10 Summary and Recommendations

10.1 Summary

Several alternatives were developed and evaluated as potential solutions to flooding in the Vista Grande Drainage Basin in Daly City, California. Brown and Caldwell evaluated the local hydrology and stormwater system hydraulics to develop operational design criteria. Gilpin Geosciences and Treadwell and Rollo assessed the existing geologic and geotechnical environment in which the preferred alternative could be constructed. Environmental Science Associates characterized the environmental backdrop and facilitated the discussions with many resource agencies. The agencies expressed their concerns and shared their ideas to help the City achieve the project's objectives. Overall, the project team developed a comprehensive flood control improvement study of alternatives which should be useful to the City as they consider the appropriate next steps.

10.1.1 Results and Evaluations

The project objectives can be satisfied through each of the alternatives examined in this report. Each alternative, however, has different attributes and characteristics which make a direct comparison difficult. Seventeen distinct storage and water conveyance options were examined in the initial screening evaluation process, seven of which satisfied the initial screening criteria. Those seven alternatives were further evaluated against the project objectives:

- Deliver public benefits
- Operate efficiently
- Be environmentally compliant
- Minimize land acquisition costs
- Maximize constructability
- Minimize lifecycle costs

Table 9.3 presents an example of the preliminary evaluation results for seven alternatives.

10.1.2 Preliminary Alternatives Ranking

Completing the evaluation methodology produces a ranked list of the alternatives. The results of the project team's evaluation are presented in Table 10.1.

10.2 Recommendations

The City's selection of the preferred alternative(s) must consider factors that are beyond the scope of an evaluation model. Accordingly, the ranking of alternatives shown above is preliminary and is based upon the criteria and the participants' knowledge and understanding of the project. We recommend that the City continue with its plan to thoroughly review the issues with City staff and include opportunities for public input. Additional discussions with permitting agencies would also clarify processes, durations, and required studies.

The evaluation of alternatives has been based on several assumptions which should be considered throughout the decision making process:

- The existing Vista Grande Tunnel was constructed in about 1895 and has survived many significant earthquakes. However, no detailed geotechnical or structural analysis has been carried out to

evaluate its long-term durability. The future reliability of the tunnel to deliver 170 cfs of capacity should be carefully considered.

- The existing Vista Grande Outfall Structure was constructed in about 1950. Currently, engineering evaluations are underway to determine possible life extension and associated expenditures. Several of the alternatives involve incorporating the existing outfall structure into the new structure, while keeping the existing outfall in service as long as possible. This work should be integrated with any alternative which considers using the existing outfall site.
- Options for filtration of diverted stormwater followed by groundwater recharge need further development regarding filtration technology, waste stream treatment and disposal, and recharge opportunities – location, capacity, development costs, and impacts.
- More information is needed about construction of potential storage in Westlake Park to be more certain about costs, duration, and impacts.

The environmental permitting process may require a considerable amount of time. Providing useful information to the federal and state resource agencies will facilitate a smooth permitting process. In addition, we recommend that the City consider the following recommendations.

- Minimize the number of unique environmental permit applications where possible.
- Provide a basis for the Project Team and the City to compare environmental/permitting constraints and opportunities with associated tunneling alternatives.
- Provide baseline environmental information that can be incorporated into future National Environmental Policy Act (NEPA) and California Environmental Quality Act documentation.
- Consider approaching resource agencies to bundle similar permits to expedite permitting. Several of the permit applications require similar information; preparation of the environmental evaluation should anticipate the type of information required in future permit applications.

The City may find it helpful to develop acceptance criteria to apply to those alternatives and mitigation strategies still under consideration. Draft acceptance criteria are provided below. In addition to providing the public benefits discussed above, the preferred alternative should:

- Address potential flooding from a watershed perspective.
- Preserve opportunities for addressing events in excess of the design storm event.
- Be capable of being implemented in an acceptable timeframe.
- Be capable of a phased implementation to address the different permitting challenges associated with a detention structure and an outfall tunnel.
- Be integrated with other recommended stormwater system improvements.
- Be integrated with the Daly City Outfall engineering evaluation.
- Preserve real estate opportunities for future stormwater detention expansion.

The City may also consider developing a budget-level cost estimate(s) for the few alternatives which it feels deliver the strongest public benefits. The typical estimating method would include developing semi-detailed unit costs associated with the anticipated construction work activities. This approach delivers a budget planning estimate, based on the conceptual design, which could be compared with other watershed-wide improvement and mitigation alternatives.