

December 8, 2009

Mr. Winston Rhodes, Planning Manager  
City of Pinole Planning Division  
Pinole City Hall  
2131 Pear Street  
Pinole, CA 94564  
*Sent via email: [wrhodes@ci.pinole.ca.us](mailto:wrhodes@ci.pinole.ca.us)*

RE: Consideration of Low Impact Development in Pinole General Plan Update

Dear Mr. Rhodes,

I am writing to you on behalf of San Francisco Baykeeper (“Baykeeper”) and its 1,300 members to recommend that the City of Pinole incorporate low impact development strategies into its General Plan update. Baykeeper is an environmental non-profit organization that has worked for twenty years to protect the water quality of the San Francisco Bay. Our work has focused on the largest source of pollution to San Francisco Bay and its many tributaries – polluted stormwater runoff. We believe that low impact development (“LID”), an environmentally progressive way to develop land, is one of the best ways to reduce stormwater pollution. LID seeks to maximize the amount of stormwater runoff that can be captured and treated by leveraging the natural hydrology and vegetation in the area that is being developed. Given the important linkages between land use development and water quality, Baykeeper is asking the City of Pinole to consider several relevant additions to the General Plan Update to protect water quality.

As the East Bay Region has become more urbanized, traditional, low-impact land uses have been replaced with expanding areas of impervious surface. Swaths of concrete and asphalt in the form of roofs, parking lots, and roadways prevent the natural infiltration of stormwater and alter the hydrology of the watershed. As a result, an increased amount of stormwater reaches surface water resources via the storm sewer system and overland runoff. As stormwater travels over impervious surface, it picks up pollutants such as oil, metals, pesticides, and nutrients, and delivers them to important creeks, rivers, and shorelines. As the amount of impervious surface increases, so does the volume and velocity of the stormwater reaching the creeks. Urban stormwater can enter creeks with such great force that it can cause significant soil erosion and hydromodification of the creek bank.<sup>1</sup> These changes can take a serious toll on the natural resources of an area. Research indicates that as little as 10% impervious surface area in a watershed can negatively impact aquatic ecosystems. If impervious area reaches 25-30%, aquatic diversity, stream habitat and water quality are consistently degraded.<sup>2</sup>

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<sup>1</sup> Pinole Creek Watershed Vision Plan: A Local Community Based Effort (2004) Urban Creeks Council of California and Restoration Design Group

<sup>2</sup> Negative impacts include a significant decline in the diversity of aquatic insects and fish and rapid decline in channel stability and fish habitat quality after 10% impervious area. See Table 1. Review of Key Findings of Recent Research Examining the Relationship of Urbanization on Aquatic Systems <http://www.stormwatercenter.net/monitoring%20and%20assessment/imp%20cover/impercovr%20model.htm>

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As the City of Pinole grows, it too is experiencing the negative impacts associated with expanding areas of impervious surface. The Pinole Creek Watershed suffers from the same issues that affect most urban watersheds. Persistent nitrogen exceedances in Pinole Creek are attributed to surface runoff during the winter months, which is then exacerbated by soil erosion.<sup>3</sup> San Pablo Bay, which receives waters from Pinole Creek among other tributaries, has been included on the 303(d) list for impairment due to exceedances in the limits of several pesticides (chlordane, DDT, dieldrin, and PCBs) as well as mercury. All of these chemicals reach the Bay through non-point source runoff, including stormwater.<sup>4</sup>

Stormwater has been the subject of intense and controversial water quality regulation for almost two decades. Conventional end-of-pipe methods of stormwater management have not been successful in preventing degraded water quality of the San Francisco Bay and its tributaries. This failure has led many in the water community to search for innovative solutions which are lower in cost to implement than conventional approaches and easy to maintain over the long term.<sup>5</sup> Consensus is building that Low Impact Development – an approach that maximizes the retention, infiltration and reuse of stormwater – represents just such a solution.

Low Impact Development (“LID”) is an approach to stormwater management that mimics natural hydrological processes to increase infiltration of stormwater and help restore the watershed’s natural hydrologic pattern. Under pristine conditions rainwater infiltrates into the soil, and biological processes filter out impurities before the water reaches groundwater supplies. The small volume of rainwater that flows off the surface meanders through vegetation which traps contaminants and slows the flow before it reaches a waterway. Some LID techniques, including treatment wetlands, rain gardens, bioswales, green roofs, and tree basins fall under the category of Green Infrastructure. Green Infrastructure elements increase the amount of vegetation in urban areas while naturally managing stormwater, reducing flooding risks, and improving air and water quality.<sup>6</sup> Other LID best management practices include rainwater cisterns and permeable paving systems. All of these features are highly effective at protecting water quality, maintaining creek hydrology, reducing peak flows, controlling flooding, and contributing to groundwater supplies. For example, the Gap Headquarters in San Bruno has a green roof that captures and stores approximately 70% of rainfall runoff.<sup>7</sup> In addition, because LID techniques rely on maximizing the implementation of vegetated areas, it offers additional environmental benefits by mitigating greenhouse gas emissions, absorbing air pollutants, reducing urban heat island effects, increasing local wildlife habitat and improving the aesthetics of an area.<sup>8</sup>

LID will be an effective tool for the City of Pinole to preserve and restore Garrity Creek, Pinole Creek, and San Pablo Bay. Pinole’s shoreline along the San Pablo Bay provides habitat for countless shorebirds in the salt marsh surrounding Finale Bayfront Park.<sup>9</sup> This shoreline area also offers several opportunities for low-impact recreation, such as kayaking and bird-watching.

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<sup>3</sup> SFEI Regional Watershed Program. (2005). Pinole Creek Watershed Sediment Sources Assessments.

<sup>4</sup> San Francisco Bay Regional Water Quality Control Board. 2006 303(d) list

<sup>5</sup> Low Impact Development Guidance and Training for Southern California Literature Review August 16, 2007 Draft

<sup>6</sup> Green Infrastructure Foundation. (2009). Green Infrastructure: Projects, Performance and Policies. Working Draft

<sup>7</sup> Water Sustainability: How will we do more with less? Presentation given by Bruce Wolfe, Executive Officer San Francisco Bay Regional Water Quality Control Board. October 30, 2008 [www.jointventure.org/programs-initiatives/sustainable/documents/Wolfe\\_Presentation.pdf](http://www.jointventure.org/programs-initiatives/sustainable/documents/Wolfe_Presentation.pdf)

<sup>8</sup> Green Infrastructure Foundation. (2009). Green Infrastructure: Projects, Performance and Policies. Working Draft

<sup>9</sup> City of Pinole. Open Space and Environmental Protection Element. Existing General Plan

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Pinole's riparian corridors also provide important habitat. Although largely disturbed, Garrity Creek is a site of potential salmonid habitat, and its freshwater wetlands are unique to the City.<sup>10</sup> Despite its urban location, Pinole Creek has maintained a self-sustaining steelhead population, as well as healthy populations of several other species of native fish.<sup>11</sup> The resiliency of the Pinole Creek and its potential for successful habitat restoration has prompted the creation of the Pinole Creek Restoration Project.<sup>12</sup> As the City of Pinole begins an intensive restoration of Pinole Creek (and as the City of Hercules pursues restoration of the downstream Chelsea Wetlands), it is more important than ever that the City take action to protect its investment in important natural resources. By reducing non-point source pollutant loading, capturing peak flows that cause erosion and recharging groundwater that allows for improved dry-season flow, the use of LID best management practices throughout the watershed will aid the success of these costly and time-intensive efforts.

Since the recent passage of the Municipal Regional Stormwater Permit for the San Francisco Bay Region, the City of Pinole is subject to the C.3 provisions of this NPDES permit, which establish requirements for LID implementation. We appreciate the progress that this program has made to address stormwater runoff pollution; however, we feel that the permit requirements are too narrow to effectively reduce the flow of polluted runoff from urban areas. The C.3 provisions do not describe a holistic approach to managing stormwater. They limit their focus to new and redevelopments that create more than 10,000 square feet of impervious surface, allowing municipalities to miss other opportunities to reduce stormwater pollution in smaller projects or by retrofit.<sup>13</sup> Because LID techniques are flexible and scalable, they can be applied to existing residential and commercial sites of all sizes to control storm water runoff beyond the requirements of the C.3.

While LID is by no means a new planning tool, it has been under-utilized due to flaws in its regulation and implementation. The Municipal Regional Stormwater NPDES Permit and the Contra Costa County Stormwater Permit that preceded it focused on single-project compliance, which places the onus on the developer to install appropriate stormwater controls. Under these regulations, stormwater controls are usually considered after the development has been constructed, presenting a challenge for the use LID techniques that mimic pre-development conditions. Because LID depends on an understanding of the site's natural hydrology, it is most effective when implemented at the beginning of the planning process rather than at the end.<sup>14</sup> Baykeeper believes that it is the responsibility of the City Planning Department to promote environmentally-progressive stormwater management by weaving LID into the fabric of City Planning for site-level as well as community-scale applications. The General Plan Update presents a unique opportunity for the City of Pinole to protect its surface water resources for enjoyment by future generations by changing how the city thinks about stormwater management.

Baykeeper is pleased to see the inclusion of LID concepts in many areas of the draft General Plan. The next section will offer examples of text from other municipalities' general plans, as well as suggested additions to the proposed text of the General Plan update, that will incorporate

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<sup>10</sup> City of Pinole. Open Space and Environmental Protection Element. Existing General Plan

<sup>11</sup> Mulcahy, Bert. (2009) Upper Pinole Creek Watershed Salmonid Habitat Assessment. EBMUD Natural Resources Department

<sup>12</sup> Pinole Creek restoration project. (2006) <http://www.ci.pinole.ca.us/redevelopment/docs/CurProj/Creek-Restoration.pdf>

<sup>13</sup> Municipal Regional Stormwater NPDES Permit for the San Francisco Bay Region (2009) Order 2009-0074

<sup>14</sup> Green Infrastructure Foundation. (2009) Green Infrastructure: Projects, Performance and Policies. Working Draft

LID more comprehensively into Pinole's General Plan. Please note that the names of the General Plan elements are written in bold font, below, the General Plan sub-headings are italicized, and any proposed textual additions are underlined.

## 1. **Natural Resources and Open Space Element**

Baykeeper would like to begin by commending the City of Pinole for encouraging the application of LID as a policy to achieve excellent water quality. This policy can be used as a springboard for the inclusion of LID throughout this element and the rest of the General Plan.

### *Issues and Considerations*

In this section the surface water resources of the City of Pinole should be adequately discussed in terms of their ecosystem function, value to the community and the threats to their health and survival. An explanation of water resources marks them with a degree of importance that justifies LID policies. The City of Richmond provides a good example by detailing the value of and challenges faced by their wetlands, baylands, and riparian corridors in the proposed **Conservation, Natural Resources, and Open Space Element**. The City of Richmond goes further to explain threats to surface water resources by detailing the problems associated with stormwater in a section titled *Water Quality and Urban and Stormwater Runoff*, also in their **Conservation, Natural Resources, and Open Space Element**. These sections answer the "what" and the "why" of stormwater management, lending context to the promotion of LID. For the actual text, please see Appendix A.

### *Goals Policies and Implementation Actions*

Once the context for LID has been established, the City of Pinole should flesh out the LID policy more fully. Baykeeper approves of the suggested policy changes under Goal OS.8 as provided at the Planning Commission meeting on August 24, 2009. Baykeeper would like to suggest three other implementation actions that the City can list to achieve its goal of excellent water quality. They are:

- a) Adopt the Ahwahnee Water Principles. The Ahwahnee Water Principles are an ideal model for incorporating water protection as a core concept into city planning. It states "community design should be compact, mixed use, walkable, and transit-oriented so that automobile-generated urban runoff pollutants are minimized and the open lands that absorb water are preserved to the maximum extent possible" and that "impervious surfaces such as driveways, streets and parking lots should be minimized so that land is available to absorb stormwater, reduce polluted urban runoff, recharge groundwater, and reduce flooding."<sup>15</sup> The Ahwahnee Principles have been endorsed and adopted by both the California Ocean Protection Council and the Local Government Commission as an effective approach to meet water quality protection. For more information in the Ahwahnee Water Principles, please see Appendix B.
- b) Implement a Green Streets Program. Green Streets Programs, like those that have been adopted by the City of San Francisco and San Mateo County, are excellent opportunities for the municipality to implement LID at a community-scale. As the initiative of the city itself, Green Streets Programs set a precedent for stormwater management in subsequent

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<sup>15</sup> Ahwahnee Water Principles. [http://www.lgc.org/ahwahnee/h2o\\_principles.html](http://www.lgc.org/ahwahnee/h2o_principles.html)

developments throughout the community. For more information on the San Francisco and San Mateo Green Streets Programs please see Appendix B.

- c) Require Achievement of a Watershed Performance Standard. A watershed performance standard can be determined by the achievement of numeric criteria within specific categories based on the ecosystem services that a healthy watershed provides. These criteria could include erosion prevention, flood reduction, and improved surface and groundwater quality.

## 2. Community Services and Facilities Element

Because the Community Services and Facilities Element discusses Pinole's aging infrastructure, it presents the perfect opportunity to promote the implementation of LID through green infrastructure. Green infrastructure, which overlaps with LID for most of its best management practices, promotes natural infiltration of stormwater while improving air quality, reducing the heat-island effect, and creating habitat. The benefits of green infrastructure as a replacement for traditional gray infrastructure should be listed as an *Issue and Consideration* in this element.

### *Future Civic and Community Facility Needs*

When the City suggests improvements to make public buildings more sustainable, it should include green infrastructure features or other LID techniques in addition to solar panels. For example: "Pinole should make public buildings and facilities more sustainable by adding solar panels and LID best management practices to effectively capture and treat stormwater on-site."

### *Storm Drainage and Flooding*

This section of the **Community Services and Facilities Element** suggests the development of a plan to implement the Municipal Regional Stormwater Permit; however, Baykeeper would like to see the City include language about LID in this section instead of relying on permit compliance to manage stormwater. For instance: "Flooding in Pinole generally occurs because drainage channels and pipes are inadequately sized to transport surface water. LID will reduce the volume of surface water runoff by capturing it on-site, thus relieving some of the burden on the aging stormwater system and minimizing flooding."

"...the City is working with the Contra Costa Flood Control District and the East Bay Municipal Utility District to identify opportunities to create an upstream detention basin in order to meter peak wet weather flows and reduce the potential for downstream flooding. Scalable LID best management practices installed throughout the watershed will also achieve this goal."

### *Goals Policies and Implementation Actions*

Policy CS.1.1 states that "The City will strive to provide safe, attractive, and efficiently-designed facilities for public and quasi-public organizations." The City of Pinole can achieve this policy by adding an additional implementation action that should state: "The City shall increase the aesthetic value and reduce the stormwater impacts of public facilities by applying LID best management practices that use natural features to capture and treat stormwater onsite."

Policy CS.7.2 begins to encourage LID by requiring that new developments strive for on-site capture of stormwater and preservation of natural drainage features; however, the policy falls short by not explaining LID fully. The City of Pinole can strengthen the policy by adjusting the text to fully embrace the idea of LID. For example: “Policy CS.7.2 The City will require new developments to implement LID best management practices to the maximum extent feasible. LID best management practices are scalable features that minimize the amount of off-site drainage by retaining stormwaters for on-site percolation or reuse and provide pollutant removal benefits. New development must provide adequate drainage facilities for remaining off-site flows, maintain and restore natural drainage channels, and avoid alteration of off-site drainage courses.”

By altering the text of Policy CS.7.2, the City can define and promote LID, but it will have to create an additional policy to go beyond site-level implementation and implement LID at a larger scale. For example: “The City will develop a plan to create a network of LID best management practices on public land that will that reduce flooding and manage stormwater across an entire neighborhood.” A Green Streets program is one action that could achieve this policy.

Baykeeper also recommends the language used in the Public Facilities and Services Element of the Yolo County General Plan 2030, specifically the policies associated with Goal PF-2 Stormwater Management. For the actual text, please see Appendix A.

### 3. Health and Safety Element

In the **Health and Safety Element** the City is required by the State to address water quality degradation. Baykeeper commends the textual changes that have already been made to expand upon the issue of water quality; however, this element could be improved by adding a discussion of LID in relevant sections, because LID is an effective solution to many water quality problems.

#### *Introduction*

When the City mentions water quality improvement as an issue that the General Plan seeks to address, it can suggest LID as the “how,” similar to the way in which it lists compact development and emissions reductions as ways to improve air quality. For example: “5. Seeking to improve San Pablo Bay, aquifer, and surface water quality in Pinole through LID best management practices that encourage on-site capture and percolation of stormwater in order to reduce downstream pollutant loading.”

#### *Relationship to Other General Plan Elements*

It is through the General Plan that the City can weave the idea of LID into the framework of city planning. LID is a holistic approach to stormwater management that relates to several elements of the General Plan, an idea that should be explained in this section. For instance: “Water quality is an important safety concern since the amount of impervious surface limits natural filtration, increases stormwater flows and urban runoff within the community, and causes the accumulation of contaminants in water bodies in Pinole...This component also relates to the Community Services and Facilities Element through specific policies that require the implementation of green infrastructure or LID best management practices to

manage stormwater in a way that will reduce pollution from urban runoff. The water quality component is also linked to the Natural Resources and Open Space Element through policies to encourage low impact development and natural groundwater recharge.”

#### *Flooding Hazards*

LID should be offered as an approach for enhanced flood protection in addition to the avenues explored by the Contra Costa Flood Protection District. For instance: “(2) reducing stormwater flows in the creek by diverting stormwater to a detention basin in the upper reaches of the watershed. Flooding should also be abated by installing LID best management practices throughout the watershed to capture stormwater flows on-site and ease the burden on channel capacity.”

Additionally, LID should be discussed with the Pinole Creek Watershed Vision Plan, because proper stormwater management throughout the watershed will aid in the success of this project by reducing pollutant loading, preventing creek bank erosion, and promoting groundwater recharge to improve dry-season creek flows.

#### *Water Quality*

The section on Water Quality should be expanded to the level of detail that is covered by the Air Quality section. Some issues that must be addressed in this section are:

- a) What are the pollutants of concern in Pinole’s surface waters?
- b) What are the beneficial uses of Pinole’s waterways and how are they impacted by negative water quality?
- c) What are the upstream land uses (urbanization, industry, agriculture, grazing) and how do they affect water quality?
- d) How are stormwater flows currently managed, and how does this system fail to protect water quality?
- e) What best management practices will be helpful in troublesome areas of the watershed?

For a specific example, see text from the **Conservation, Natural Resources, and Open Space Element** of the Richmond General Plan in Appendix A.

#### *Goals Policies and Implementation Actions*

Baykeeper applauds the addition of Goal HS.7 to ensure that new developments meet or exceed water quality standards. This goal and its associated policies are a progressive treatment of stormwater management in the General Plan. We would like to point out, however, that this goal misses existing properties as an area to implement LID stormwater controls through retrofit. Pinole should consider altering Goal HS.7 or adding an additional policy to include existing development as an opportunity to manage stormwater through LID.

Baykeeper would also like to suggest the following changes to the *Goals Policies and Implementation Actions* of the **Health and Safety Element**:

Policy HS.2.3 should be improved so that it encourages developments to achieve a level of stormwater management that goes beyond permit compliance. For example: “Continue implementing a Clean Water Program to reduce surface water discharge through low impact project design (e.g., reduce water runoff by minimizing impervious surfaces, use green areas

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for drainage) and ensure that development exceeds compliance with the National Pollution Discharge Elimination Systems (NPDES) act and the Clean Water Act to minimize stormwater runoff through LID to the maximum extent feasible.”

Under Goal HS.5 the City of Pinole should consider adding a policy that will encourage a holistic approach to residential development to make neighborhoods more sustainable. An example of this type of policy comes from the City of Sacramento General Plan and states that the City will “promote sustainable housing practices that incorporate a ‘whole system’ approach to siting, designing, and constructing housing that is integrated into the building site, consumes less water and improves water quality, reduces energy use, and other resources, and minimizes its impact on the surrounding environment.”<sup>16</sup>”

#### 4. Sustainability Element

In the upcoming **Sustainability Element**, the City of Pinole should be sure to acknowledge that preserving and restoring natural hydrology is a major component of being a sustainable city. As such, the City can strive for sustainability by adopting a “Natural Systems Approach” to development, like the one taken by the City of Seattle, WA in their Comprehensive Plan. The goal of the Seattle Natural Systems Approach is to “use natural systems to maintain and enhance environmental quality by having them perform such functions as cleaning air and water, and controlling storm water runoff.”<sup>17</sup> Two of the specific policies identified to achieve this goal are solving drainage problems through the restoration of natural watershed elements and controlling stormwater by increasing permeable surface. The policies and programs that are associated with a “Natural Systems Approach” could even go beyond stormwater pollution and flood control to address ecosystem services that are specific to Pinole.

By including LID concepts into decisions about growth and land use planning, Pinole could dramatically improve the quality of its waterways, protect natural resources and reconnect city residents to their natural setting. Successful, wide-spread implementation of LID will also enhance habitat restoration efforts and establish Pinole as a leader in municipal stormwater management. For LID to be effective, however, it must be incorporated into the foundation of the planning process. These suggestions are just the first step for the City of Pinole to make LID a priority of city planning. Appendix A details specific language from other municipal general plans. For a more in depth explanation of LID and examples of LID programs, please see Appendix B. Baykeeper is eager to help the City of Pinole take these steps to protect its water resources, and we hope that you will be in contact with any questions or concerns. Thank you for your careful consideration of these comments.

Sincerely,



Rosalind Becker, Program Fellow  
San Francisco Baykeeper

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<sup>16</sup>Sacramento General Plan. Housing Element Policy H-1.1.1.1 [http://www.sacgp.org/documents/City\\_of\\_Sac\\_Housing\\_Element\\_8-14-08.pdf](http://www.sacgp.org/documents/City_of_Sac_Housing_Element_8-14-08.pdf)

<sup>17</sup> Seattle Comprehensive Plan. Environmental Element.  
[http://www.seattle.gov/DPD/static/environment%20element\\_LatestReleased\\_DPDP016163.pdf](http://www.seattle.gov/DPD/static/environment%20element_LatestReleased_DPDP016163.pdf)