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Dear Mr. Hart,

Thank you for providing the opportunity to make comments on the Environmental Impact Report (EIR) for the City of Pasadena's Arroyo Seco Master Plan. It is clear that a great deal of work has put into both the plan itself and the EIR. In particular, the inventories of existing flora and fauna in Pasadena's portion of the Arroyo Seco Watershed are a significant contribution to our understanding of this landscape.

My comments on the EIR reflect my training in the Conservation Biology and Sustainable Development M.S. program at the University of Wisconsin-Madison. I have had the great fortune of putting this training to use over the past two years in a research project on the historical ecology of the Arroyo Seco watershed. This project, undertaken with Professor Beth Braker at Occidental College, hopes to construct the story of Arroyo Seco's changing ecology over the last 300 years. This project thus far has included a review of historic maps and photos of the Arroyo Seco, historical accounts of the Arroyo Seco by it's first settlers and land surveys conducted in the Arroyo between roughly 1850 and 1910, which have thankfully preserved in the collections of the Huntington Library.

I also write to you as someone who grew up in Pasadena, attended Tom Sawyer Camp, and ran cross-country in the Arroyo's scenic canyon.

I have three general comments on the EIR and then several comments on the assessment of impacts and mitigation measures of specific plan elements. First, the general comments, which I feel are most important.

1. The EIR has not adequately evaluated the habitat restoration plans within the Arroyo Seco Master Plan. The habitat restoration plans, described in the EIR's

Technical Appendices, focus almost exclusively on ecological structure (i.e. types of species to be planted) and ignores ecological function (i.e. how these species will interact with each other, wildlife and abiotic factors present in the system). The EIR does not take this omission into account and is not a fair and accurate evaluation of these proposed projects.

Constructing plant palettes and describing planting techniques will not fulfill the City's goal of restoring self-sustaining native plant communities in the Arroyo. It is necessary but far from sufficient. Unfortunately, this cookbook approach to restoration is all too common. It often prevails in planning studies because it is fairly easy to organize and implement and does not require long-term planning and thinking beyond a 10-year window for implementation of the planting plan.

The critical questions ignored in the Master Plan, and not asked by the EIR, have to do with how existing and proposed native plant communities will interact with their environment over time. The most basic of these questions include:

- What are the groundwater requirements for the native plant communities mentioned in the plan? The plan does not reference a map of the water table within the project area. This is a crucial variable to the establishment of natural vegetation within a riparian corridor.
- What are the surface water requirements for these communities? This is addressed in a minor way when discussing the relation between the willow scrub community and the water conservation pool behind Devil's Gate Dam. But there needs to be documentation that the locations suggested for habitat restoration and enhancement have the necessary water available to support the proposed projects. In the Lower Arroyo, for example, the plan mentions the use of a bubbling sprinkler system to support planted trees. This implies that there is not enough water to support these plantings in the natural environment. (Long-term, the most cost-effective way to make water available to proposed restoration and enhancement projects, in this and other parts of the Arroyo, is the removal of the concrete flood control channel and the restoration of historic springs.)
- How will these communities respond to flooding? This is again mentioned in passing with regard to the willow scrub planting around the conservation pool, but is not adequately addressed for the alluvial fan sage scrub, mule fat scrub or sycamore woodland communities in the Hahamongna area. This is an important issue for the restoration of the lower Arroyo as well. Enhancement and restoration projects in the Lower Arroyo have been offered without a coordinated plan for the release of water from Devil's Gate Dam. The plan itself says this must be taken into account but does not answer the question of what schedule or volume of water is desirable.
- How will these communities interact with wildlife? This omission is quite disturbing since creating viable wildlife habitat is one of the primary goals of

undertaking these projects. The closest the plan comes to addressing this is recommending a rodent control program to preserve young plantings. Focal wildlife species for the restoration projects need to be identified. Some thought must be given to which trees and shrubs will best contribute to a healthy mix of bird, mammal, reptile, amphibian and insect populations distributed across the appropriate trophic levels. The assumption that “if you build it, they will come” is not sufficient.

- How will the communities suggested in the plan sustain themselves over time? Plant communities are dynamic systems that naturally change in response to disturbance. The question of succession and the role of fire are conspicuously absent from the plan.
- What is the relationship between the recommended restoration projects and local soils? This is also a surprising omission. Soils are not mentioned at all in the Hahamongna portion of the plan and only in reference to wetland designations in the Central and Lower Arroyo. How can restoration plantings be recommended without an assessment of the soils that the plantings will go in? The plan states that “soil analysis will be conducted after the final grading to determine the fertility and planting suitability of the surface soils.” This analysis should be done in the planning stages of a restoration project, not during implementation. It is true that many of the soils in the Arroyo have been disturbed. This is all the more reason for some type of assessment prior to mapping out where certain plant communities should go. Our research has catalogued the original soils of the Arroyo Seco watershed and is available for use as a reference.

The exclusive focus on ecosystem structure in the restoration plan has also corrupted the performance standards that are recommended to judge the success of the project. These standards are related only to growth and coverage of the first generation of plants. They do not include indicators related to wildlife populations, especially focal or keystone species, enrichment of the soil, biodiversity measures or even regeneration of the key plant species. This is a snapshot view of ecology rather than one that looks at the establishment and maintenance of important ecological processes over time, which is the true test of ecological integrity. The Arroyo Seco Watershed Restoration Feasibility Study takes a more multi-dimensional approach to restoration of the Arroyo and can be utilized as a model in this regard for the City.

The EIR does not address these issues and so provides an inadequate evaluation of the habitat restoration and enhancement portions of the Arroyo Seco Master Plan.

2. The EIR has not adequately taken into account the historical record in evaluating the impacts of the Master Plan. The technical reports included in the EIR do not take into account the historic ecology of the Arroyo Seco watershed. The goals of the plan make several references to restoring historic conditions. More research is needed to establish what these conditions were over different periods of time and replace the broad assumptions currently guiding the plan. For example, the effects of historic springs on

the ecology of the canyon are not addressed. As another example, our own research suggests the willow scrub and mule fat communities were more limited in the Hahamongna area prior to the building of Devil's Gate Dam. To recreate some semblance of historic conditions, it is not clear to what degree these communities should be restored. The historical record provides a guide, not a blueprint, but it is an important piece of the puzzle that has not been given adequate consideration.

3. The EIR gives very little consideration to opportunities that exist for restoration beyond the areas currently classified as ruderal vegetation. Currently, almost all of the restoration projects take place in areas covered by ruderal, or non-native vegetation. Re-configuring these areas is a worthy goal. In order to realize the City's stated conservation goals, however, it must consider the potential for restoration in other areas of the watershed. For example, removing the concrete flood control channel and naturalizing stream banks is the single greatest action the City can take to conserve and restore the natural environment of the Arroyo. The plan presents this as a preferred option "where feasible" in the Central Arroyo in the same breath as recommending covering the channel near the Rose Bowl. This lost opportunity to make a significant improvement to functioning ecology of the Arroyo is not considered an impact in the EIR, even though the LACDPW that manages the channel is strongly supportive the concept. The steep slopes and developed areas of the Central Arroyo currently prevent the Arroyo from serving as a functioning corridor for terrestrial wildlife. Working with the RBOC and Brookside Golf Course to naturalize the stream channel is the only way to restore these connections. Research on urban ecology strongly shows that healthy urban streams and greenways are the most valuable ecological piece of the urban-nature puzzle.

As another example of a lost opportunity, the existing and proposed spreading basins in the Hahamongna area take up area that could be used to restore a greater amount of alluvial fan sage scrub habitat. The EIR already recognizes this remnant is under threat from sediment removal that may be necessary to protect these basins. An expanded floodplain with this habitat type would provide natural percolation and recharge to the Raymond Basin and may be compatible with the proposed pump-back system.

Within the context of shrinking natural habitat across Southern California, the fact that this habitat is extremely rare and considered a "hotspot" for biodiversity and the gathering extinction crisis facing the world as a whole, these lost opportunities do represent "significant environmental impacts" that cannot be ignored.

These three general areas are preface to the following specific comments on the EIR's assessment of the Master Plan

1. The EIR suggests that the impacts on the alluvial fan sage scrub (and the Nevin's barberry) can be mitigated by protective fencing. This is not practical. Impacts on groundwater, channel dynamics and wildlife all have the potential to reach beyond the limits of the fencing to impact this community. Further, the impact of sediment removal in this area (to protect the spreading basins) is not listed as a significant impact, even though the plan recognizes that this could destroy most of this remnant habitat. The

suggestion of parallel cuts in the sediment as a compromise solution is not fully explained. This solution, if it is practical as a mitigation, should come with diagrams and documentation of other location where it has been employed and proven effective.

2. The restoration plan described for the Hahamongna area relies too much on grading. Grading typically compacts the soil and reduces the chances of planting success. Measures taken to avoid compaction are not adequately explained.

3. It is not clear that creating two permanent standing lakes in the Hahamongna area is appropriate. Historically, this type of aquatic environment did not exist in the basin. The recreational benefit from these lakes would be minimal. The benefit to indigenous wildlife would be far greater if these areas were converted to plant communities historically present in the area. These lakes could, in fact, serve as a population sink for wetland bird species, drawing them to an isolated patch of habitat and making them vulnerable to domestic or wild predators. A better investment would be to restore the historic seeps and springs that once covered this area. The location Tibbets and Ivey Springs can clearly be precisely defined by survey records.

4. The plan seems to hope that the arroyo toad will not re-colonize the area. The EIR states that surveys will be done and if toads are found they will be re-located. The plan does not suggest, as you might expect, that the restoration projects will actually benefit the arroyo toad and aid in its recovery. This should be a goal, as the arroyo toad could serve as a focal species to judge the success of restoration projects. Enhancing toad habitat would mean enhancing and expanding alluvial fan sage scrub habitat in the basin.

5. The low-flow stream in the Lower Arroyo should be considered in relation to a larger plan for removing the flood control channel and more formally restoring a natural stream. The current project, while a useful start, is really a piece-meal attempt at stream restoration that in the future may become obsolete in the face of a more holistic approach to the channel.

6. The plan comes with no timeline for implementation. A timeline is important to judge the success of the project. In order to be successful, certain mitigation measures and actions, such as storing top soil, have a limited window of time during which they are viable strategies. How can the EIR judge the impacts of the plan without knowing how long implementation will take?

7. The process of monitoring and maintaining the restoration projects is not spelled out in enough detail. What would be monitored, how often and by whom? Rather than a simple monitoring program, taking an adaptive management approach, where monitoring forms the basis for corrective action and actual ecological research, would enhance the feasibility of these projects. The parameters of the monitoring and maintenance plan must be described in greater detail.

Thank you again for giving me the opportunity to comment on the draft EIR for the Arroyo Seco Master Plan. Addressing the issues raised above will require additional

research. While this research comes with additional cost to the City, it is a wise investment. Given the laudable goals that the City has identified of re-creating self-sustaining indigenous plant communities, the current restoration plan does not meet acceptable standards,. Because of its failure to identify many of these impacts, the EIR is inadequate and should not be approved in its current form. For all of its efforts in the Arroyo, the City of Pasadena deserves a restoration plan that addresses both structure and function, closely considers the historical record and takes advantage of the opportunities that exist for making a real difference in the conservation and enhancement of the area's natural resources.

I look forward to your response.

Sincerely,

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