

Chapter 6 Alternatives to the Proposed Project

The following discussion evaluates alternatives to the proposed project and examines the potential environmental impacts associated with each alternative. Through comparison of these alternatives to the proposed project, the relative environmental advantages and disadvantages of each can be identified.

6.1 Methodology

The CEQA Guidelines Section 15126.6 requires EIRs to evaluate a range of reasonable alternatives to a project, or to the location of a project that would feasibly attain most of the basic project objectives and avoid or substantially lessen significant project impacts. The following criteria for selecting alternatives are set forth in the Guidelines:

- An EIR must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. The CEQA Guidelines require that the range of alternatives addressed in an EIR should be governed by a rule of reason. Not every conceivable alternative must be addressed, nor do infeasible alternatives need to be considered (CEQA Guidelines Section 15126.6(a)). When addressing feasibility, Section 15126.6 of the CEQA Guidelines states that factors that may be taken into account may include site suitability, economic viability, availability of infrastructure, other plans or regulatory limitations, jurisdictional boundaries, and the proponent's ability to reasonably acquire, control, or otherwise have access to an alternative site.
- The Guidelines also state that the evaluation is to focus on those alternatives capable of either avoiding or substantially lessening any significant environmental effects of the project, even if the alternative would impede, to some degree, the attainment of the project objectives, which are identified in Chapter 2 (Project Description) of this EIR, or would be more costly.
- The EIR should identify alternatives that were considered by the lead agency but were rejected as infeasible and the reasons for the lead agency's determination (Section 15126.6(c))
- A "No Project" alternative must be evaluated and the EIR must also identify an environmentally superior alternative (Section 15126.6(e))

The discussion should not consider those alternatives whose implementation is remote or speculative, and the analysis need not be presented in the same level of detail as the assessment of the proposed project.

Alternatives may take the form of no project, reduced project size, different project design, or suitable alternative project sites.

Based on the CEQA Guidelines, several factors should be considered in determining the range of alternatives to be analyzed in an EIR and the level of analytical detail that should be provided for each alternative. These factors include:

- 1) the potential for the proposed project to result in significant impacts;
- 2) the ability of alternatives to reduce or avoid the significant impacts associated with the proposed project;
- 3) the ability of the alternatives to meet the objectives of the proposed project; and
- 4) the feasibility of the alternatives.

The analysis in this EIR indicates the proposed project would result in potentially significant and unavoidable project-specific impacts with respect to short-term construction-period air quality and noise; operation of the project would result in significant unavoidable groundwater quality impacts. Thus, the

alternatives examined herein represent alternatives that could minimize or avoid the significant impacts associated with implementation of the project.

6.2 Proposed Project

The proposed project is discussed in detail in Chapter 2, Project Description. The proposed project would store up to 66,000 acre-feet of water in the Raymond Basin when imported water is readily available and extract the water during periods of drought or emergency. The project components include construction of the following:

- 1) Three new ASR wells,
- 2) FMWD Nitrate Treatment Facility,
- 3) PWP-FMWD Interconnections, and
- 4) Eastside Well Collector pipeline and centralized disinfection facilities (ammonia and chlorine facilities)

Several alternative sites for PWP-FMWD Interconnections were evaluated. The preferred Interconnection sites are to be determined during the final design phase of the project.

6.3 Project Component Alternatives

Various alternatives were considered for each component of the proposed project. These variations are described below including the reasons why some were eliminated.

PWP-FMWD Interconnection

During conceptual design, two existing PWP-FMWD interconnections and five alternatives for a new interconnection between the PWP and FMWD distribution systems were considered. The new interconnection alternatives were developed based on ability to meet flow requirements (existing pipe sizes and pressure zones), physical proximity of the two distribution systems at each alternative location, the ability to be implemented without significantly modifying PWP or FMWD operating procedures, the ability to provide operational flexibility, and secondary benefits to both agencies. The alternatives for existing and new interconnections that were evaluated are:

- Existing Linda Vista Interconnection
- Existing Caltrans Yard Interconnection
- Alternative 1a
- Alternative 1b
- Alternative 2
- Alternative 3
- Alternative 4

Conceptual design evaluation narrowed down the interconnection options based on the ability to deliver the flow required under the program and potential environmental impacts. The existing Caltrans Yard interconnection and Alternative 3 would not be hydraulically capable of meeting the flow requirements of the program; therefore, both options were determined to be infeasible. Alternative 1a was eliminated from further consideration because it required construction of greater length of pipe than Alternative 1b while providing identical delivery characterizes, and thus had greater potential for construction-period environmental impacts. Alternative 1a would not have reduced or eliminated any of the significant impacts associated with the proposed project. Alternatives 1a and Alternative 3 would not reduce or avoid

any of the significant and unavoidable impacts associated with the proposed project. Water quality, noise and air quality impacts would occur regardless of which interconnection alternatives are implemented.

None of the interconnection alternatives would be capable of meeting the flow requirements of the program alone; therefore a combination of two alternatives must be implemented. Consequently, one existing interconnection and three alternatives for a new interconnection are being evaluated (Alternatives 1b, 2, and 4) and three options for implementation are being considered:

- Existing Linda Vista and Alternative 4
- Alternative 1b and Alternative 4
- Alternative 2 and Alternative 4

Eastside Well Collector

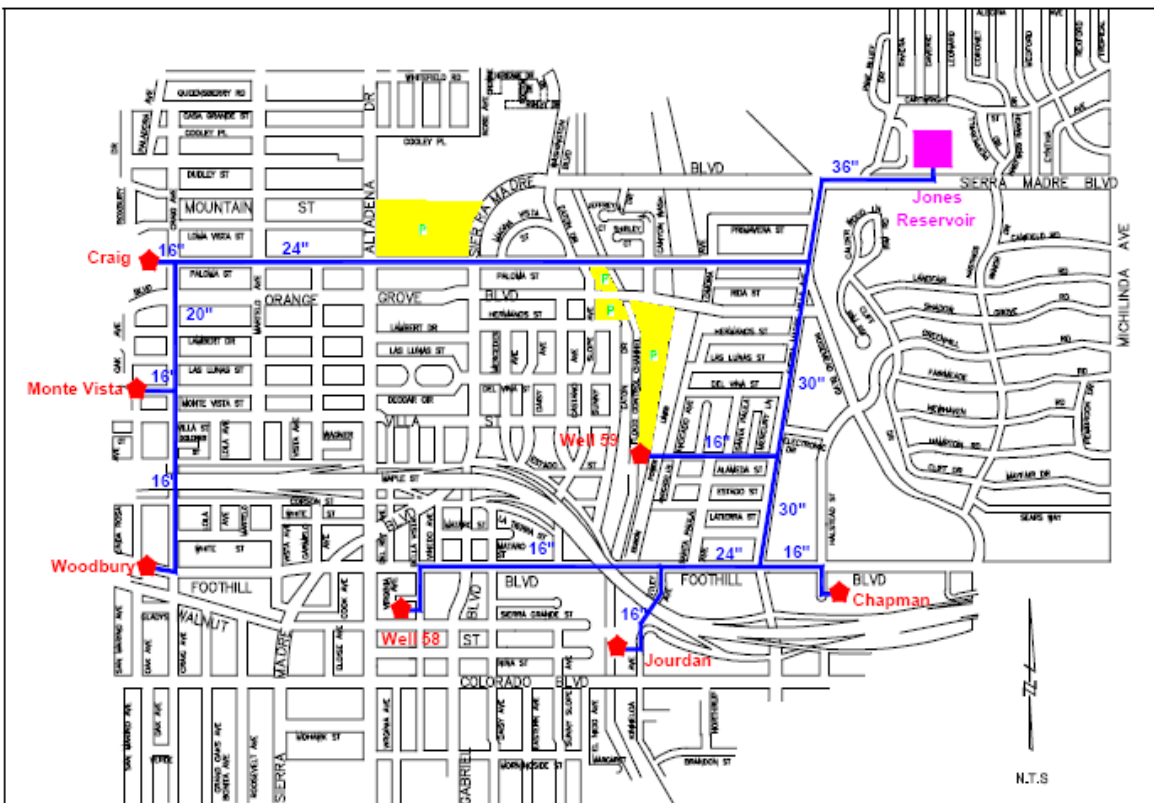
As part of the City of Pasadena *Water System Master Plan* (MWH 2002), three alternatives were evaluated for the Eastside Well Collector project and one was recommended. The recommended alternative has since been modified and is described in Chapter 2. The three proposed alternatives for the Eastside Well Collector that were evaluated in the Master Plan are:

- Alternative 1: The Eastside Well Collector would collect water from seven wells and carry the water to Jones Reservoir. This alternative would consist of approximately 30,000 feet of pipeline, ranging from 16-inch to 36-inch in diameter. In this alternative, the wells would not require modification. Chloramination of the well water would occur at Jones Reservoir. Construction of the collector would provide air release capability, which would allow operation of the existing Jourdan ASR well.
- Alternative 2: The Eastside Well Collector would connect seven wells to a new reservoir at the Well 59 (Twombly) site from which the water would be pumped into the PWP Sunset Zone using a new booster station. This alternative would consist of approximately 27,000 feet of pipeline, ranging from 16-inch to 36-inch in diameter. This alternative would also require a 500,000-gallon storage tank and a booster pump station (capacity of 12,000 gpm at 200 ft TDH) to pump water from the reservoir to the Sunset Zone. The well pumps would either need to be modified to reduce the number of pump stages or the excess water pressure would be released at the new reservoir. Chloramination of the well water would occur at the storage tank. This alternative would also allow operation of the Jourdan ASR well.
- Alternative 3: The Eastside Well Collector would not be constructed. The wells would continue to pump directly into the distribution system. Chloramination of the well water would occur at each individual well. This alternative would require the installation of chlorine and ammonia facilities throughout the City at each of the wells. Jourdan Well would not be available via this alternative due to well operational problems.

Alternatives 1 and 2 are shown in Figure 6.3-1 and Figure 6.3-2 respectively. Alternative 2 would not have avoided the significant construction-period noise impacts associated with Alternative 1. Alternative 2 includes pipeline construction similar to the proposed project, with the addition of a 500,000-gallon water storage tank and a booster pump station. Construction of these additional facilities is expected to have associated impacts that would make Alternative 2 less desirable than the proposed project from an environmental impact standpoint. Alternative 3 was not recommended because it would require the installation of chemical storage and feed facilities (chlorine and ammonia) at six well locations throughout the City. Because many of these wells are located in residential neighborhoods, this option had substantially greater potential public safety concerns than Alternatives 1 and 2. Public safety outweighs the short-term noise impacts of the project. Alternative 3 would avoid noise impacts but would not meet the project objectives.

Alternative 1 allows operation of the Jourdan Well without rehabilitation, thereby increasing PWP production capacity (which would be used for the PGSP). Therefore, it was recommended that PWP construct the Eastside Well Collector Alternative 1. The pipeline route was subsequently modified during final design to minimize the length of the pipeline and associated impacts to the public. The overall pipeline length of the proposed route is approximately 25,600 LF. While Alternative 3 would avoid the significant short-term noise impact of the project, it would not be environmentally superior to the proposed project because it would increase hazards due to the requirement for chlorine and ammonia facilities at seven well sites rather than one central location. In addition, Alternative 3 would not meet the goal of the project to enhance water supply reliability because existing problems with the Jourdan well would not be corrected.

Figure 6.3-1: Eastside Well Collector, Alternative 1



FMWD Nitrate Treatment Facility

Four alternative treatment processes for nitrate removal from groundwater at the FMWD site were considered during conceptual design. The treatment processes evaluated are readily available treatment technologies for the removal of nitrate from water.

1. Reverse Osmosis (RO)
2. Conventional Ion Exchange
3. Biological Denitrification
4. High Efficiency Ion Exchange

Reverse osmosis and conventional ion exchange technology were both determined to be infeasible due to a high volume of concentrated waste stream that would be produced during the processes. The waste stream would not be accepted by the local sewer district (LACSD) because it would not be compatible with the treatment process at the regional plant. Off-hauling and disposal of the waste stream at an acceptable facility would not be feasible due to the volume produced and the number of trucks that would be required for transport.

While biological denitrification does not generate a concentrated waste stream, it has numerous hurdles to overcome before it is accepted as a drinking water treatment technology. One technical concern is increased levels of trihalomethanes (THMs) and haloacetic acids (HAAs) formed after chlorine addition to form chloramines due to the addition of acetate in the treatment process. The higher organic content of the finished water also increases the rate of chlorine and chloramine loss in the distribution system. The potential growth of pathogenic microorganisms in the bacterial population is a regulatory concern. This concern may prompt DHS to require the use of a more aggressive disinfectant in the treated water, such as ultraviolet (UV) disinfection. Finally, public response to the idea of utilizing a biological process for producing drinking water cannot be ignored. Because this is not yet considered a proven treatment technology, the public acceptability of this option is considered questionable. For these reasons, the implementation of biological denitrification for the nitrate treatment facility is not a viable option at this time.

High efficiency ion exchange technology is considered the only feasible option for nitrate removal at the FMWD site. A detailed description of this system is provided in Chapter 2, Project Description.

Alternative Scenarios for the Program

The *Results of Predictive Groundwater Modeling for the Pasadena Groundwater Storage Program* (Geoscience 2007) presents alternative groundwater modeling scenarios which simulate groundwater conditions in the Raymond Basin over a 25-year period. Three scenarios were modeled. See Appendix C for the full report, including detailed description of each Scenario and assumptions.

Scenario 1: Baseline Conditions. This scenario represents a “No Project Alternative”. The model simulation represents existing conditions and incorporates unrelated projects that are expected to be implemented before or shortly after the start of the PGSP.

Scenario 2: Proposed Project with the Jones Well. This scenario represents a project that includes the components being proposed and an additional well at the Jones Reservoir (Hamilton Park Site) in Pasadena. The overall program would operate as described herein, with the exception that the proposed ASR well injection and extraction capacity would be divided among four new wells rather than the proposed three new wells. This Scenario was the original project, however, it was determined during groundwater modeling and hydrogeological evaluation that the well at Jones Reservoir was not beneficial to the program, and a new scenario was developed without this well (Scenario 3).

Scenario 3: Proposed Project. This scenario represents the project as described in Chapter 2, Project Description.

See Appendix C for full results and comparisons of the model simulations, including predicted groundwater levels and water budgets.

Scenario 2 and 3 would have similar impacts; however, Scenario 2 would require an additional ASR well at Jones Reservoir. The additional well would have similar impacts as those described for the proposed ASR wells at McDonald Park and Victory Park. Scenario 1 would have no impacts.

6.4 Reduced Storage Alternative

Reduced Storage Program

A “reduced storage” alternative eliminating the new McDonald and Victory Park ASR wells has been evaluated. The amount of water that could be stored would be limited by PWP’s extraction capacity using existing wells and the new Craig ASR well. Under this alternative, PWP would store a maximum of approximately 13,425 AFY during a full put year, and extract 17,900 AFY during a take year. This reduced program would result in an overall volume of approximately 53,700 AF of water stored per PGSP cycle. This alternative would eliminate impacts associated with the construction and operation of the McDonald Park and Victory Park wells. The FMWD Nitrate Treatment System, PWP-FMWD Interconnection and Eastside Well Collector would still be required to treat Valley Water Company and La Cañada Irrigation District groundwater to acceptable nitrate levels, to provide means to transfer water from Pasadena Water and Power to Foothill Municipal Water District and to provide a means to re-Jourdan well and provide a means for centralized treatment of PWP Eastside wells.

Under the reduced storage alternative, PWP’s maximum in-lieu recharge volume would remain the same as the proposed project. Injection capacity would not be a limiting factor based on existing and new injection capacity provided by the proposed Craig well. The amount of injection would decrease based on the limitation of PWP’s extraction capacity and the amount that could be withdrawn.

Although the reduced storage alternative would eliminate the McDonald Park and Victory Park wells and resultant environmental impacts, the local and regional benefits to water supply reliability would be significantly reduced and no significant impacts would be eliminated. Due to the climate and population of Southern California, available water supplies must be utilized as efficiently as possible to meet existing and future water needs. The reliability of water supply in the region is constantly in question and natural disasters such as a long-term drought or earthquake causing significant interruption of MWD supplies are likely scenarios given the regional conditions. Conjunctive use must be maximized to the fullest extent possible to ensure water supply reliability. Under severe and continuing drought conditions, insufficient water may be stored in the basin to meet local water needs potentially resulting in increased impacts to surrounding wells resulting from significantly decreased groundwater elevations or increased potential for basin overdraft conditions.

6.5 No Project Alternative

CEQA Guidelines Section 15126.6(e)(3)(B) requires a comparison of the environmental effects of maintaining the project area in its existing state against the environmental effects that would occur if the project would proceed. Under the No Project Alternative, the proposed PGSP would not be implemented. Construction of the ASR wells, FMWD Nitrate Treatment Facility, PWP-FMWD Interconnection, and the Eastside Well Collector pipeline and centralized disinfection system would not occur. None of the short-term construction impacts or long-term operational impacts described in Chapter 3 of this DEIR would occur. Short-term noise and air quality impacts associated with construction would not occur. Operational groundwater quality impacts would also be eliminated. Removal of these project effects would also reduce or eliminate cumulative impacts to the project area that would have resulted when combined with other project affects in the area (as described in Chapter 5).

CEQA Guidelines Section 15126.6(e)(3)(B) also requires discussion of the practical effects of not proceeding with the project. As described above under the reduced storage alternative, potential impacts under the No Project alternative may include impacts to surrounding wells resulting from decreased groundwater levels and, in periods of sustained and severe drought, potential basin overdraft. Additionally, the benefits of the proposed program associated with providing water supply reliability in the region, as well as all secondary local benefits, would not be reached if the No Project alternative is carried through.

6.6 Comparison of Environmental Effects

The alternatives determined to be reasonable and feasible must also be analyzed to determine if their significant impacts can be substantially reduced or avoided. This section provides an analysis of the environmental impacts of the alternative to the proposed project, as well as the impacts that would result from implementation of the No Project Alternative. Table 6-1 compares the environmental effects of the alternatives to the proposed project.

The No Project alternative must be analyzed pursuant to Section 15126.6(e) of the CEQA Guidelines to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. The second alternative analyzes a reduced project. The alternatives were selected because of their potential to substantially lessen one or more significant impacts of the project.

Table 6-1: Description of Project Alternatives

Alternative	Impacts
Proposed Project – Pasadena Groundwater Storage Program	
Project Elements <ul style="list-style-type: none"> • 25,600 LF feet of pipeline • Centralized Ammonia and Chlorination Facilities • 3 ASR wells • Nitrate Treatment Facility • PWP-FMWD Interconnections 	The proposed project combined project elements that produce less environmental impact than other alternative scenarios (i.e. nitrate treatment method, different well collector alignments, interconnection locations, number of ASR wells, etc). Construction impacts include significant and unavoidable impacts to air quality and noise. Long-term operational impacts that are significant and unavoidable are limited to water quality impacts.
Alternative 2 - Reduced Storage Program	
Project Elements Reducing pumping – no new infrastructure at McDonald Park or Victory Park. All other infrastructure is the same as the Proposed Project.	Impacts due to construction and operation of the McDonald Park and Victory Park ASR wells would be eliminated. All other impacts, including significant and unavoidable impacts, would remain the same. This alternative would not meet the goals of the program.
No Project Alternative	
Project Elements No new infrastructure	The No Project Alternative would maintain the existing Pasadena Long-term Storage in the Raymond Basin but no new infrastructure would be constructed. Therefore, no construction impacts would occur. Impacts to water quality and hydrology from continued long-term storage in the basin at current levels would be less than the proposed project for all impacts except potential overdraft impacts and impacts to surrounding wells which may increase due to decreased groundwater elevations (especially in drought years).

Table 6-2: Comparison of Project Alternatives Impacts

Impact	Proposed Project	No Project	Reduced Project
Aesthetics			
Impact AES-1: Temporary visual impacts at the project sites	Less than Significant	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant. While the McDonald Park and Victory Park ASR wells would not be constructed, and thus no impacts would occur at those sites, temporary visual impacts would still occur at the other project sites at a less than significant level.
Impact AES-2: Temporary source of substantial light or glare would adversely affect day or nighttime views in the area	Less than Significant	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant. While the McDonald Park and Victory Park ASR wells would not be constructed, and thus no impacts would occur at those sites, temporary source of substantial light or glare would still occur at the other project sites at a less than significant level.
Impact AES-3: Project implementation would cause substantial degradation to the existing visual character or quality of the area and the visual quality of McDonald Park	Less than Significant with Mitigation Incorporated	No Impact. There would be no project implementation.	Less than Significant with Mitigation Incorporated. While the McDonald Park and Victory Park ASR wells would not be constructed, and thus no impacts would occur at those sites, mitigation measure AES-1-3 Tree Planting would still be required to mitigate potential impacts from the nitrate treatment facility.
Impact AES-4: Project implementation would create a new source of substantial light or glare which would adversely affect day or nighttime views in the area	Less than Significant with Mitigation Incorporated	No Impact. There would be no project implementation.	Less than Significant with Mitigation Incorporated. Lighting on the exterior of the buildings at the nitrate treatment facility site would be limited to standard door well lights which would be set on timers or remain off at night. Glare resistant surfaces would be used on buildings.
Impact AES-5. Project implementation would cause an adverse effect on a scenic vista and scenic resources	No Impact	No Impact. There would be no project implementation.	No Impact. The reduced project would not be constructed along a state scenic highway.

Air Quality			
Impact AQ-1: Regional Construction Impacts	Significant and Unavoidable	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Significant and Unavoidable. Most NO _x emissions result from the Eastside Well Collector. Minor reductions in NO _x emissions are possible because there would be fewer wells, however there would still be a significant and unavoidable impact. Mitigation measures AQ-1-1 through AQ-1-5 would be implemented.
Impact AQ-2: Local Construction Impacts	Significant and Unavoidable	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Significant and Unavoidable. Most NO _x emissions result from the Eastside Well Collector. Minor reductions in NO _x emissions are possible because there would be fewer wells, however there would still be a significant and unavoidable impact. Mitigation measures AQ-2-1 through AQ-2-8, along with measures AQ-1-1 through AQ-1-5 would be implemented.
Impact AQ-3: Toxic Air Contaminants	Less than Significant	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant. The reduced project would not result in either a long-term or substantial source of TAC emissions or corresponding individual cancer risk due to the limited construction period of less than two years.
Impact AQ-4: Odor	Less than Significant	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant. The reduced project would require similar construction activities and few pieces of diesel power equipment operating simultaneously.
Impact AQ-5: Regional Operational Impacts	Less than Significant	No Impact. There would be no long-term project operation.	Less than Significant. Operational emissions from the reduced project would not exceed the SCAQMD's thresholds.
Impact AQ-6: Local Operational Impacts	Less than Significant	No Impact. There would be no long-term project operation.	Less than Significant. The increases in traffic congestion associated with the reduced project would not significantly contribute to congestion.
Impact AQ-7: Toxic Air Contaminant Impacts	Less than Significant	No Impact. There would be no long-term project operation.	Less than Significant. The reduced project does not include installation of diesel-powered generators.

Impact AQ-8: Odor	No Impact	No Impact. There would be no long-term project operation.	No Impact. Use of aqua ammonia an chlorine gas are designed to be closed loop systems and thus no routine emission of these compound is expected as a result of the reduced project.
Biological Resources			
Impact BIO-1: Native Plant Communities	Less than Significant	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant. The PWP-FMWD Interconnection Alternative 1b supports a remnant native plant community. Minimal impacts may occur, however no trees would be removed and the impact would not substantially affect the regional distribution of coast live oak woodlands.
Impact BIO-2: Wildlife Movement	No Impact	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	No Impact. No regional wildlife corridors occur within the reduced project component areas.
Impact BIO-3: Jurisdictional Features	Less than Significant with Mitigation Incorporated	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant with Mitigation Incorporated. Construction of the interconnection alternative 1b may temporarily impact the concrete-lined roadside ditch during construction, but mitigation would be incorporated to avoid water quality impacts.
Impact BIO-4: Sensitive Biological Resources	Less than Significant	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant. Several sensitive wildlife species were reported by the USFWS and in the CNDDDB from the region. Project implementation would not threaten regional populations of these species.
Impact BIO-5: Nesting Birds	Less than Significant with Mitigation Incorporated	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant with Mitigation Incorporated. Project component sites support native and non-native trees and other vegetation that has the potential to support nesting birds. Mitigation measure BIO-5 would be implemented.
Impact BIO-6: Regulated Trees-Pasadena	Less than Significant with Mitigation Incorporated	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur	Less than Significant with Mitigation Incorporated. A number of native and non-native trees occur within the project component sites and may be impacted during project implementation. Mitigation measure BIO-6 would be implemented.

Impact BIO-7: Regulated Trees-La Cañada Flintridge	Less than Significant with Mitigation Incorporated	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant with Mitigation Incorporated. A number of non-native trees occur within the project components site and may be impacted during project implementation. Mitigation measure BIO-7 would be implemented.
Cultural Resources			
Impact CR-1: Historic Resources	Less than Significant with Mitigation Incorporated	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant. There would be no ASR wells at McDonald Park and Victory Park.
Impact CR-2: Archaeological Remains	Less than Significant with Mitigation Incorporated	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant with Mitigation Incorporated. The project site is located in a highly urbanized area with most facilities and corridors under pavement. Any accidental discovery of cultural resources during construction will be evaluated by a qualified archeologist.
Impact CR-3: Paleontological Resources	Less than Significant with Mitigation Incorporated	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant with Mitigation Incorporated. Project activities are not expected to disturb, damage, or degrade potential paleontological resources, but a qualified paleontologist would address any accidental discoveries.
Impact CR-4: Human Remains	Less than Significant	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant. Results of the cultural resources records search did not indicate the presence of known burials or Native American cultural resources within the project site or within a quarter-mile radius of the project site. If human remains are encountered during construction excavation and/or grading activities at any project component location, all work shall cease.
Geology and Soils			
Impact GEO-1: Increase in erosion	Less than Significant with Mitigation Incorporated	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant with Mitigation Incorporated. Construction could result in the short-term increase of erosion as ground is disturbed and vegetation is removed. Mitigation measure HWQ-1-1 would be implemented.

<p>Impact GEO-2: Threat to workers from seismically-induced landslide</p>	<p>Less than Significant with Mitigation Incorporated</p>	<p>No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.</p>	<p>Less than Significant with Mitigation Incorporated. Portions of PWP-FMD Interconnection Alternative 1b are located within an area that has historically seen landslide movement induced by ground-shaking. Mitigation measure GEO-2 would be implemented.</p>
<p>Impact GEO-3: Infrastructure damage from fault displacement and ground-shaking</p>	<p>Less than Significant with Mitigation Incorporated</p>	<p>No Impact. There would be no long-term project operation.</p>	<p>Less than Significant with Mitigation Incorporated. Unless constructed to withstand the potential shaking caused by an earthquake, Craig ASR well building and nitrate treatment facilities could collapse or be shifted off their foundations and pipelines and well casings could be damaged. Mitigation measure GEO-3 would be implemented.</p>
<p>Impact GEO-4: Infrastructure damage from liquefaction and/or seismically-induced landslides</p>	<p>Less than Significant with Mitigation Incorporated</p>	<p>No Impact. There would be no long-term project operation.</p>	<p>Less than Significant with Mitigation Incorporated. Portions of PWP-FMWD Interconnection Alternative 1b and 2 and the Eastside Well Collector pipeline are located within mapped Seismic Hazard Areas. Mitigation measure GEO-4 would be implemented.</p>
<p>Hazards and Hazardous Materials</p>			
<p>Impact HAZ-1: Exposure during construction</p>	<p>Less than Significant with Mitigation Incorporated</p>	<p>No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.</p>	<p>Less than Significant with Mitigation Incorporated. Construction activities could result in exposure of employees and the public to common construction site hazardous materials, and exposure to chemicals either through reported releases near construction sites or unreported releases of hazardous substances. Mitigation measures HAZ-1-1, HWQ-1-1 and HWQ-1-2 would be implemented.</p>
<p>Impact HAZ-2: Use of hazardous materials within one quarter-mile of sensitive receptors</p>	<p>Less than Significant with Mitigation Incorporated</p>	<p>No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.</p>	<p>Less than Significant with Mitigation Incorporated. Due to the construction zone's vicinity to several schools, construction activities may result in the release of hazardous materials within one quarter-mile of schools. Mitigation measures HWQ-1-1 and HWQ-1-2 would be implemented.</p>

Impact HAZ-3: Creation of a hazard through routine storage and use of hazardous materials or accidental release	Less than Significant with Mitigation Incorporated	No Impact. There would be no long-term project operation.	Less than Significant with Mitigation Incorporated. Sites that would require the storage and use of hazardous materials include the FMWD Nitrate Treatment Facility, Eastside Well Collector and Craig ASR well site. Mitigation measures HAZ-3-1 and HAZ-3-2 would be implemented.
Hydrology and Water Quality			
Impact HWQ-1: Degradation of Water Quality Resulting From Construction Runoff	Less than Significant with Mitigation Incorporated	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant with Mitigation Incorporated. Construction and installation of pipelines, water treatment facilities, and support structures would require site clearing, grading and excavation which could result in soil erosion, soil conveyance, and transportation of other construction-related contaminants to nearby receiving waters. Mitigation measures HWQ-1-1 and HWQ-1-2 would be implemented.
Impact HWQ-2: Potential Impacts on Groundwater or Surface Water Quality from Recharge and/or Recovery Operations	Significant and Unavoidable	Significant and Unavoidable. No ASR wells would be constructed to assist in the stabilization of groundwater levels. Potential would exist for long-term impacts on Raymond Basin water levels.	Significant and Unavoidable. Recharge and/ recovery operations would still occur under the reduced project alternative. Thus, the impact would remain the same. Mitigation measures HWQ-2-1 and HWQ-2-2 would be implemented.
Impact HWQ-3: Depletion of Groundwater Supplies within the Raymond Basin	No Impact	Significant and Unavoidable. No ASR wells would be constructed to assist in the stabilization of groundwater levels. Potential would exist for long-term impacts on Raymond Basin water levels.	No Impact. At no time will PWP be allowed to withdraw water in excess of the net amount documented by the RBMB to be in the long-term-storage account.
Impact HWQ-4: Long-Term Changes in Raymond Basin Groundwater Levels	Less than Significant with Mitigation Incorporated	Significant and Unavoidable. No ASR wells would be constructed to assist in the stabilization of groundwater levels. Potential would exist for long-term impacts on Raymond Basin water levels.	Less than Significant with Mitigation Incorporated. This impact would remain the same under the reduced project alternative. Based on modeling results, groundwater levels are generally considered to rise, therefore impacts to nearby well users from declining groundwater levels are considered low. Mitigation measures HWQ -2-1 and HWQ-2-2 would be implemented.

Impact HWQ-5: Substantial Impacts on Surrounding Groundwater Wells Attributable to Recharge and/or Recovery Operations	Less than Significant with Mitigation Incorporated	No Impact. There would be no long-term project operation.	Less than Significant with Mitigation Incorporated. The reduced project could result in a temporary lowering of the local groundwater table. Mitigation measures HWQ -2-1 and HWQ-2-2 would be implemented.
Impact HWQ-6: Substantially Alter the Existing Drainage Pattern or Contribute to Existing Local or Regional Flooding	Less than Significant with Mitigation Incorporated	No Impact. There would be no long-term project operation.	Less than Significant with Mitigation Incorporated. Replacement of the Craig well or work on the pipeline would result in an impact that is less than significant with mitigation incorporated. Existing land contours would be replaced following construction to prevent flooding.
Impact HWQ-7: Pressurization along local faults	Less than Significant	No Impact. There would be no long-term project operation.	Less than Significant. This impact would remain the same under the reduced project alternative, as injection would still occur.
Land Use			
Impact LU-1: Short-term disturbance of activities and impaired access to adjacent land uses	Less than Significant	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant. Construction of the PWP-FMWD Interconnection and the Eastside Well Collector pipeline would generate temporary noise, dust, vibration, traffic and street access problems that could disrupt land uses. Mitigation measure LU-1 would be implemented.
Impact LU-2: Acquisition or lease of property from landowners, organizations, or local agencies	No Impact	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	No Impact. No land acquisition would be necessary.
Impact LU-3: Temporary adverse impact on recreation opportunities within the project area	Less than Significant with Mitigation Incorporated	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant with Mitigation Incorporated. PWP-FMWD Interconnection Alternative 1b would disturb a parking area and a road used for recreation and Alternative 2 would disturb the Rose Bowl "track". Mitigation measures LU-3-2, TRA-2, TRA-3, CR-1-1 and CR-1-2 would be implemented.

Impact LU-4: Temporary obstruction of park entrances by construction activities	Less than Significant	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant. Construction of the PWP-FMWD Interconnection and the Eastside Well Collector pipeline would potentially obstruct street entrances to parks. Mitigation measures LU-3-1 and LU-3-2 would be implemented.
Impact LU-5: Long-term disturbance of activities and impaired access to adjacent land uses at project sites	Less than Significant with Mitigation Incorporated	No Impact. There would be no long-term project operation.	No Impact. Construction of the PWP-FMWD Interconnection, Eastside Well Collector, FMWD Nitrate Treatment Facility, and Craig ASR well are not expected to result in any long-term land use incompatibilities.
Impact LU-6: Physically divide an established community	No Impact	No Impact. There would be no long-term project operation.	No Impact. The reduced project components are spread out across the City of Pasadena and one site is located in La Cañada Flintridge and would not divide any communities.
Impact LU-7: Conflict with any applicable land use plans, policies, or regulations or any applicable habitat conservation plan or natural community conservation plan	No Impact	No Impact. There would be no long-term project operation.	No Impact. The reduced project would not conflict with any applicable land use plans, policies, or regulations or any applicable HCPs or natural community conservation plans.
Impact LU-8: Project implementation would cause an adverse effect on the recreational quality of McDonald Park	Less than Significant with Mitigation Incorporated	No Impact. There would be no project implementation.	No Impact. The McDonald Park ASR well would not be constructed.
Impact LU-9: Increase in the use of recreational facilities or need for new facilities	No Impact	No Impact. There would be no long-term project operation.	No Impact. The reduced project would not increase the use of recreational facilities or result in the need for new facilities.
Noise			
Impact NOI-1: Noise Generated During Construction	Significant and Unavoidable	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Significant and Unavoidable. The reduced project components would result in noise generated during construction. Mitigation measures NOI-1-1 through NOI-1-5 would be implemented.

Impact NOI-2: Vibration Generated During Construction	Less than Significant with Mitigation Incorporated	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant with Mitigation Incorporated. Construction of the Craig ASR well and pipelines is anticipated to generate ground vibration typical of the construction equipment and process. Mitigation measure NOI-2 would be implemented.
Impact NOI-3: Long-Term Noise Generated due to Project Operation	Less than Significant with Mitigation Incorporated	No Impact. There would be no long-term project operation.	Less than Significant with Mitigation Incorporated. Operation of the Craig ASR well and the nitrate facility would result in noise impacts. Mitigation measure NOI-3 would be implemented.
Public Services and Utilities			
Impact PS-1: Temporary disruption of utilities and service	Less than Significant with Mitigation Incorporated	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant with Mitigation Incorporated. Construction of the Craig ASR well and pipelines could conflict with existing utilities. Mitigation measures PS-1-1 and PS-1-2 would be implemented.
Impact PS-2: Project implementation would cause an increase in the need for law enforcement services	No Impact	No Impact. There would be no project implementation.	No Impact. The reduced project would not cause an increased need for law enforcement, police protection, and other public services.
Impact PS-3: Increased demand for electricity	Less than Significant	No Impact. There would be no long-term project operation.	Less than Significant. PWP and Southern California Edison have the capacity to meet the additional demands.
Impact PS-4: Increased discharge to storm drains and sewers, and increased waste generation	Less than Significant with Mitigation Incorporated	No Impact. There would be no long-term project operation.	Less than Significant with Mitigation Incorporated. The operation of the proposed Craig ASR well would generate a new sources of water discharged to existing storm drains during periods of flushing. Mitigation measure PS-4 would be implemented.
Traffic			
Impact TRA-1: Construction Safety	Less than Significant with Mitigation Incorporated	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur	Less than Significant with Mitigation Incorporated. The PWP-FMWD Interconnection and the Eastside Well Collector pipeline would result in impacts to pedestrians, bicyclists, and motorized traffic. Mitigation measures TRA-1-1 through TRA 1-6 would be implemented.

Impact TRA-2: Access	Less than Significant with Mitigation Incorporated	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant with Mitigation Incorporated. Construction of the connecting pipelines from the Craig ASR well site for water supply and stormwater drainage would temporarily restrict access to driveways and garages through Dunham Alley to neighboring residents. Mitigation measures TRA 1-1 and TRA-1-6 would be implemented.
Impact TRA-3: Parking	Less than Significant with Mitigation Incorporated	No Impact. Under the No Project alternative no construction would occur and thus no temporary impacts would occur.	Less than Significant with Mitigation Incorporated. Construction of the PWP-FMWD Interconnection and the Eastside Well Collector would result in impacts to parking. Mitigation measures TRA 1-1 and TRA-1-6 would be implemented.

6.7 Identification of the Environmentally Superior Alternative

The City has identified the No Project Alternative as the Environmentally Superior Alternative. However, CEQA guidelines Section 15126.6(e)(2) requires that an EIR also identify an environmentally superior alternative from among the project alternatives. Accordingly, the City has identified the proposed project as the environmentally superior alternative because the reduced project does not eliminate any significant and unavoidable impacts, and the proposed project provides greater benefits to water supply. This designation is based on the analysis of environmental effects in Section 6.6. For the PWP-FMWD Interconnection component of the proposed project the combination of Alternative 2 and Alternative 4 has been identified as the environmentally superior alternative.

6.8 Other Alternatives Considered but Rejected

CEQA Guidelines Section 15126.6(c) requires that an EIR identify alternatives that were considered by the lead agency but rejected as infeasible. During the conceptual design and scoping process for the PGSP, other conceptual alternatives were identified, but are not further evaluated in this EIR because of infeasibility or inability to avoid significant environmental impacts as described in the following sections.

6.8.1 Existing Spreading Basins for Storage of MWD Water

Previous studies, including the *Baseline Groundwater Assessment of the Raymond Basin* (Geoscience 2004) examined the use of existing spreading grounds for groundwater recharge for conjunctive use. There is one existing spreading basin located within the Pasadena subarea of the Raymond Basin, the Eaton Wash spreading grounds. PWP currently receives spreading credits (increase in Raymond Basin pumping rights) for a portion of surface water that is diverted to the spreading grounds. Geoscience estimated that the recharge capacity of Eaton Wash spreading grounds could be 17,033 acre-feet per year with an optimal maintenance program to prevent clogging of the basin (Geoscience 2004).

The required infrastructure is in place to deliver and spread imported water at the Eaton Wash grounds and the facilities could be used for storage under the PGSP. However, the use of Eaton Wash spreading grounds for storage of imported water is not being relied upon for operation of the program because the spreading grounds are currently used for flood control and spreading of surface water. These operations would continue throughout the life of the program and would vary the availability of the grounds for storage of imported water. The spreading grounds would be considered for storage of imported water in conjunction with or in lieu of the ASR wells based on PWP operational and seasonal conditions during a put year.

6.8.2 New Spreading Basins for Storage of MWD Water

Previous studies have examined the use of new spreading basins for storage of imported MWD water in the Raymond Basin. However, spreading basins require a large amount of land, which is not available in the urbanized setting of Pasadena. This alternative is not considered feasible pursuant to CEQA Guidelines 15126.6(f)(1). There is no available suitable site for new spreading basins.

6.8.3 Separate Injection and Extraction Wells

The use of separate injection and extraction wells in lieu of ASR wells will not be evaluated as more well sites would be required (three injection wells and three extraction wells) to store and produce the flow rates identified. Suitable well sites are difficult to identify in the project area and more wells would increase construction cost and environmental impacts. This alternative would significantly increase environmental impacts and thus was not evaluated as a feasible project alternative.

6.9 References

Geoscience, 2004. *Baseline Groundwater Assessment of the Raymond Basin*, Final Report, prepared for the Raymond Basin Management Board, Geoscience Support Services, Inc, February 2, 2004.

Geoscience, 2007. *Results of Predictive Groundwater Modeling for the Pasadena Groundwater Storage Program*, prepared for the Raymond Basin Management Board, Geoscience Support Services, Inc., January 31, 2007.

MWH, 2002. *City of Pasadena Water System Master Plan*, prepared for Pasadena Water and Power, MWH, 2002.