



SAN JOSE OFFICE
1570 Oakland Road, Suite 200
San Jose, CA 95131
Phone: (408) 487-2200
Facsimile: (408) 487-2222
www.hmh-engineers.com

TECHNICAL MEMORANDUM

DATE: August 24, 2004

JOB NO: 3200-00-001

SUBJECT: PRELIMINARY FACILITIES AND COST ANALYSIS FOR THE CVSP
COMPOSITE CORE CONCEPTUAL PLAN

PURPOSE

The purpose of this technical memorandum is to outline the process to date, and to summarize the Preliminary Facility Systems Analysis and Engineers Estimate of Probable Construction Costs for the Composite Core Infrastructure associated with the Conceptual Plan for the Coyote Valley Specific Plan. **The estimated cost ranges included herein are preliminary and are subject to change based upon reviews by the City of San Jose and other affected agencies.**

Constraints Analysis

The development of the Facility Systems Analysis began roughly one year ago with the physical constraints analysis. The objective was to determine the key issues and constraints for each system and/or facility based upon existing conditions and planned facilities in the region. In general, all available record information was compiled and mapped, and field reviews were conducted to check the extent and locations of each of the systems. Some of the field reviews included the participation of staff from the agencies that own and maintain the facilities. This was especially useful in identifying and confirming the constraints at well.

Design Criteria

The next step involved the development and identification of relevant design criteria, standards and guidelines for each facility described herein. This was done to establish a starting point of reference for all future technical reviews and analysis. The basis for the Design Criteria was included in the Constraints Analysis and was reviewed with each of the participating agencies to obtain concurrence with the criteria prior to finalization. This design criteria was then tested against each system to identify the physical and technical constraints posed by the existing conditions. For some of the major components, specific models were developed to test these systems and to aid in the identification of the systems limitations. The design criteria developed during this phase became the foundation for developing the conceptual plans for each of the systems, which are included in this report.

Composite Core Analysis

During this phase each of the systems were tested in a similar fashion to the analysis that was conducted during the Constraints Analysis. However, during this phase Technical Memoranda or Facility Analysis Data Sheets were developed for each facility that comprise the core infrastructure. These Technical Memoranda include a background narrative and general description of the technical plan for the facility. Facility objectives are outlined, followed by identification of specific facility components and their functions. Conceptual technical plans were prepared for each system and were used to produce specific cost estimates for each facility. Cost assumptions and total estimated construction costs for each facility are stated in the facility cost basis section of the technical report. The facility analysis process generated a list of technical issues and design criteria that could affect the Plan. The analysis included research and identification of regulatory issues and permits influenced by the design. The technical reports also touch on potential environmental issues that should be considered as the Plan develops. Since the initial Composite Core Plan was developed, these Technical Memoranda have been utilized in focused workshops and coordination meetings with the consultant team and various affected agencies. The intent is to update the Facility Analysis document and its associated plans and details following each successive plan iteration so that these documents become more precise as the Specific Plan is developed.

Preliminary Engineers Estimate of Probable Construction Costs

For each facility that comprises the Core infrastructure, an Estimate of Probable Construction Costs was developed. The components listed in the Technical Memorandum described previously are included in the estimate and became the foundation for which each of the estimates was developed. The estimates are categorized by standard major components with specialty items listed separately. Factors have been included for minor and supplemental work. This estimate does not include land and easement acquisition costs, soft costs, or habitat preservation or mitigation costs. As in all engineer's estimates, a contingency factor has been applied that reflects the level of development and/or precision of the plans. Due to the fact that we are in the early stages of development of the Specific Plan and the plan is still in concept form, a contingency factor of 25% has been incorporated to cover unforeseen issues. With each successive update of the Specific Plan the cost analyses would be updated as well. As the plan develops and becomes more precise, the contingency factor would be reduced.

Regional Facilities

At this stage in the process, we have begun discussion regarding the identification of regional facilities that are extraordinary in nature, which would support or serve a greater area than the Coyote Valley Specific Plan. An example to consider is the Coyote Valley Research Park project, which initially had approximately \$40.5 million in funding appropriated from various public agency sources. Similarly, as this Plan develops, we would seek to identify potential funding sources for these extraordinary or regional facilities. We would also seek to identify other sources of funds that may apply to this project.

SUMMARY OF FINDINGS

The following is a summary of the descriptions, objectives, components and estimates of probable construction cost ranges found in each Technical Memorandum for the facilities included in the Facility Systems Analysis.

1.0 TRANSPORTATION

1.1 Interchanges

1.1.1 U.S. 101/Coyote Valley Parkway Interchange

A full interchange to U.S. 101 has been planned at a location about 0.9 miles north of Bailey Avenue in conjunction with North Coyote Valley Campus Industrial Area planning since the 1980's. This new interchange would serve as the major gateway to the northern portion of the site. The planned Interchange would include an undercrossing structure with a compact diamond configuration on the west side of U.S. 101 and a diagonal off-ramp and a loop on-ramp on the east side of U.S. 101. The planned interchange would relocate a portion of Malech Road, but Malech Road would not have a direct connection to the interchange. The planned freeway undercrossing would provide two (2) lanes of traffic in each direction along Coyote Valley Parkway.

Based upon the technical analysis performed, the estimated total construction costs for this interchange range from \$28,500,000 to \$37,500,000.

1.1.2 U.S. 101/Coyote Creek Golf Drive Interchange

The existing interchange is a spread diamond interchange with an undercrossing structure that connects U.S. 101 to Coyote Creek Golf Drive on the west side and to the landfill site on the east side of U.S. 101. The proposed modification would expand this Interchange to serve as a major gateway to the site. The planned improvements would modify the existing configuration into a partial cloverleaf by adding on-ramp loops for the eastbound to northbound and westbound to southbound movements. The planned modification would include widening the existing structure on both sides and is completely within the Caltrans right-of-way. The planned modification would increase the traffic capacity of the existing interchange by widening the off-ramps and adding on-ramp loops. The modifications would also widen the Coyote Creek Golf Drive under the freeway to include two (2) lanes in each direction.

The estimated construction cost range for this interchange is \$14,250,000 to \$18,750,000.

1.1.3 Modify U.S. 101/Bailey Avenue Interchange to Widen Northbound Offramp

The U.S. 101/Bailey Avenue interchange currently under construction has been planned for two additional improvements to maximize its capacity. When the interchange was approved by Caltrans in 2000, future traffic projections identified the potential need for a two-lane northbound off-ramp and a three-lane southbound on-ramp, which includes two mixed flow lanes plus an HOV bypass lane behind the ramp meter. Since these lanes were not

required for the Coyote Valley Research Park project, it was agreed that the grading for the widened northbound off-ramp would be constructed initially, and the additional lane and the required auxiliary lane prior to the exit would be deferred. For the southbound on-ramp the pavement is constructed wide enough to accommodate three lanes but initially striped for two lanes. Approaching the northbound two-lane exit, an auxiliary lane would be constructed, along with retaining walls to minimize grading and avoid right-of-way acquisition. The existing southbound on-ramp would be re-striped to three lanes and minor modifications made to the ramp meters. These improvements should be completed to maximize the capacity of the interchange and balance flows among the three major freeway access points to the Valley.

Estimated probable construction costs range between \$1,900,000 and \$2,500,000 for this interchange modification.

1.2 Regional Transit System

1.2.1 Multi-modal Train Station

The multi-modal Station would serve as the transportation hub of the Valley and connection point to other regional transportation systems. It would interface local intra-community transit with regular Caltrain service north to San Jose, the Peninsula and San Francisco as well as south to Morgan Hill, Gilroy and potential extensions to Salinas or Monterey.

Station facilities could include transit drop-off areas, structured parking, a pedestrian over-crossing, restrooms and waiting areas with opportunities for commercial convenience vendors.

Based upon the facility analysis, total construction costs for the multi-modal train station range from \$14,250,000 to \$18,750,000.

1.2.2 Caltrain Double Trackage

The Peninsula Corridor Joint Powers Board (PCJPB) owns the rail right-of-way from San Francisco to San Jose and trackage rights to Gilroy, with an option to acquire half the right-of-way in the future. Union Pacific Railroad retains rights to operate freight service in the corridor.

To accommodate the Station, the existing facility needs to be expanded from single track to double track for about 1½ miles. The existing double track, which ends near the Old Coyote town, would be extended through the multi-modal station. South of the multi-modal station it would converge back to a single-track configuration.

The estimated probable construction costs for the caltrain double trackage range between \$7,600,000 and \$10,000,000.

1.3 Intra-Community Transit System

1.3.1 Transit System

A key element of the Coyote Valley Plan is an effective transit system to interconnect the mix of housing, business and retail land uses and provide ties to other regional transit systems. The proposed in-valley “spoke” system features rubber-tired vehicles operating in dedicated street medians or separate right-of-ways with stops at closely spaced station platforms and a multi-modal terminal connecting with Caltrain. The system includes approximately 30,000 linear feet of transit corridor with up to 20 side or center platform stations. The guideway would be 28 feet wide concrete pavement with raised curbs and landscaped islands adjacent to traffic lanes. This system allows great flexibility, can easily be implemented in increments, and retains the opportunity to be converted to a rail transit guideway if desired in the future.

Based upon preliminary analysis, the range of estimated total construction costs for the transit system vary between \$29,450,000 and \$38,750,000.

1.3.2 Transit Platforms and Shelters

The planned stations would serve as on-load/off-load connectors for the living and working community. They would include one and two sided platforms with shelters. They would be placed within a 1500-foot walking radius of neighborhoods. Their exact location would be determined and agreed upon with Valley Transportation Authority (VTA) at a later stage.

Estimated probable construction costs for this transit item range from \$10,450,000 to \$13,750,000.

1.4 Roadway System

Grade Separations

General

The Composite Core Plan includes conceptual layouts for grade separations which connect to the proposed “merge and loop” Parkway and the Monterey Road Relocation Corridor. The Plan is intended to create a unique parkway character along Monterey Road with wide landscaping areas and streamlined merge and exit operations without traffic signals. It is an innovative plan with great opportunity to create a roadway system of special character, but it involves complicated challenges to assure that traffic operations are adequately maintained.

When detailed traffic projections are developed, weaving and merging operations for each of the proposed grade separation configurations should be reviewed. In conjunction with the traffic operations issues, consideration should be given to separation types. Underpasses (roadway under railroad tracks) are often preferred compared to overpasses (roadway over railroad) since they are perceived to be less obtrusive and more aesthetically pleasing within the community.

The concepts presented herein include specific proposals for overpasses or underpasses at each location. However, various factors that affect the feasibility and/or cost such as groundwater conditions, structure types and construction methods should be considered further.

1.4.1 Coyote Valley Parkway Grade Separation

The proposed grade separation consists of a bridge structure over Coyote Creek Golf Drive and an overpass structure over Monterey Road and Union Pacific Railroad (UPRR). It includes construction of a partial cloverleaf as a connector to Monterey Road for northbound and southbound returns to Coyote Valley Parkway. Coyote Valley Parkway would consist of three (3) lanes of traffic in each direction with a minimum 8-foot shoulder on each side and a shared use trail on one side. The design incorporates detention basins within the loops for storm water treatment control purposes.

The estimated probable construction cost range for this grade separation is \$28,500,000 to \$37,500,000.

1.4.2 Bailey Avenue Grade Separation Modification

Currently, the U.S. 101/Bailey Avenue Interchange is being constructed under three separate contracts. The first portion of construction from U.S. 101 to Monterey Road is scheduled to be complete and operational in November 2004. The Bailey Avenue overpass over Union Pacific Railroad will be constructed under a separate contract; it will include construction of two (2) lanes in each direction and will be completed in December 2005.

The proposed modifications would widen the overpass to the ultimate width of three (3) lanes eastbound and four (4) lanes westbound and modify the at-grade connectors to Monterey Road. The proposed grade separation would connect Monterey Road to the North-South Arterial running parallel to and west of Monterey Road, as well as connect U.S. 101 to the Coyote Valley Specific Plan Area, and accommodate the relocation east of Monterey Road. Some modifications would be necessary on the northeast ramp to accommodate detention basins, which are being used to treat stormwater in the project area.

Estimated total construction costs for this grade separation modification range from \$5,700,000 to \$7,500,000.

1.4.3 Laguna Avenue Grade Separation

The proposed underpass would interconnect developments east and west of Monterey Road at a location south of existing Laguna Avenue and would accommodate the relocation of northbound Monterey Road to the east. The underpass connects northbound Monterey Road to southbound Monterey Road through a wide loop for returns. A detention basin and bioswale system could be incorporated within the loops, which would present the opportunity to implement stormwater quality features.

Preliminary analysis indicates the estimated total construction costs for this grade separation should range from \$21,850,000 to \$28,750,000.

1.4.4 Coyote Creek Golf Drive Grade Separation

The proposed overpass grade separation would connect U.S. 101 to Monterey Road and the planned Coyote Valley developments via Coyote Creek Golf Drive. The limits of the separation extend from the terminus of the U.S. 101/Coyote Creek Golf Drive Interchange east of Monterey Road to approximately 200 feet west of Monterey Road. The planned grade separation consists of a partial cloverleaf east of Monterey Road connecting Coyote Creek Golf Drive to Monterey Road North and routing traffic from northbound Monterey Road to Coyote Creek Golf Drive. It would also include loops along Monterey Road for traffic returns.

Estimated probable construction costs are estimated to range between \$29,450,000 and \$38,750,000 for this grade separation.

Roadways

1.4.5 “Merge and Loop” Parkway

The proposed “Merge and Loop” Parkway connects the entire development with Monterey Road and U.S. 101 with a parkway system that includes two (2) lanes in each direction with a broad median used for landscaping and biofiltration. The planned parkway is intended to connect traffic through sweeping merge ramps, roundabouts, and loop returns to produce a continuous flow of traffic without stops. The parkway layout would run from the north through Coyote Valley Research Park properties and parallel to the planned Fisher Creek bypass channel, hence connecting to Bailey Avenue with a single roundabout. The parkway would then pass through Bailey Avenue, connecting traffic to Bailey Over The Hill improvements through a four-legs roundabout. Traffic would then use two (2) lanes of roadway heading south on the west side of the developments connecting to the interact roads via loops and roundabouts and connecting to Monterey Road at the Coyote Creek Golf Drive grade separation.

The estimated probable construction cost range for the Merge and Loop Parkway is \$63,650,000 to \$83,750,000.

1.4.6 Monterey Road Relocation

The proposed concept is to relocate northbound Monterey Road into a curving parkway to the east of the current roadway and maintain the existing alignment southbound. The planned changes would accommodate two (2) lanes of traffic in each direction with additional lanes where needed for merging and weaving. The parkway would connect traffic to the proposed grade separations over or under UPRR with loop ramps and merge lanes designed to minimize traffic signals.

Total construction costs for this roadway relocation are estimated to range from \$11,400,000 to \$15,000,000.

1.4.7 North–South Arterial

The proposed arterial consists of three (3) lanes of traffic in each direction. It would connect traffic north and south of the proposed loop and parkway roadways via two four-leg roundabouts located at the south and north ends of the arterial. The proposed alignment has various T-intersections directing traffic to the developments and intersects with minor roads at the proposed multi-modal station.

Estimated probable construction costs range from \$22,800,000 to \$30,000,000 for the N-S Arterial.

1.4.8 Bailey Over The Hill

The proposed roadway would allow traffic to travel from U.S. 101 to Almaden Expressway through a four (4) lane road section through Calero Hills. The planned improvement would widen McKean Road and Bailey Avenue over the hills to two (2) lanes of traffic in each direction with 12-foot lanes, an 8-foot shoulder on one side and a 2-foot shyway on the other. A number of alternatives, including the two options shown in the City General Plan, were studied. The preferred plan uses separate “uphill” and “downhill” alignments on the east side of the hills to minimize grading and potential environmental impacts. All alternatives include a 14-foot median section, however the separate uphill/downhill alternative has no median. Due to the grade and to minimize environmental impacts, retaining walls are included in some of the cut areas.

Based upon the technical plans prepared for this roadway, the estimated total construction cost range is between \$19,950,000 and \$26,250,000.

1.5 **Non-Vehicular Circulation System**

1.5.1 County Parks Trails/Pedestrian/Bicycle Circulation System

In line with the Coyote Valley Specific Plan Vision and Expected Outcomes, an extensive system of parks, trails, and recreational areas have been incorporated within the Concept Core Plan that expands on the existing Coyote Creek Park Trails, Monterey Road Bicycle Trail, and Santa Teresa County Park Trails. The system utilizes individual and shared-use trail types, including: Caltrans Class I and II Bikeways, Equestrian Trails, Hillside Scenic Trails, Urban Trails, and shared-use trails.

The probable construction costs associated with the non-vehicular circulation system are estimated to range from \$8,550,000 to \$11,250,000.

2.0 HYDROLOGY AND FLOOD CONTROL FACILITIES

2.1 Coyote Valley Lake

Coyote Valley Lake is a conceptual body of water proposed at the existing intersection of Santa Teresa Boulevard and Bailey Avenue that is intended to be the centerpiece of the proposed development. The focal lake would have a surface area of roughly 60 acres and would serve as a vital component of the hydrological and flood control system of the post-developed Coyote Valley by providing flood storage and a source of irrigation supply. The lake is intended to support a variety of recreational activities, including a swim lagoon, parks and open space.

The estimated range of total construction costs for the lake is approximately \$38,000,000 to \$50,000,000, as described in the technical report.

2.2 Fisher Creek Relocation

The Composite Core Conceptual Plan seeks to address existing flooding issues surrounding Fisher Creek by proposing three segments of channel improvements with primary objectives to maintain existing flood storage, convey the 100-year event, and provide additional flood storage to accommodate increased urban runoff. The ultimate goal is to maintain existing discharges at the Coyote Creek confluence. Another goal is to restore the channel to a more natural state by relocating it to the lowest-lying areas of the valley along its historic course at the base of the Santa Teresa foothills.

2.2.1 Fisher Creek Relocation - Segment 1

The current Fisher Creek would be abandoned from Richmond Avenue to Bailey Avenue and relocated to the western lowlands. South of Richmond Avenue, the channel would be widened and improved in its existing location. Relocation and improvement of this segment could involve construction of approximately five bridges and/or box culverts for road crossings. Major components of the 300-ft corridor include a main channel, low-flow channel, maintenance road, trail, and riparian bench to accommodate flood storage and habitat planting.

The estimated probable construction costs for this segment of the relocation range from \$9,500,000 to \$12,500,000.

2.2.2 Fisher Creek Relocation - Segment 2

This section of existing Fisher Creek north of Bailey Avenue and west of Santa Teresa Boulevard would be abandoned up to the reinforced concrete box culvert (RCB) at Santa Teresa Boulevard. The relocation would include implementation of the planned North Coyote Valley (NCV) flood control improvements. The major components of the NCV flood control facilities consist of a new flood control bypass channel, two flood detention basins, open space area, Fisher Creek channel improvements, levee improvements, roadway improvements, and bridge and culvert improvements.

The construction costs associated with this segment include the NCV flood control improvements and are estimated to range between \$19,000,000 and \$25,000,000.

2.2.3 Fisher Creek Relocation - Segment 3

The third segment of improvements involves the restoration of Fisher Creek from the NCV flood control outfall to the downstream confluence with Coyote Creek. The restoration would widen and improve Fisher Creek and enhance the riparian habitat along its banks.

This segment of creek improvements has an estimated probable construction cost ranging from \$6,650,000 to \$8,750,000.

2.3 Detention Ponds

To make efficient use of the land, sites designated for recreational purposes (i.e. ballfields, schools, and community parks) on the Composite Core Conceptual Plan have also been identified for potential flood storage in the form of stormwater detention ponds. Detention basins would be designed to retain water during storm events and gradually discharge into the storm system, so as not to overload regional conveyance facilities such as the Coyote Valley Lake, relocated Fisher Creek, and ultimately Coyote Creek at the Coyote Narrows. The ponds would also provide biofiltration of urban runoff from the development.

The total estimated construction cost range for the detention ponds is approximately \$4,750,000 to \$6,250,000, based upon a preliminary facility analysis.

2.4 Urban Canal

The urban canal concept is a shallow linear channel, with both hard and soft edges, situated on 12 to 15 acres of parklands. A 12-ft wide Class I bicycle and pedestrian walk is proposed alongside the canal as part of the non-vehicular transportation and circulation system for the project. The urban canal would also serve as a primary component for circulation, aeration, and biofiltration for the Coyote Valley Lake waters. A major design goal is to create a canal that has running water throughout the year, including the dry months. Major components of the canal include a low-flow channel and a main channel to accommodate peak runoff. The urban canal would have a maximum corridor width of 100 ft, a total length of nearly 10,000 ft, and would be constructed in two segments.

2.4.1 Urban Canal - Segment 1

The urban canal would begin at a high point proposed at the Parkway and would continue northward through the flatlands of the Coyote Valley development to its eventual connection with Coyote Valley Lake. A majority of this segment would be a hard canal characterized by gradual slopes and straight segments that would experience a series of drops and 90 degree turns. It would then transition to a soft canal with minimal slope prior to entering the focal lake.

Probable construction costs for this segment of the urban canal are estimated to be between \$9,500,000 and \$12,500,000, based on approximately 7,000 ft of canal.

2.4.2 Urban Canal - Segment 2

The second segment would start at the same location along the Parkway and would run in a southwesterly direction to a confluence point with the relocated Fisher Creek. This segment would be a much shorter channel, consisting of both hard and soft canals, that could be constructed at minimal slopes and empty into a pool feature at Fisher Creek.

This segment of the canal would be roughly 3,000 ft in length, and would range from \$4,750,000 to \$6,250,000 for a total estimated construction cost.

3.0 STORM DRAINAGE FACILITIES

3.1 Storm Drainage System

The storm drain master plan for the project conceptualizes a system that replaces traditional hard pipe and storage facilities, where practical, with vegetated conveyance and storage facilities that also perform biofiltration of stormwaters prior to discharging into receiving waters (i.e. Coyote and Fisher Creeks). The areas reserved for open space and recreational uses by the Composite Core Conceptual Plan have been evaluated and incorporated into this concept based on their proximity to effective floodplains, location within a post-development tributary drainage area, efficiency of land use, and existing drainage characteristics of the Valley.

Probable construction costs for the storm drainage system, including a combination of bioswales and conventional piping system, are estimated to range from \$17,100,000 to \$22,500,000.

4.0 SANITARY SEWER AND WASTEWATER FACILITIES

4.1 Sanitary Sewer System

The San Jose/Santa Clara Water Pollution Control Plant (WPCP) currently operates under a 120 million gallon per day average dry weather effluent flow (mgd ADWEF) constraint. One of the primary goals is to stay below the WPCP ADWEF cap of 120 mgd by incorporating the use of recycled water on this project. The Coyote Valley sanitary sewer system conceptualizes a network of roughly 100,000 lineal feet of pipe distributed along major arterial and collector roadways within the Concept Core Plan. Primary sewer collectors in this concept plan would generally follow the natural grade patterns of the valley and utilize existing facilities wherever possible to minimize costs. The main sewer trunk line would begin at the proposed intersection of Palm Avenue and Santa Teresa Boulevard, continue north through the development and around the Coyote Valley Lake, to an eventual connection with the existing 48" sewer main in Santa Teresa Boulevard. The technical concept plan proposes a schematic layout for individual subdivision feeders, but these have

not been included in the facility cost analysis enclosed. It should be noted that the extent of existing infrastructure within the Coyote Valley project area is limited to the North Coyote area, which directly impacts the future cost burden of the proposed development.

Based upon the concept plan and technical analysis, the estimated total construction cost range for the sanitary sewer system is \$22,800,000 to \$30,000,000.

5.0 POTABLE WATER SYSTEM FACILITIES

5.1 Water Supply

During the constraints analysis phase, the Coyote Valley Basin was analyzed based on current pumping rates. The total projected water demands for the CVSP area were estimated to be 16,000 to 20,000 AF/YR, which is based on average day demands. The objective is to provide a balanced supply of water of good quality to the proposed development. It has been determined that, to ensure the long-term sustainability of the Coyote Valley subbasin, a balance must be achieved by maintaining stable groundwater levels. Further analysis concluded that the additional water supply necessary to maintain equilibrium in the groundwater basin based upon average day rates would be approximately 6,000 to 10,000 AF/YR. Listed below are options for additional water supply necessary to maintain equilibrium in the groundwater basin.

Water Supply Options

Groundwater Recharge

- Additional releases from Anderson Reservoir to Coyote Creek via the Cross Valley Pipeline
- Out-of-County Import: Via the Santa Clara Conduit (USBR) connecting San Luis Reservoir to Anderson Reservoir
- Groundwater recharge within Coyote Valley Basin using advanced treated recycled water

The estimated Total Safe Yield of the groundwater basin = 12,000 AF/YR. The estimated existing groundwater basin demands = 8,000 AF/YR. Thus, the total recharge potential for the basin = 4,000 AF/YR. Options to provide recharge via the Cross Valley Pipeline or the Santa Clara Conduit have dry year limitations. Groundwater recharge within the Coyote Valley Basin using advanced treated recycled water is limited by the capacity of the recycled water system.

Recycled Water Usage

- Advanced Treated Recycled Water within Coyote Valley Basin
 - Direct Landscape Use: Developed sites (30% reduction of potable water demand)
 - Parks/Schools/Right-of-Ways/Open Space (730 acres): Irrigation
- Advanced Treated Recycled Water within Santa Clara Basin

- Regulatory Incentives: Incentives to encourage shift from potable water to recycled or treated water

Recycled water usage within Coyote Valley may be limited by the capacity of the recycled water system.

Water Conservation

- Coyote Valley – Demand reduction design guidelines should be included in planning documents

Direct Potable Use

- Local Import – Bring supply from Santa Clara Basin, north of Coyote Narrows; requires flows within the basin to mitigate use
- Surface Water
 - Surface Water Treatment Plant - has seasonal limitations
 - Water from the Cross Valley Pipeline
 - Water from Semi-tropic Sources

Even if this option does not become the source of the required additional water supply, much like an interconnection, a facility such as this would provide a redundant source of water during an emergency event.

The estimated probable construction costs for water supply options range from \$19,000,000 to \$25,000,000.

5.2 Potable Water System

The Coyote Valley Specific Plan area designated by the City of San Jose for Urban Services is bounded by Tulare Hill to the North, Palm Avenue to the South, Highway 101 to the east, and the Santa Cruz Mountains to the west. Based upon the Technical Memorandum produced for the Water Technical Subcommittee, the total projected water demands for the CVSP area are estimated to be 16,000 to 20,000 AF/YR or 14.2 to 17.8 mgd, which is based on average day demands. These figures include the minimum of 25,000 residential units, 50,000 jobs, as well as existing demands in the Greenbelt and other areas, which comprise the entire Coyote Valley groundwater subbasin. Maximum day demands for the 25,000 residential units and 50,000 jobs were calculated to be 22.1 mgd.

Water Distribution Network

Along with meeting applicable design codes and criteria, the primary objective of this system – to achieve and maintain a balanced demand and distribution of water service over the entire development area – would be achieved by the inclusion of at least one storage tank, and three pump stations per zone. A minimum of two interconnections are planned between each zone that would allow independent function from one another under normal conditions, and would also provide supplementary supply from an adjacent zone for

planned maintenance activities or if pressures drop below minimums due to an emergency event.

Water System Pump Stations

Based upon previous tests for recently constructed wells and pump stations constructed in the North Coyote Valley area, the estimated yield for each pump station was projected to be 3,000 gallons per minute (gpm). Subsequently, safe yield for wells was estimated to be approximately 2,000 gpm, based upon these tests. To supply the estimated maximum day demand for each zone of 5,100 gpm, it has been determined that three pump stations would be required per zone. The estimated maximum day demand for each pump station is approximately 1,700 gpm, which is less than the estimated safe yield of 2,000 gpm. The three basic components of a pump station are the mechanical system, electrical system, and facility/site improvements.

Water Storage Tank and Access Road

The two main functions of a water storage tank are to equalize supply and demand over periods of varying consumption and to supply water during equipment maintenance, failure, or for fire events. The water tanks are sized to include the reserve for domestic consumption, the required fire flow, and a factor of safety. The demands for the 50,000 jobs have been accounted for within the North Coyote Valley Campus Industrial Project, by the recently constructed 4.0 million gallon water tank. Storage volumes were estimated to accommodate mixed uses throughout the project study area. Domestic water demands were estimated to be 7.5 million gallons per day (mgd) to serve 25,000 units in the study area. Adding a 25% factor of safety to the total estimated demand of 5.5 mgd yields a storage volume of roughly 7 million gallons. This volume is too large for a single tank and would be better suited for two tanks, each of which would be approximately 4 million gallons. The two water tanks would be constructed in the western hills, and the storage volume would come from local wells and pump stations constructed to provide water to the study area.

Total probable construction costs for the potable water system are estimated to range between \$51,300,000 and \$67,500,000.

6.0 RECYCLED WATER SYSTEM FACILITIES

6.1 Recycled Water System

The City of San Jose and the SCVWD encourage the use of recycled water for this project. The City of San Jose Environmental Services Department, Municipal Water System Division, currently provides recycled water service to the area. As the regional groundwater manager, the SCVWD is responsible for monitoring water supply availability in Coyote Valley and assessing regional impacts that development may have on groundwater resources and water supply reliability in the project area. Recycled water, also known as reclaimed water, refers to the treatment of wastewater. Treatment is performed at the San Jose/Santa Clara Water Pollution Control Plant (WPCP). In order to reduce flows to the

WPCP, the City encourages the use of recycled water as much as possible, particularly in new development, and will continue to encourage water conservation programs that result in reduced demand for sewage treatment capacity.

The Environmental Services Division recently constructed the Silver Creek Extension to serve the Silver Creek and Santa Teresa communities and Metcalf Energy Center (MEC). The project consisted of a seven-mile-long recycled water pipeline that was constructed in two segments simultaneously: a Northern Segment and a Southern Segment. The Southern Extension Segment began at a pipeline along Hellyer Avenue, ran west along Silicon Valley Boulevard, and continued south along Monterey Road until it terminated at Blanchard Road in North Coyote Valley to serve MEC. The total capacity of the Silver Creek Pipeline is 15 mgd and would be the source of recycled water for this project.

As part of the Water Supply Analysis, recycled water was identified as a component of the overall water supply balance for the Coyote Valley groundwater subbasin. The elements identified for potential recycled water usage were groundwater recharge, direct landscape use, and to provide incentives to shift from potable water use to recycled water use depending upon application. The estimated total potential average day demand for recycled water is equal to approximately 9,000 AF/YR. Currently, the conceptual recycled water system plan contemplates utilizing advanced treated recycled water for direct landscape use for irrigation of parks, schools, rights-of-way, open space and the Coyote Valley Lake. The conceptual recycled water system envisions approximately 134,000 LF of water main and a 4.0 MG storage tank. As stated previously, the function of the water storage tank is to equalize system pressures, supply, and demand over periods of varying consumption. Local distribution pipelines would be used to deliver recycled water to end users.

The range of estimated probable construction costs for recycled water system facilities are approximately \$27,550,000 to \$36,250,000.

6.2 Advanced Treated Recycled Water Plant

The Feasibility Project Study performed by Black and Veatch for the Santa Clara Valley Water District contained several options for advanced treated recycled water plants at various locations that would provide different volumes for different service areas. One option in the study was a Full Scale Alternative 2, the purpose of which was to replace groundwater and/or treated surface water with advanced treated recycled water as the source for industrial uses, landscape and agricultural irrigation, as well as streamflow augmentation within the Specific Plan area and areas to the south. This alternative would involve the construction of an Advanced Recycled Water Treatment (ARWT) facility near the Metcalf Energy Center (MEC) in North Coyote Valley. An extension of the South Bay Water Recycling (SBWR) pipeline called the Silver Creek Pipeline, which recently completed construction, would transport water to this plant from the San Jose/Santa Clara Water Pollution Control Plant (WPCP). In addition, this concept called for the construction of a split-stream desalination plant at the WPCP, in order to return the Total Dissolved Solids (TDS) levels to pre-ARWT concentration levels.

The estimated total construction costs for the Full Scale Alternative 2 range between \$47,500,000 and \$62,500,000.

7.0 ELECTRICITY, NATURAL GAS AND COMMUNICATIONS

General

The proposed development would create a wide range of building types, land uses and activities that would require more utility service than is currently provided. With the planned urbanized land use, all electrical power would be underground. Use of green power, which is derived from solar, wind, geothermal, biomass or low-impact hydro sources, would be encouraged and implemented where reasonable. Each of the facilities included in Section 1.4 "Roadway System", as described herein, could have electricity, natural gas and joint trench facilities. Some provisions have been made for abandonment and relocation of existing facilities.

7.1 Electricity and Natural Gas

The total probable construction costs for electricity and natural gas facilities are estimated to range from \$5,700,000 to \$7,500,000.

7.2 Joint Trench

The estimated range of probable construction costs for joint trench facilities is approximately \$5,700,000 to \$7,500,000.