application procedures and restrictions. In some instances, the IPM Program establishes additional application restrictions and spot-treatment requirements. For instance, in order to use Roundup on broadleaf weeds, the Program states “Apply as spot treatment with sponge applicator, hand-held sprayer or backpack sprayer.” Please refer to the individual pest management option tables in Chapter 11 for additional detail.

## Monitoring

*1<sup>st</sup> bullet*

The IPM Program outlines the limitations of TurfSite, namely that it is not widely used on the West Coast. However, it is the only service of its kind available at this time, and it is a service that was recommended for this Program by Carol DeSalvo, the NPS Washington Regional IPM Coordinator. Due to the TurfSite limitations, the Program does not allow any pesticide applications based solely on TurfSite forecasts to occur. TurfSite data is always used in conjunction with site-specific action thresholds.



*2<sup>nd</sup> bullet*

The inspection times established in the IPM Program are based on the Trust's working knowledge of the Presidio Golf Course operations. Based on this experience, this schedule has proven to be more than adequate for monitoring and effective management. Using the prescribed monitoring schedule, no pest problem has taken the APGM or Trust by surprise. Further, the Trust and APGM have been able to treat many of these pests non-chemically, by early detection and through the subsequent application of cultural management techniques. In addition, the minimum inspection times established in the PGC IPM Program are comparable to other courses practicing IPM such as Crystal Springs Golf Course. The Trust believes the inspection and monitoring frequency is fully adequate, and more frequent monitoring would offer no measurable benefit.

## Cumulative Impacts

The pest management activities set forth in the IPM Program were specifically designed to incorporate protective measures for adjacent natural and forested areas. The Program establishes a "Natural Area Zone" at the course, which includes forested areas, where the use of pesticides is prohibited. In addition, the Program requires implementation of a variety of protective measures such as spray weather restrictions and buffer zones to prevent effects on non-target sites. The IPM protocols have been defined in such a way as to be self-contained and therefore not contribute to effects outside the project boundaries. Please refer to Sections E-22 through E-25 in the EA, and Chapter 13 in the PGC IPM Program for additional discussion of these issues.

## Coordination with NPS

The NPS/Trust MOA Regarding Natural Resources Management at the Presidio of San Francisco (PT-2002-MA-01) provides guidelines for coordination between the Trust and NPS on IPM Program and related matters. The Trust intends to coordinate with the NPS on proposals to add or change the PGC IPM Program.

## SUGGESTED CHANGES TABLE

All text corrections suggested by the NPS were made except the following, for the reasons stated below.

*Section 13.4.1 Wash Pad.* The IPM Program is not the appropriate document to prescribe wash pad filtration system monitoring. Currently the wash pad is serviced every month in the summer, and every three months through the rest of the year. During service visits, the service technician verifies that the filtration system is operating properly.

*Section 14.4 Reporting:* The NPS's suggestion that multiple copies of all lab analyses be provided to the Trust is noted. The Trust believes that the reporting requirements established in the IPM Program fully adequate and no change was made.



The following corrections to the IPM Program and corresponding EA are being made and incorporated herein by reference into the Agency Record. A Final IPM Program will be printed which reflects these changes.

PGC IPM PROGRAM EDITS		
Section/paragraph	Old Text	Revised Text (additions/changes highlighted)
2.5 paragraph 1	The Colma Formation is a poorly undulated sandstone that consists of flat lying fine-grained sand, silty sand, and occasional beds of clay derived from ancient sand dunes and alluvial material dating back to the Pleistocene in the last ice age (Schlocker, 1974).	The Colma Formation is a poorly <b>indurated</b> sandstone that consists of flat lying fine-grained sand, silty sand, and occasional beds of clay derived from ancient sand dunes and alluvial material dating back to the Pleistocene in the last ice age (Schlocker, 1974).
2.8.3 paragraph 2	A minor subbasin exists at the top of the course, which drains in a southeasterly direction.	A minor subbasin exists at the top of the course ( <b>half of hole 18</b> ), which drains in a southeasterly direction <b>toward Tennessee Hollow</b> .
2.8.3 paragraph 3	The first subbasin drains holes 1,2, 3, half of 8, 9,10, and 18.	The first subbasin drains holes 1,2, 3, half of 8, 9,10, and <b>half of 18</b> .
2.8.3 paragraph 3		Added: <b>The downstream end of this canal is intended to be restored to native habitat by the Presidio Trust, National Park Service, and Golden Gate National Parks Association, under the Mountain Lake Enhancement Plan.</b>
2.8.3 paragraph 5		As suggested by the NPS, the text was changed to include hole 5 in the second subbasin, and to clarify that the third subbasin ultimately drains to Mountain Lake.
3.2 paragraph 1 Turf selection guidelines		Added: <ul style="list-style-type: none"> <li><b>Invasiveness. Non-invasive turf grasses should be selected to reduce the possibility of the spread of non-native grasses throughout the Presidio.</b></li> </ul>
Table 12.1		Section numbers referenced in the table have been updated to reflect changes made since the previous draft in order to refer to the correct sections of the Program.
12.6 paragraph 1	A RAVE score will be calculated on a case-by-case basis for each pesticide application before it occurs, and no applications that pose a moderate or high risk to groundwater (i.e. RAVE score of 65 or greater) will occur on the course.	<i>The following typographical correction has been made:</i> A RAVE score will be calculated on a case-by-case basis for each pesticide application before it occurs, and no applications that pose a moderate or high risk to groundwater (i.e. RAVE score of <b>45</b> or greater) will occur on the course.



PGC IPM PROGRAM EDITS		
Section/paragraph	Old Text	Revised Text (additions/changes highlighted)
12.9 paragraph 1		Addition of the following sentence: <b>If an adjuvant would increase a pesticide's leachability, this must be accounted for in the RAVE analysis (see Section 12.6) of the application.</b>
13.1.7 paragraph 1	Applications with a RAVE score of 65 or greater shall not occur on the course.	<i>The following typographical correction has been made:</i> Applications with a RAVE score of <b>45</b> or greater shall not occur on the course.
14.3 List of stormwater sampling locations		Addition of a 7 <sup>th</sup> stormwater sampling location: <b>In the rough to the northeast of the back half of the 18<sup>th</sup> fairway.</b> <i>(This location point was also added to figure 4.)</i>
Chapter 13 Title	Chemical Pesticides	Chemical Pesticides: <b>Use and Restrictions</b>
Chapter 14 Title	Environmental Monitoring, Reporting, and Mitigation	<b>Water Quality</b> Monitoring, Reporting, and Mitigation
14.1	Monitoring of surface and near surface groundwater will be done to assess the movement, if any, of pesticides applied to the course.	Monitoring of surface <b>water</b> and near surface groundwater will be done to assess the movement, if any, of pesticides applied to the course.
14.2 paragraph 1	After any pesticide application on fairways, piezometers at the 1 <sup>st</sup> , 12 <sup>th</sup> , and 14 <sup>th</sup> fairways will be monitored for flow and sampled if water is available.	After any pesticide application on fairways, piezometers at the 1 <sup>st</sup> , 12 <sup>th</sup> , and 14 <sup>th</sup> fairways will be monitored for <b>the presence of water</b> and sampled if water is available.
14.2 paragraph 2	Approximate flow rate in gallons per hour or equivalent units will be recorded at the time of sampling.	Approximate flow rate <b>through the drain box</b> in gallons per hour or equivalent units will be recorded at the time of sampling.
14.3 paragraph 2	Samples will be analyzed for pH, total dissolved solids (TDS), nitrate, ammonia, sulfate, phosphate, and the last pesticide applied to the course.	Samples will be analyzed for pH, total dissolved solids (TDS), nitrate, ammonia, sulfate, phosphate, and <b>any pesticide applied to the course in the previous twelve months.</b>



PGC IPM PROGRAM EDITS		
Section/paragraph	Old Text	Revised Text (additions/changes highlighted)
14.5	If this assessment indicates that continued use of a pesticide poses a risk, consultation with qualified personnel from the Trust, and from one or more of the following organizations will occur: DPR, the manufacturer, the Trust, or other qualified experts.	If this assessment indicates that continued use of a pesticide poses a risk, consultation with the Trust IPM Coordinator, and one or more of the following organizations will occur: DPR, the manufacturer, University Extension, or other qualified experts.
14.5 Figure 60: Pesticide monitoring and use decision tree		Changed the decision tree so that the “consultation box” precedes the “Risk Present?” decision.



PGC IPM PROGRAM ENVIRONMENTAL ASSESSMENT (EA)		
Section	Old Text	Revised Text (additions/changes highlighted)
E-9	However, no requirements for preventative management or non-chemical pest management would be enforced. Consequently, the use of chemical pest management could increase, and chemicals with higher risk to groundwater could be called for.	However, no requirements for preventative management or non-chemical pest management would be enforced <b>under the No Action Alternative. Since it is the use of preventative management and monitoring to catch pests early that allows for the effective use of many of the low-risk pesticides</b> , pesticides with higher risk to groundwater could be called for <b>under this alternative.</b>
E-19&20		Added the following paragraph: <b>Under the No Action Alternative, pesticide storage and selection would be conducted according to CA EPA guidelines. Thus, storage requirements would be the same as the preferred alternative, but the selection of pesticides could be of higher risk pesticides (see Section E- 9). All applicable laws and regulations for the storage and handling of these materials would be implemented.</b>
E-25	Expose pesticides to fish?	Expose <b>fish to pesticides?</b>
E-31	These actions include projects implementing the Presidio Vegetation Management Plan, the Mountain Lake Enhancement Plan, the Draft Recovery Plan for Coastal Plants of the Northern San Francisco Peninsula, the Crissy Field Plan, the Tennessee Hollow Restoration Plan, and the Presidio Golf Course Habitat and Wildlife Management Plan.	These actions include projects implementing the Presidio Vegetation Management Plan, the Mountain Lake Enhancement Plan, the Draft Recovery Plan for Coastal Plants of the Northern San Francisco Peninsula, the Crissy Field Plan, the Tennessee Hollow Restoration Plan, the Presidio Golf Course Habitat and Wildlife Management Plan, <b>and the Lobos Creek Water Quality Management Plan.</b>

