

July 25, 2017

10386

Thomas Phillippi  
Phillippi Engineering Inc.  
425 Merchant Street, Suite 200  
Vacaville, California 95696

***Subject: Wildlife Hazards Analysis for The Farm at Alamo Creek***

Dear Mr. Phillippi,

This memorandum presents Dudek's findings from a wildlife hazards analysis (WHA) of The Farm at Alamo Creek project (proposed project). A portion of the proposed project site (approximately 56 acres) falls within the Outer Perimeter of the Travis Air Force Base (AFB) Land Use Compatibility Plan (Solano County Department of Resource Management 2015), and as stated in Section 5.8.2.c of the Land Use Compatibility Plan (LUCP), all discretionary projects located within the Bird Strike Hazard Zone and Outer Perimeter are required to consider the potential for a project to attract hazardous wildlife, wildlife movement, or bird strike hazards as part of the environmental review process required by the California Environmental Quality Act (CEQA). Therefore, the proposed project's potential to attract wildlife that could result in hazards to aircraft has been evaluated.

## **LOCAL REGULATIONS AND MILITARY GUIDANCE REGARDING BIRD-AIRCRAFT STRIKE HAZARD**

The proposed project is subject to two planning documents that require consideration of wildlife hazards to aircraft, as discussed below<sup>1</sup>.

### **Vacaville General Plan**

The Vacaville General Plan Land Use Element identifies Areas of Special Consideration, which are specific areas of the city where more detailed design and development guidance is applied (City of Vacaville 2015, p. LU 41 and Figure LU-7). Among these areas are the Travis AFB Airport Land Use Compatibility Zones, which are shown on Figure LU-5 of the Land Use Element.

---

<sup>1</sup>Federal Aviation Administration guidance (e.g., Advisory Circular 5200) does not apply to the proposed project because it only applies to projects near civilian airfields. Travis AFB is a military airfield,

The Land Use Element includes the following goals and policies relevant to development within the Travis Air Force Base Airport Land Use Compatibility Zones:

- |                 |   |
|-----------------|---|
| Goal LU-27      | Ensure that development near the Nut Tree Airport and Travis Air Force Base is compatible with airport uses and conforms to safety requirements.  |
| Policy LU-P27.3 | Ensure that land uses in the vicinity of Nut Tree Airport, or potentially affected by Travis Air Force Base, are compatible with airport operations and are consistent with the Airport Land Use Compatibility Plans for both airports.                   |
| Policy LU-P27.5 | Continue to refer development proposals within the Nut Tree Airport and Travis Air Force Base Compatibility Districts to the Solano County Airport Land Use Commission.   |
| Policy LU-P27.7 | Notwithstanding other provisions of the General Plan, land use changes and development approvals within the Vacaville Planning Area shall be consistent with the Nut Tree Airport and Travis Air Force Base Airport Land Use Compatibility Plans (ALUCP). |

### **Travis AFB Land Use Compatibility Plan**

A portion of the proposed project site (approximately 56 acres) falls within the Outer Perimeter of the Travis AFB LUCP (Solano County Department of Resource Management 2015), but outside its Bird Strike Hazard Zone, as shown on Figure 1. The LUCP requires a WHA be prepared if land uses are proposed within the Outer Perimeter of Travis AFB, as defined in the LUCP. The WHA must analyze the proposed project's potential to attract wildlife that could result in potential hazards to aircraft. Specifically, the LUCP requires the following:

- (a) Reviewing agencies shall prepare a WHA for projects that have the potential to attract wildlife that could cause bird strikes. If the land use development would comply with the policies of the 2002 LUCP with respect to bird strike hazards within the Bird Strike Hazard Zone, then based on the findings of the WHA, all reasonably feasible mitigation measures must be incorporated into the planned land use. Expansion of existing wildlife attractants includes newly created areas and increases in enhanced or restored areas.

(b) Outer Perimeter: Outside the Bird Strike Hazard Zone but within the Outer Perimeter, as shown on Figure 4, any new or expanded land use involving discretionary review that has the potential to attract the movement of wildlife and cause bird strikes are required to prepare a WHA. Expansion of existing wildlife attractants includes newly created areas and increases in enhanced or restored areas. The WHA must demonstrate wildlife movement that may pose hazards to aircraft in flight will be minimized.

(c) All discretionary projects located within the Bird Strike Hazard Zone and Outer Perimeter are required to consider the potential for the project to attract hazardous wildlife, wildlife movement, or bird strike hazards as part of environmental review process required by the California Environmental Quality Act (CEQA).

The LUCP also states that the Solano County Airport Land Use Commission (ALUC) would begin preparing an implementation program to address, among other things, the parameters of a WHA, including what a WHA must contain to satisfy the ALUC's review requirements, within 12 months of the adoption of the LUCP. At the time of this WHA preparation, the implementation program is not available. Therefore, the analysis provided in this WHA focuses on changes in bird strike hazards relative to existing site conditions and steps that should be taken to minimize attractiveness of the site to birds.

## **EXISTING BIRD ATTRACTANTS AT THE PROPOSED PROJECT SITE**

The proposed project site comprises 210.5 acres and is bounded by Leisure Town Road (Future Jepson Parkway) on the west, Hawkins Road on the north, Elmira Road and a portion of Old Alamo Creek on the south, and agricultural fields on the east (Figure 1). Although only approximately 56 acres of the project site falls within the Outer Perimeter, this section describes the existing uses on the entire project site that could attract wildlife, especially birds. Design features suggested later in the memorandum focus on the areas within the Outer Perimeter, which include the pond/detention basin and recreational fields.

### **Agricultural Land Uses**

Undeveloped agricultural land is adjacent to the northern and eastern boundaries of the proposed project site.<sup>2</sup> The proposed project site also includes agricultural land that has primarily been used for growing row crops, with the dominant crops depending on the year. The dominant crops

---

<sup>2</sup> The southern boundary of the proposed project site currently abuts Elmira Road where the Brighton Landing Specific Plan project is currently under construction adjacent to the south side of Elmira Road.

were corn and other cereal grains from 2007 to 2011, sunflowers in 2012, tomatoes in 2013, and alfalfa and clover from 2014 to present (Figure 2).

### **Surface Waters**

Existing surface waters on the proposed project site are limited to Old Alamo Creek, which traverses the southern portion of the site, and a Solano Irrigation District (SID) right-of-way that borders the site on the west and north and conveys irrigation water through an earth-lined ditch. Based on aerial photographs, the SID ditch appears to remain full or nearly full most of the time. Agricultural ditches traverse the property in various locations and are used to temporarily convey water to the on-site agricultural operations.

### **Non-Agricultural Vegetation**

On the northern and southern sides of the western portion of Old Alamo Creek that bisects the proposed project site there is a large grove of mature trees totaling approximately 1.5 acres. Dense stands of deciduous and evergreen trees such as these can provide roosting sites for flocks of starlings or blackbirds. Vegetation also surrounds the remainder of Old Alamo Creek further east, although it is primarily woody shrubs and herbaceous vegetation that provide minimal cover for roosting or nesting.

### **Structures**

One home and several outbuildings are located in the western margin of the site on Leisure Town Road.

## **EFFECTS OF LAND USE CHANGES AND SITE DEVELOPMENT ON BIRD ATTRACTANTS**

The proposed project would affect the attractiveness of the site for birds, with most of the alterations resulting in reduced attractants across the site, but with some project elements likely increasing the attractiveness of the site in particular areas (Figure 3).

### **Removal of Agriculture and Replacement with Urban Development**

The proposed project would include removal of approximately 188 acres of land in active agricultural use that would be replaced with developed land uses, including residential structures, community facilities, commercial development, and roadways. Agricultural operations on these lands in the last 10 years have included extensive areas of cereal grains and sunflowers, both of which are

highly attractive to birds when the crop matures. Alfalfa and hay have also been major crops on this site, and these crops can attract large flocks of birds when the crop is drying before harvest.

The proposed project would also change the earth-lined ditch that conveys agricultural water along the northern boundary of the site to a buried pipeline. The other irrigation canal that traverses the central portion of the site would be removed because it would no longer be needed. That would eliminate approximately 1.7 acres<sup>3</sup> of open water from the site that is available throughout the year for use by birds and that could be an attractant.

### **Construction of Detention Basin/Pond**

The proposed project includes an approximately 10-acre detention basin that would collect stormwater overflows from Old Alamo Creek. The basin is located in the southeast corner of the project site within the boundary of the Outer Perimeter, as shown on Figure 3. The basin would include irregular shaped banks, with a slope of 3:1 or 4:1. These relatively shallow slopes would allow large water birds to easily exit and enter the detention basin from the shore. The detention basin would be excavated to approximately 15 feet deep to accommodate peak flows from the Creek. Due to the shallow groundwater table, the lower portion of the basin would remain inundated year-round with 7 to 9 feet of water. This year-round inundation would provide an attractant for migrating birds within the Pacific Flyway and for other non-migratory birds seeking water during drought periods.

### **Addition of Recreational and Open Space Uses**

The proposed project would include a variety of open space and park features that have the potential to attract wildlife. Not all of these features are located entirely within the boundary of the Outer Perimeter as shown on Figure 3; the areas that overlap are noted below. The proposed 8.2-acre "Play 4 All" park falls partially within the Outer Perimeter but does not appear to contain elements that would attract birds, so is not included in the following list:

- Creation and landscaping of a recreational trail around the detention basin/pond—estimated as 5 total acres (entirely within Outer Perimeter)
- A City park with two soccer fields and a baseball park totaling approximately 11.2 acres (approximately 8 acres within Outer Perimeter)

---

<sup>3</sup> Based on a review of aerial photographs of the proposed project site, it was determined that water in the irrigation channels on the western and northern sides of the proposed project site are an average of 17 feet wide and extend 4,275 feet. With few exceptions, these channels were full to the banks in every aerial photograph regardless of the season.

- An open space/agricultural buffer area north of the detention basin totaling approximately 4.3 acres. (approximately 2.2 acres within Outer Perimeter)
- Landscaping and enhanced trails along Old Alamo Creek totaling approximately 4.6 acres (approximately 1.5 acre within Outer Perimeter)

These open space and park areas would result in a total of approximately 16.7 acres within the Outer Perimeter of a land use that could potentially attract birds.

Depending on the plants selected for landscaping within the recreational or open space areas, any of these areas have the potential to attract birds, either for perching/roosting or to consume fruits produced by the landscaping.

### **Landscaping within the Proposed Project Area**

The proposed project has prepared a preliminary planting palette (Tables 1, 2, 3, and 4). Tables 1 through 4 also provide brief analyses as to the potential for each species to attract birds and the type of attractions. The potential to attract birds is based primarily on their production of fruit or attractive seeds and canopy formation that encourages perching or roosting. Because of the distance of the project site from Travis AFB, and the fact that most of the site is located outside the Outer Perimeter, these attractants are much less important than if they were located near the AFB or within the Bird Strike Hazard Zone. Because they pose no threat to aircraft, the potential to attract hummingbirds are not considered adverse.

The Specific Plan notes that a key element of the proposed project would be fruit trees scattered around the proposed project site, and a large orchard along the east side of Leisure Town Road. These fruit trees have the potential to attract birds, especially if the fruit falls to the ground and is not promptly removed. Most groundcover planting would be native drought tolerant grasses. The grove of mature trees along Old Alamo Creek noted above would be retained and incorporated into a natural park area, and trees would be regularly trimmed and maintained.

### **SUGGESTED DESIGN FEATURES TO MINIMIZE WILDLIFE ATTRACTANTS AT THE PROPOSED PROJECT SITE**

This section identifies ways in which the proposed project could be designed to minimize bird attractants on the proposed project site. The suggestions are listed in order of priority, based on their expected effectiveness.

### **Pond/Detention Basin Design (High Priority)**

At approximately 10 acres of open water, this detention basin presents a substantial new source of water on the site. The design of the detention basin/pond can affect its attractiveness to waterfowl, which are the primary threat to aircraft. Below are some suggestions to reduce issues associated with the detention basin/pond:

- Increase pervious surfaces (e.g., pervious pavements, bioswales) elsewhere in the proposed project site to reduce the required size of the detention basin.
- Configure the detention basin and surroundings to reduce line of sight for birds. Many waterfowl have a shallow angle on their approach for landing or takeoff from water, and reducing their line of sight can make birds less likely to use an area of open water. This includes using steeper embankments (not less than a 2:1 slope), narrower/longer configurations (ideally a 3:1 minimum length to width ratio), shrub-height or greater height vegetation along the lip of the pond, post and cable fences, or other installations that disrupt sight lines and reduce comfort and habitat suitability for waterfowl. Given public access to the pond area, some of this may not be feasible for safety reasons, such as the steep slopes.
- Maintain a stand of trees between the detention basin/pond and any nearby fields so that large birds cannot easily pass between them.

### **Discouraging Loafing Birds on Park/Recreation Fields (Moderate Priority)**

Park/recreation fields can often provide an attractive space for “loafing” and grazing behavior for larger birds, especially Canada geese and coots. This is especially true if the fields are not in regular use. A portion of the recreation fields within a proposed City park would be located within the Outer Perimeter (Figure 3). If these species are found to be occupying the fields, an active hazing program should be developed to chase the birds away. Hazing can take many forms, but the presence of humans on the field on a regular basis can sometimes be enough to reduce the potential for loafing.

Some turf grass species such as tall fescue are less attractive for bird grazing, especially when compared to Kentucky bluegrass. Turf grass can also be treated with anthraquinone, which is available in commercial formulations with UV dyes visible to birds (but not humans). The dyes, combined with the unpleasant digestive effects of the anthraquinone, can condition the birds to avoid the fields.

### **Educational Signage (Moderate Priority)**

The proposed project should install signage near any areas where large birds such as ducks or geese might gather that discourage residents or visitors from feeding the birds. This would

include the recreation fields and the detention basin/pond. The proximity to Travis AFB, proper bird nutrition and health, and the issues regarding bird strike hazard, as well as the issues associated with loafing birds and sanitation, could be mentioned. These efforts could reduce human feeding of birds on site, which would help reduce bird aggregations on the proposed project site.

### **Eliminating Fruit Trees and Other Attractive Vegetation (Low Priority)**

The proposed project site is relatively far from Travis AFB, which reduces the importance of the on-site vegetation relative to wildlife hazards. However, the inclusion and promotion of fruit trees on the site is inconsistent with wildlife hazard management. Fruit trees can be a strong bird attractant, especially if the fruit is not removed before ripening. It is recommended that the number of fruit trees be reduced, and those trees replaced with ones identified as “low attractiveness,” as analyzed in Tables 1 through 4. If a greater number of fruit trees is desired, we recommend that grounds maintenance staff emphasize removal of fruits before they fall to the ground.

## **CONCLUSIONS**

Overall, by eliminating agricultural operations the proposed project will remove 188 acres of land use that attracts flocks of birds. However, flocks of smaller and medium-sized birds are not a primary concern within the Travis AFB Outer Perimeter Area. Because the proposed project is located outside the Travis AFB Bird Strike Hazard Zone, the key factor to consider is whether the proposed project would create a destination that birds would fly to, crossing the Bird Strike Hazard Zone in the process.

As noted in the effects analysis, two aspects of the proposed project have the greatest potential for new wildlife attractants that could make the proposed project site a destination. These aspects include the recreational fields, which can attract larger grazing birds such as Canada geese and coots, and the detention basin/pond, which can attract a range of larger-bodied waterbirds such as ducks, geese, and swans.

However, by implementing the suggested design features above, especially those that pertain to the detention basin and the park/recreation fields, the proposed project applicant can credibly state that they have reduced the bird attractants at the proposed project site to an acceptable level, and that the proposed project would not increase bird strike hazard to aircraft at Travis AFB.



Mr. Thomas Phillippi

Subject: *Wildlife Hazards Analysis for The Farm at Alamo Creek*

---

Sincerely,



Mike Henry, PhD  
Senior Ecologist

Att: *Figures 1–3*

## REFERENCES

City of Vacaville. 2015. "Chapter 2: Land Use Element." In *Vacaville General Plan*.

Solano County Department of Resource Management. 2015. *Travis Air Force Base (AFB) Land Use Compatibility Plan*. Adopted by Solano County Airport Land Use Commission. October 8, 2015.