

## Beth, Margarete@Waterboards

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**From:** Eileen McLaughlin <wildlifestewards@aol.com>  
**Sent:** Friday, August 22, 2014 4:08 PM  
**To:** Beth, Margarete@Waterboards  
**Cc:** High, Carin; florence@refuge.org; anne\_morkill@fws.gov; Eric\_Mruz@fws.gov; joseph\_terry@fws.gov; lisa.mangione@usace.army.mil; brush.jason@epa.gov; Laclair, Joe@BCDC  
**Subject:** CCCR comment letter, SFCJPA 401 Permit Application  
**Attachments:** CCCR comments-SFCJPA 401 Permit Application.pdf

Dear Maggie,

The attached letter provides the comments of the Citizens Committee to Complete the Refuge regarding the Revised 401 Water Quality Permit Application of the San Francisco Creek Joint Powers Authority.

We appreciate the opportunity to submit these comments to the Water Board.

Eileen McLaughlin  
Board Member, CCCR



## CITIZENS COMMITTEE TO COMPLETE THE REFUGE

453 Tennessee Lane, Palo Alto, CA 94306 Tel 650 493-5540 Fax 650 494-7640 www.BayRefuge.org

August 22, 2014

Margarete Beth  
Region 2, State Water Quality Control Board  
1515 Clay Street, Suite 1400  
Oakland, CA 94612  
Via Email: margarete.beth@waterboards.ca.gov

**RE: 401 Water Quality Certification Application for the San Francisquito Creek Joint Powers Authority's Bay to 101 Flood Reduction Project.**

Dear Ms Beth:

The Citizens Committee to Complete the Refuge (CCCR) appreciates having this opportunity to comment on the 401 Water Quality Certification Application (Application) for the San Francisquito Creek Joint Powers Authority (JPA) Bay to 101 Flood Reduction, Ecosystem Restoration and Recreation Project (Project). We have reviewed information provided with the Public Notice and have been actively monitoring and commenting on the Project for several years. In this letter we discuss unresolved concerns that are relevant to any Certification action.

CCCR works as advocates for the wetlands and wildlife of the South Bay's shoreline and on behalf of the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge). Faber Marsh lies within the Project's boundaries. Since April 1994 it has been managed by the US Fish & Wildlife Service (USFWS) as part of the Refuge under a Cooperative Agreement with the City of Palo Alto. In 1994 Faber Marsh was in the early stages of restoration after dikes were breached but, in the agreement, was described as "a unique tidal marsh ecosystem where at least two Federally-listed endangered species (the California clapper rail, salt marsh harvest mouse)...are found."<sup>1</sup> Today, that marsh ecosystem thrives as does the California clapper rail, now present in numbers that make Faber Marsh a key site in USFWS species recovery efforts for the San Francisco Bay. In fact, there have been years when the Faber Tract has the highest detection counts in the entire bay ecosystem. These are the ecological values that drew our attention to the Project and its original plan to put all of Faber Marsh, and potentially the similar Laumeister Marsh beyond it, in the path of overwhelming fluvial impacts.

The Project as described in its 401 Water Quality Certification Application (Application) includes proposals that would reduce impacts on Faber Marsh and its endangered species. Nonetheless, we remain very concerned that there are design options yet to be considered that might produce greater reduction of environmental impacts and, being the mouth of the San Francisquito Creek Watershed, a more sustainable and robust outcome.

Toward that end, these comments address the following points:

- The components of the Project that are most critical in timing and most suited for construction are the levee and floodwalls proposed to protect East Palo Alto, the design and location of these elements appear to remain constant regardless of the alternative considered.

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<sup>1</sup> Cooperative Agreement between the USFWS and the City of Palo Alto, April, 1994.

- The Palo Alto Municipal Golf Course sits in the heart of the historic and natural delta floodplain of San Francisquito Creek and, for this watershed, cannot be excluded from flood management solutions nor from this Project.
- Questions exist as to whether golf course floodwalls, the design currently chosen for the Project, may limit the range of flood control options upstream of Highway 101.
- The channel widening proposed by the Project seems insufficient for this 45 square mile watershed, and should be evaluated against functional capacity of other local creeks.
- Sediment dynamics in a tidal zone appears to be inadequately considered.
- Inadequacies exist in documents provided as part of the Application.

Note to Readers: The letter may use terms referring to locations within the Project that are also conventions of the Application.

Stream segments

Upper reach: Highway 101 to the Geng Road/Daphne Way bend.

Middle reach: Geng Road to Friendship Bridge.

Lower reach: Friendship Bridge to the Bay

### **Flood Protection of East Palo Alto**

As was well described by East Palo Alto (EPA) residents, speaking at the August 13<sup>th</sup> Board meeting of the Regional Water Quality Control Board (Water Board), this community has been repeatedly flooded and its residents repeatedly left to deal with severe consequences to their community. In this Watershed this is the residential community at greatest risk and with the least means to overcome flood-produced damages.

While the Project purpose is flood reduction, the design of components lining the EPA side of the creek in the Upper and Middle reaches, are and by necessity, designed for flood *protection*. In that light, design options are likely limited to the current design.

It is unfortunate then that certain Project components appear likely to undermine the effectiveness of East Palo Alto flood protection. Those components involve the level of protection given the golf course, a proposal that appears to prioritize protection of a golf course over protection of homes and residents along the Middle reach of the creek.

Levee Heights: The Project's construction proposals for the Middle Reach of the creek include specifications for at-build height that allows for post-construction compaction. Along the EPA side the levee would be 6" taller than final anticipated height. Along the left side, the levee would be 12" taller at-build. The Project explains<sup>2</sup> that this is due to differences in the compressible characteristics of underlying soils. Has that assumption been adequately analyzed? What is the variability in range of compaction and/or time of compaction that may be expected? But more important, why is there a proposal to provide equal<sup>3</sup> protection along the Middle Reach when the flood risk is clearly far, far greater to East Palo Alto and for which any degree of vulnerability of the golf course could reduce risk along the opposite bank? We are not well

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<sup>2</sup> Letter, GEI Consultants to HDR, consultant to the JPA, 6/30/14

<sup>3</sup> Public comments, Len Materman, Executive Director, JPA, 8/13/14

informed on homeowners flood insurance but wonder if a more vulnerable golf course levee would be supportive to reduced rates for EPA residents.

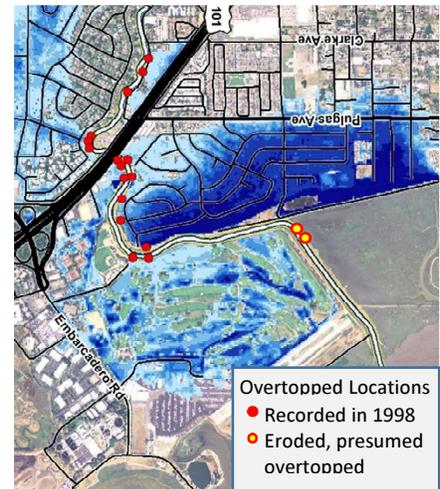
**Golf Course Flood Walls:** The Project proposes to build floodwalls on both sides of the stream in the Upper Reach. At the bend associated with Geng Road and Daphne Way access points, the floodwalls continue downstream into the Middle Reach at unequal distance on each bank first as visible structures and then as internal structures within levees.

Side of Creek	Floodwall Location	Floodwall-reinforced Levees Location
East Palo Alto <sup>4</sup>	Sta 57+88 to Sta 54+00	Sta 54+00 to Sta 52+50
Palo Alto Golf Course <sup>5</sup>	Sta 58+50 to Sta 49+00	Sta 49+00 to Sta 46+75

Locating these stations on HDR’s General Site Plan<sup>6</sup>, visually shows that the protection of the golf course extends significantly further downstream than for EPA. The same plan shows that the golf course levee remains reinforced well into the area of levee setback and widened channel. Those differences and the existence of any floodwall structure along the golf course raise multiple questions. Most importantly we wonder if these floodwall placements alter the level of risk for EPA residents because the floodwalls, in effect, would impound high water into the creek.

It is important to look at the historical characteristics of the golf course floodwall location. Prior to the stream’s manmade reconfiguration in the 1920s, the natural direction of the creek would have headed downstream into the golf course’s current location, following channels through tidal marsh to the Bay. In the large 1998 flood event, the fluvial forces repeated that natural pattern, overtopping the golf course levee.

With floodwalls shutting off the overtopping outlet of 1998, what changes can be expected in the in-stream pressure as the stream makes this sharp bend? What impacts will unrelieved pressure have in the Middle reach? Will the hard floodwalls protecting the golf course at this overtopping site produce a rebound effect that would increase water height, flow velocities, and put greater stress on the EPA levee and further downstream, potentially increasing impact on Faber Marsh Levee? Is there analysis of the function of the proposed widened channel that demonstrates that changes introduced by golf course floodwalls will be fully mitigated to produce no net increase of impacts?



The question is too, what would hydrological modelling tell us if the design retained access to the golf course as a floodplain during extreme events? There is a need to understand if and how golf course floodwalls would reduce high water impacts throughout the Project area.

We believe these these questions require additional analysis before any construction occurs along the golf course in the Middle reach. We ask that the questions be addressed.

<sup>4</sup> Application Appendices, HDR Sheets C-26 and C-27.

<sup>5</sup> Application Appendices, HDR Sheets C-29 and C-30.

<sup>6</sup> Application Appendices, HDR Sheet G-3

**The Palo Alto Golf Course is inseparable from the flood reduction actions that the JPA must provide.**

On July 31<sup>st</sup>, 2014, CCCR submitted, jointly with San Francisco Baykeeper, comments regarding Palo Alto's 401 Water Quality Certification Application for its Golf Course Reconfiguration Project. Comments in that letter overlap or augment comments here. Please consider that letter as included here by reference<sup>8</sup>.

Our prior letter detailed, at some length, a JPA planning process that gave priority to a reconfigured golf course before the public process for this Project began. As, originally, the JPA was the lead agency on reconfiguring part of the golf course, there appears to have been a great deal of time spent on that endeavor, time that could have been better spent on flood control plans.. The golf course planning actions also speak to a presumptive, set-in-stone plan establishing the golf course's current relationship to the Project.

How the direction of this Project got to that point is a mystery. The agreement<sup>9</sup> founding the JPA in 1999 lists its purposes:

2. PURPOSES. This Agreement is entered into by Member Entities under the JPA Law for the following purposes:
  - a. To facilitate and perform bank stabilization, channel clearing and other Creek maintenance.
  - b. To plan flood control measures for the San Francisquito Creek watershed.
  - c. To take actions necessary to preserve and enhance environmental values and instream uses of San Francisquito Creek.
  - d. To coordinate emergency mitigation and response activities relating to San Francisquito Creek.
  - e. To make recommendations to Member Entities for funding and alternatives for long term flood control for Member Entity consideration.

These purposes, in a document that has never been amended, establish an organization that has the authority to establish a visionary role looking at integrated watershed flood management. We wonder if JPA ever made a recommendation that the golf course location is vital to the creek as a watershed floodplain and needed in order to provide sustainable protection for climatic and sea level rise changes. Indeed there are visionary approaches<sup>10</sup> that are being used across the country, integrated into golf course designs, even some used for PGA events. This approach is used by watershed flood planners whose recommendations restrict floodplain land use to recreation such as golf and playing fields because that form of development is the least expensive to replace after a flood.

While it was stated emphatically during the August 13<sup>th</sup> meeting, we have also heard informally that the City of Palo Alto has said that it will not allow any more golf course land to be used for this flood project. If that is so, was the decision to forgo golf course use as a floodplain and/or to create a wider channel ever given public exposure for comment beyond the golf community?

Permit Overlap. Our July 31, 2014 letter discussed the difficulties produced when two projects that should be one are proposed to be permitted separately. During the CEQA processes we commented that the action impermissibly piece-mealed the Bay to 101 project, constraining the range of alternatives that should be considered. Through review of these two permit applications, it is obvious that the golf course action is part of the Bay to 101 Project. The entirety of at least this phase of the flood control projects along San Francisquito Creek must be reviewed as one permit. The resulting complexity of regulatory permitting is inevitable for a golf course split in uneven parts for permitting under two different lead agencies.

With that background in mind, we examined the Project's Application materials, looking for disclosure of related actions. It lists the golf course project in Box 24: Relationship to Other Projects, mentioning that it is

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<sup>8</sup>PA Golf Course 401 Public Notice Comments: [http://www.waterboards.ca.gov/sanfranciscobay/public\\_notices/](http://www.waterboards.ca.gov/sanfranciscobay/public_notices/)

<sup>9</sup> Joint Powers Agreement Creating the SF Creek JPA as of 05/18/1999: JPA Board Retreat Packet for 12/04/2013

<sup>10</sup> See Attachment: CCCR; introductory references on integration of floodplains and golf courses.

undertaken "...in response to the planning of this Project..." In its MMP, pg. 22, Impacts to Trees, it states that mitigation will occur "...in coordination of Palo Alto's Golf Course Project..." That's all the coordination we could find.

We did not find maps of JPA actions on the golf course that were complementary to Palo Alto's description of the area to be covered by each permit and of wetlands impacted, inclusive of lands added to the Bay to 101 Project and those used by the JPA for construction purposes. The Project's Application made no mention of coordination of actions as to when and how Palo Alto would take over management responsibilities of lands used for construction. We found no mention of post-use conditions that must be met before that transfer occurs. The MMP describes a five-year-period in which the JPA will be responsible for all monitoring and reports but without mention as to whether or not it retains any responsibility on the golf course.

If these two projects are permitted separately, the golf course approval must not be issued prior to the flood control project. There must be for a joint plan between the parties incorporating actions of both projects on the golf course site that are attached to both permits. It needs to clearly detail the permit areas, the impacts, the actions and the responsibilities. It needs to provide accurate visual maps and other graphics. The MMPs of both projects must be amended to remove any regulatory mysteries and the entirety of the coordinated plans needs a signed, mutual agreement by the parties.

### **Golf Course floodwalls may limit flood management options upstream of Highway 101.**

Previously, we raised concerns that the floodwalls along the golf course may impact EPA flood protection. We would like also to raise the concern that those same floodwalls may change dynamics in the Upper reach of the Project and by doing so create conditions that may limit the flood control options available upstream of Highway 101. We have not seen any analysis that addresses this concern. This is one reason, a watershed review of projects proposed along the length of the creek is necessary. Cumulative impacts of past, present and reasonably foreseeable projects must be considered in project design, project impacts, and any final permit for this current flood control project must not constrain the range of alternatives available for future phases of flood control along the creek.

In a no-floodwall scenario, extreme storm events with or without higher than usual tides have release available by flood flows overtopping into the golf course. It seems that option would help to more quickly move high water downstream. Conversely, with floodwalls in the same location, does a high, rigid, flat barrier slow the velocity of high water before it makes the hard bend into the Middle reach? We are concerned that the water height upstream of such floodwalls will be higher than it would have been without the floodwalls. One concern then is that the existing stormwater culvert that drains to the stream (Palo Alto side just below Highway 101) would be more likely to be blocked, backing up water into Palo Alto, East Bayshore Road and onto the freeway. Continuing upstream, we wonder would slowed high water rise high enough to slow the flow through the rebuilt CalTrans bridge? If that occurs, there would also be impacts upstream of the Highway 101 Bridge..

In January, 2014<sup>11</sup>, the JPA presented its first public meetings for its CEQA process for the Upstream of 101 project. Its presentation discussed a range of possible alternatives including an underground bypass culvert that would drain high water from points upstream and return that volume to the stream just above Highway 101. If it was determined that golf course floodwalls raise water levels in the Bay to 101 Upper reach to heights that slow flow and raise water heights upstream of the highway, then that is an impact that could limit the range of upstream options such as the bypass culvert.

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<sup>11</sup> SCVWD brochure describing project, p. 3:

[http://www.valleywater.org/uploadedFiles/Programs/Safe\\_Clean\\_Water\\_and\\_Natural\\_Flood\\_Protection/Priority\\_E/SanFrancisquito/SFCreekProject\\_Shell\\_011514%20web.pdf?n=4200](http://www.valleywater.org/uploadedFiles/Programs/Safe_Clean_Water_and_Natural_Flood_Protection/Priority_E/SanFrancisquito/SFCreekProject_Shell_011514%20web.pdf?n=4200)

We ask that analysis be provided that responds to questions raised here. The JPA needs to ensure that no action of this Project has impacts on the options otherwise available for flood management upstream of Highway 101.

The Project's goals listed in the Application's Box 14 include: "Accommodate future flood protection measures that might be constructed upstream of the Project." Yes, please.

**Limited channel widening is a waste of an opportunity.**

Another mystery of this Project is that it did not use the opportunity to widen channels all along the golf course. Clearly the very narrow channel built ~90 years ago cut off, at extreme high water, the option of the creek to spread out across the tidal marshes that had functioned as a delta floodplain. At the same time the stream could no longer find its own, most direct path to the Bay, diverted to continue in a constrained, narrow channel of sharp, unnatural bends and over a greater distance to its mouth. This is a change that has produced numerous flooding consequences.

Why then would this project not consider setting back golf course levees throughout the Middle and Lower reaches? Surely a wider, channel would provide much improved carrying capacity, providing what could be the highest level of function for oncoming fluvial waters, a much improved release valve throughout. As the entire project is tidally-influenced, the expanded capacity would much more easily respond to higher than usual tides and, going forward, to sea level rise.

In discussions considering protection of Faber Marsh, the question about setting back golf course levees is particularly relevant. If the channel is wider, the water height will be lower. As a result the Faber levee will overtop less frequently, producing less impact on endangered species, sensitive habitat and on marsh topography and hydrology. A healthy tidal marsh serves as an important habitat now but in the future of sea level rise, also an important storm surge protection for EPA. Thus improving protections for Faber marsh can contribute to the long term flood management resilience from a rising Bay.

We do not understand why such actions are not part of this Project. We wonder how they are handled on other creeks in similar settings and what may be informative about those examples. We ask that these questions about channel width be addressed.

**Sediment dynamics in a tidal zone appears to be inadequately considered.**

From the first of our investigations about this Project, we heard comments and concerns about sediment. But those comments all seemed to refer to the possibility that someday the sediment held back by Searsville Dam will need a place to go. At the time, the proposals were that the bulk of it would be moved in extreme events and could be sent to Faber Marsh, as no one was worrying about the marsh as significant ecologically and for endangered species. But those perspectives, then and now, are unknowns or conclusions of Stanford's Searsville Lake Studies and subsequent specific plans.

Someday Searsville sediment may need storage between the Bay and 101. The one thing the Project can do now is to not build a Project that obstructs future sediment options. Does it satisfy that need?

To our knowledge, the Project has published no analysis that discusses the existing sediment levels flowing downstream in combination with the sediment carried in by the tides which reach all the way to the Highway. It is only when considered together that sediment impact on the stream can be evaluated.

The Project proposes to re-vegetate the levee walls and slopes of widened channel. A Project response regarding water quality to the Water Board's most recent letter to JPA<sup>12</sup> highlighted the value of this marsh terrace to improve water quality by filtering out impurities. That very same filtering action captures sediment from upstream or the Bay that will gradually build the terrace height around plant roots. That's good for sustainable marshes. Not good for channel capacity and a reason for wider channels.

The Project proposes to excavate ~1000' to move the low flow channel laterally in the Middle reach, explaining it would "maximize conveyance" and because the existing channel would be too close to the toe of a new levee.<sup>13</sup> For a new, non-natural channel, what analyses have been performed to predict the likelihood of sediment from stream or tides filling it in and requiring maintenance dredging? The existing channel is known to be stable and has self-maintained in its naturally chosen location. Will the new channel remain as stable and effective? Will it seek to return to its former or other location? Or will it require regular maintenance dredging?

These are questions that need to be addressed.

### **Inadequacies exist in documents provided as part of the Application.**

In our review of documents, some information, included, in error or omitted, has drawn our attention and requires corrective action.

Application Box 15: Description of Activity and Environmental Impacts: Nowhere in the Application did we find discussion that updated wetland conditions as regards golf course lands that will be used temporarily or permanently for the Project. The description and tables provided represent conditions before Palo Alto decided to shut down part of the golf course, on the side near the creek, to be used for stockpiling for either the golf course or the Flood Project. Although we have not walked within the golf course and only on the Geng Road trail, it appears that some wetland areas may already be impacted. The Project should provide a current status description of wetlands that are Waters of the State.

Application Box 23: Other Permits: We were very surprised that JPA did not list either the USFWS or the National Marine Fisheries Service (NMFS) even though Section 7 Biological Opinions (BO) will be required from both before the US Army Corps of Engineers issues a permit. As both of these agencies allow up to 135 days to issue the BO, it would seem the agencies should be listed here for planning purposes. Through our involvement we are well aware that the JPA has been working, recently, very interactively with the USFWS. When we first became involved with the Project, informing the JPA about the ecological and species issues of Faber Marsh, the Project contact with the USFWS was scant at best even though a major part of the Project area was managed by the Refuge. Given that the NMFS representative, at the August 13<sup>th</sup> meeting of the Water Board, explained that the agency would be producing a Section 7 BO, it is a concern that there is no evidence of any prior communication between JPA and NMFS, communication that might previously have informed the Project, possibly regarding stream conditions that will not be acceptable to NMFS. In the Project MMP we noted reference to a NMFS document from the year 2000. What is the most current science for stream fish of concern? After hearing the NMFS comments on August 13<sup>th</sup>, did the JPA contact NMFS to identify any potential issues of concern?

MMP: We were pleased to read the long list of requested information to be included in the MMP that the Water Board sent to the JPA in the July 24<sup>th</sup> letter, given the ecological sensitivity of the Project area and stream. Unfortunately, we found that the MMP is sketchy and template-like. It is produced by the Santa Clara

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<sup>12</sup> Project Information Requested by the Regional Water Board for the New and Revised Certification Application Package, inclusion with the Application documents.

<sup>13</sup> Project Information Requested by the Regional Water Board for the New and Revised Certification Application Package, inclusion with the Application documents.

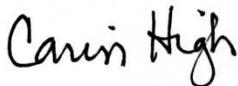
Valley Water District. We wonder if that agency's staff saw the Water Board's list of requested information. Its discussion of mitigations needed to protect the California clapper rail (CACR) and other marsh species was particularly disappointing given the JPA's frequent contact recently with the USFWS. For example the MMP fails to mention the construction window limitation needed to avoid disturbance to the CACR during nesting season (February through August). Surely that is a limitation that needs to be used when developing construction and monitoring schedules. We anticipate that the USFWS BO will provide specific requirements that will be applied through the USACE permit but the JPA already has information that could have been included in the MMP.

In the MMP, p. 22, there is a discussion of Impacts to Trees. As mentioned previously, in this section we find the only mention of coordination with Palo Alto's Golf Course Project, here for off-site locations for tree mitigation. Unfortunately, the examples of locations given are no longer being considered by the Golf Course Project. Further, simple reference to coordination with another party is insufficient information to use to define a mitigation nor to provide a monitoring measure.

As summary, we hope that the above comments are helpful in the Water Board's review of the Project's Application. We would like to strongly emphasize the importance of finding a way to protect East Palo Alto on the earliest possible schedule, regardless of any needs for changes in other parts of the Project. We want also to stress that defining the Least Environmentally Practicable Alternative required by the Clean Water Act cannot avoid the concern that a permitted project needs to be sufficiently robust to support and respond to future actions upstream.

CCCR is a 501(c)(3) nonprofit corporation established by citizens who led the efforts that founded the Refuge. Fully volunteer-run, it acts to ensure that the Refuge fulfills its Congressional acquisition authority to expand its land holdings to protect special and sensitive habitats and wildlife along the South Bay's shores. Very similarly, it acts on behalf of the continuous protection of wildlife, their habitats, wetlands and the very special lands of the Refuge.

Sincerely,



Carin High  
Vice-Chair  
CCCR



Eileen McLaughlin  
Board Member  
CCCR

**ATTACH:** Introductory Selection of Materials Discussing Integration of Floodplain Function with Golf Courses, a CCCR document.

**CC:** Florence LaRiviere, CCCR  
Ann Morkill, SFBNWR Complex  
Eric Mruz, Don Edwards SFB NWR  
Joseph Terry, USFWS  
Lisa Magione, USACE  
Jason Brush, EPA  
Joe LeClair, BCDC

# An Introductory Selection of Materials Discussing Integration of Floodplain function with Golf Courses

## 1. Golf Course Designs incorporating floodplain functions

Case Study: Flooded Golf Course Returned to Championship Form, Joanne Cheek P.E., Civil + Structural Engineer, May 2010;

[http://www.cenews.com/article/7872/flooded\\_golf\\_course\\_returned\\_to\\_championship\\_form](http://www.cenews.com/article/7872/flooded_golf_course_returned_to_championship_form)

Case Study: Black Hole Creek Golf Course Stream & Floodplain Restoration, LandStudies, 10-11-12;

[http://state.awra.org/pennsylvania/conference/2012ConferencePresentations/NutrientAndSedimentLoadReductions\(BenEhrhart\)\(10-11-12\).pdf](http://state.awra.org/pennsylvania/conference/2012ConferencePresentations/NutrientAndSedimentLoadReductions(BenEhrhart)(10-11-12).pdf)

Handbook: BMP 15: Get Multiple Benefits from Floodplain Restoration, pp 44-46, Golf Course Water Resources Handbook of Best Management Practices, June 2009, LandStudies, Inc and The Pennsylvania Environmental Council; [http://www.schuylkillwaters.org/news\\_files/Golf%20BMP%20Handbook.pdf](http://www.schuylkillwaters.org/news_files/Golf%20BMP%20Handbook.pdf)

History: Brookview Golf Course, Golden Valley, MN: <http://www.brookviewgolf.com/about/history.html>

News Commentary: The “18<sup>th</sup> Wonder”, A. Chansky, Chapelboro.com, 07/02/2013;

<http://chapelboro.com/columns/sports-notebook/the-18th-wonder/>

## 2. Reports and Articles addressing shoreline role as a floodplain

Article: Winning Strategies for Climate Resilience, Land Lines, July 2014; Published by the Lincoln Institute of Land Policy.

Article: Floodplain Golf Courses: Making profitable use of wetlands, Golf Business, August 1977;

<http://archive.lib.msu.edu/tic/golfd/article/1977aug34.pdf>

Local ordinance: Floodway, Floodplain & Wetland Overlay District, Ballville Township, Sandusky County, OH; <http://www.ballville.org/uploads/Forms/440%20FLOODPLAIN.pdf>