FINAL

Squaw Valley Public Service District

Alternative/Supplemental Water Supply and Enhanced Utilities Feasibility Study

September 2009

Submitted to
Squaw Valley Public Service District

Submitted by
ECO:LOGIC Engineering

ECO:LOGIC
ENGINEERS · CONSULTANTS

Contents

Squaw Valley Public Service District – Alternative/ Supplemental Water Supply and Enhanced Utilities Feasibility Study

Tables

Figures

Photographs

ECO:LOGIC
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Squaw Valley Public Service District - Alternative/Supplemental Water Supply and Enhanced Utilities Feasibility Study

Executive Summary – Final

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Date: September 29, 2009

ES.1 PURPOSE

The Squaw Valley Public Service District (District) commissioned ECO:LOGIC Engineering to conduct a study investigating the feasibility of importing water supplies from outside District boundaries as a supplemental and/or alternative water supply for the Valley's current and future water supply customers. Drilling new production wells within the Olympic Valley has become increasingly more difficult due to the limited capacity of the Squaw Valley aquifer to yield sufficient quantity and quality of potable water.

This feasibility study addresses the following topics:

- Technical Memorandum No. 1 – Water Demand Projections and Water Supply Needs
- Technical Memorandum No. 2 – Truckee River Side Drainages Evaluation
- Technical Memorandum No. 3 – Groundwater Availability in the Martis Valley
- Technical Memorandum No. 4 – Transmission Main Alignment Evaluation
- Technical Memorandum No. 5 – Environmental Constraints Analysis
- Technical Memorandum No. 6 – Planning Level Facilities Cost Estimate

ES.2 WATER DEMAND PROJECTIONS AND WATER SUPPLY NEEDS

Future buildout water demands for the District are based on the *Squaw Valley Groundwater Development and Utilization Feasibility Study, 2003 (Groundwater Study)*. The *Groundwater Study* estimated the future buildout average annual demand (AAD) and maximum day demand (MDD) for the District's service area at 1,628 acre-feet annually (AFA) and 2,525 gallons per minute (gpm), respectively.

The supplemental water supply needs are based on the difference between the District's 2007 water demands and the estimated buildout demands presented in the *Groundwater Study*. In 2007, the District's AAD and MDD were 419 AFA and 574 gpm respectively.

Based on this difference, it is estimated that the District will need to supplement their 2007 water use with an additional 1,210 AFA on an average annual basis and 1,951 gpm to meet the buildout MDD.

ES.3 TRUCKEE RIVER SIDE DRAINAGES

A component of the supplemental water supply investigation included the review of potential well sites along the side drainages along the Truckee River in the Highway 89 corridor between Truckee and Squaw Valley. The side drainages evaluated included Silver Creek, Deer Creek, Pole Creek, Deep Creek and Cabin Creek, which flow into the Truckee River along Highway 89.

Based on the geology, observations, and known groundwater quality issues along the Truckee River, none of the drainages investigated appear to be particularly favorable for production of groundwater for use as a water supply for Squaw Valley, and some of the sites are considered unfavorable. All of the sites have relatively thin alluvial aquifers underlain at shallow depth by volcanic bedrock which may have either low permeability or poor water quality.

ES.4 GROUNDWATER AVAILABILITY IN THE MARTIS VALLEY

ES.4.1 AVAILABLE GROUNDWATER RESOURCES

There have been a number of studies performed in the recent past discussing the availability of groundwater in the Martis Valley Groundwater Basin (MVGB). In The 2001 Nimbus Engineers report *Ground Water Availability In The Martis Valley Ground Water Basin, Nevada and Placer Counties* concluded that 24,000 AFA of groundwater is available in the MVGB. The 2003 InterFlow Hydrology, Inc, and Cordilleran Hydrology, Inc. study, *Measurement of ground water discharge to streams tributary to the Truckee River in Martis Valley, Placer and Nevada Counties, California*, concluded there may be as much of 10,000 AFA of groundwater discharge to tributary streams in the MVGB not accounted for in the water budgets suggested in previous investigations, bringing the total resource to 34,000 AF/yr. The TDPUD Urban Water Management Plan [2005] concluded ". . . it is reasonable to assume, that, at a minimum, the 24,000 AFA of [ground] water cited in the Nimbus study is available to support development in Truckee and the surrounding areas."

ES.4.2 GROUNDWATER RESOURCE DEMANDS AND AVAILABILITY

Currently, there are four major water purveyors/parties that pump water from the MVGB. They include:

1. Truckee Donner Public Utility District (TDPUD)
2. Northstar Community Services District (NCSD)

3. Placer County Water Agency (PCWA)
4. Other Purveyors (Donner Creek Mobile Home Park, Ponderosa Golf Course, Teichert Aggregates, and other individual well owners)

The TDPUD Urban Water Management Plan [2005] indicated a buildout water demand for all water producers in the MVGB is 22,490 AFA. This has recently been revised downward by a reduction in buildout development within the PCWA service territory to 21,399 AFA. If this estimate is correct, there may be as much as 2,600 AF/yr (24,000 AFA supply minus 21,399 AFA demand) of groundwater in the MVGB potentially available for other users, including as a potential water supply for Squaw Valley. Using the Interflow Hydology, Inc. groundwater availability estimate of 34,000 AFA, there would be as much as 12,600 AFA available groundwater resource in the MVGB.

Based on the available literature related to available groundwater resources and demands in the MVGB, it appears as if there are adequate water resources to provide groundwater in amounts sufficient to meet the buildout demand of the District, even using the most conservative estimates of the available resources and buildout demand in the Basin.

ES.4.3 TRUCKEE RIVER OPERATING AGREEMENT (TROA)

TROA was signed on September 6, 2008. The California allocation of water for the Truckee River basin downstream of Lake Tahoe provides up to 32,000 AFA, of which surface water diversions cannot exceed 10,000 AFA, to water users in the basin. The California Department of Water Resources has projected the water demands for the Truckee River basin to be 22,700 AFA by the year 2033. It appears that the additional demand requested by the District will not cause the basin demands to exceed the 32,000 AFA limit.

TROA also sets requirements on well locations and design criteria. The well location and design criteria in TROA section 10.B.2 are not onerous and do not significantly impact the drilling of wells in the Tahoe-Truckee Sanitation Agency Special Zone, the Truckee Donner Public Utility District/Martis Valley Special Zone and the Northstar/Placer County Special Zone, provided that the appropriate setbacks are maintained. The major design criterion listed in 10.B.2 is a well seal depth requirement that is present in some of the special zone standards.

ES.4.4 DISTRICT'S RIGHT TO WATER FROM THE MVGB

The two limitations on the District's right to export water from the MVGB include California groundwater law and the quantity limitations set forth in TROA. A 2007 letter from PCWA's attorney Janet Glodsmith to Mal Toy (PCWA) provided legal opinion on these issues.

With respect to California water law, use of MVGB groundwater by the District as well as by TDPUD, PCWA and NCSD is considered an appropriation of groundwater (an export not directly serving overlying landowners in the basin of origin). As appropriators from the MVGB they may only take water in excess of that necessary to serve the overlying lands. The 2007 letter indicated that "the limitation of appropriable water to the surplus over the needs of overlyers and

prior appropriators creates uncertainty about the long-term availability of water for export". Based on this uncertainty, it is recommended that the District work with PCWA and/or TDPUD to agree upon an long term allocation of potentially available water supplies from the MVGB.

Based on the TROA allocation of 32,000 AF/yr for water supply in the Truckee River basin and the California Department of Water Resources water use estimates for the MVGB, it appears that the District's supplemental water supply need will not cause the basin water demands to exceed the allocation limit.. In June 2003, the CNWAS prepared a letter (Nelson, 2003) identifying the current water use in 2002 and the projected water use for the year 2033 in the Truckee River and Lake Tahoe Basins of California. The total groundwater and surface water demand projected for the Truckee River Basin in 2033 was estimated by CNWAS to be 22,700 acre feet. According to the chief engineer of the CNWAS, the Department of Water Resources does not expect the water demand in the Truckee River Basin to grow to the 32,000 acre foot allocation in the foreseeable future and that the demand projection contained in the 2003 letter remains valid (Sarna, 2008).

ES.4.5 EXPORT WATER SUPPLY ALTERNATIVES

There are two reasonable alternatives for developing sources of groundwater in the MVGB that might be supplied to the District. These include obtaining water service from the TDPUD, PCWA, or NCSD, or construction of new well or wells in the MVGB expressly for this purpose.

The TDPUD requires four new wells to meet their buildout demand (Ed Taylor, personal communication, 2008). Consequently, they do not have excess production capacity that could be supplied to Squaw Valley. Likewise, the NCSD plans to construct additional new wells to meet their buildout demand. Finally, the groundwater derived from the PCWA Zone 4 water system that provides the supply for the Lahontan, Siller Ranch, and Timilick subdivisions are fully committed (Brian Martin, 2008). For both the PCWA and NCSD water systems, the developments are only partially built. If the District where to select PCWA or NCSD as their future water purveyor there ***may be*** a scenario where the District could purchase available excess capacity and use it until the buildout demand is met by the PCWA or NCSD future customers. Nevertheless there is no guarantee that this water will be available in the future when the District needs it. This scenario should be investigated during the predesign phase of the project.

For new sources within the MVGB, two areas have been targeted for further consideration as production well sites (Figure ES-1). These include:

- A parcel of land owned by the Airport Authority located near the intersection of Schaeffer Mill Road and State Route 267. This site is located approximately 1,500 feet southwest of TDPUD's Airport Well.

- The Sayers-Tong property located between Shaeffer Mill Road and State Route 267.

The proposed well sites are located in the Northstar/Placer zone identified in TROA. They appear to be located sufficiently far from streams, ephemeral streams, ponds and lakes to be

presumed to be in compliance with TROA. Field investigations to pin down the precise well locations will include evaluations to confirm this assumption.

ES.5 TRANSMISSION MAIN ALTERNATIVE ALIGNMENTS

ECO:LOGIC investigated several different alternative alignments to convey water from the MVGB to Squaw Valley. These alternative alignments require the District to partner with Placer County Water Agency (PCWA), Truckee Donner Public Utilities District (TDPUD), or a combination of both. The alignment corridors are defined as the Highway 89 corridor, which is along the shoulder of Highway 89 between Truckee and Squaw Valley, and the United States Forest Service (USFS) Road 6 Corridor. This study also looked at the current TTSA sewer line and easement along the Truckee River as a potential alignment.

The chosen alignment corridor will be based on which water supply alternative is selected. The alternatives examined include:

- Water supply through the TDPUD water system and new transmission main along the Highway 89 corridor;
- Water supply through the PCWA water system and new transmission main along the USFS corridor.

Figure ES-1 shows the alternative alignment corridors along with the PCWA and TDPUD water system boundaries.

The feasible water supply options discussed with TDPUD and PCWA would include one of the following:

- TDPUD supplying water to the District through its existing infrastructure;
- PCWA/NCSD supplying water to the District through TDPUD infrastructure;
- PCWA/NCSD supplying water to the District through the Zone 4 existing infrastructure; or
- The District wheeling water through either the PCWA or TDPUD system and supplying water to Squaw Valley through facilities owned and operated by the District.

Any of the options would require the District to construct a number of new water supply facilities including a new water supply well, booster pump station, transmission main, and terminal water storage tank in Squaw Valley.

ES.5.1 HIGHWAY 89 CORRIDOR

In this alternative, the District would finance and drill a well either in the Truckee Airport or Lahontan subdivision areas. Water would be wheeled through TDPUD's existing water system infrastructure beginning near the well site to one of two connection points:

- The intersection of Highway 80 and Highway 89 (near the intersection of Donner Pass Road);
- The intersection of Highway 89 and West River Road.

From these locations, a new pipeline would be constructed along the shoulder of Highway 89 South for approximately 9 miles towards Squaw Valley. The pipeline would terminate at a new water storage tank north of Squaw Creek and the Painted Rock subdivision.

ES.5.2 UNITED STATES FOREST SERVICE (USFS) CORRIDOR ALTERNATIVE

In this alternative, the District would finance and drill a well either in the Truckee Airport or Lahontan Subdivision areas (Figure 4-3), or utilize excess available capacity from NCSD's TH-1, TH-2, and/or TH-3 wells, if available. Utilizing the option of new wells near the airport of the Lahontan subdivision, water would be piped from near Highway 267, up Schaefer Mill Road to PCWA's existing water tanks within the Zone 4 water system. If the project is phased, smaller flows could be wheeled through PCWA's existing infrastructure. Buildout flows would require a new or parallel pipeline up Schaefer Mill Road to meet the buildout 2,000 gpm. With NCSD sources, the water would be piped from the wells up Highway 267 and Schafer Mill Road and into the PCWA system. Conveying water through NCSD's existing water system infrastructure is not feasible as this would require major capacity upgrades to the distribution system.

From the water tanks, a new booster pump station would be constructed and the transmission main alignment would then follow a southeasterly course to connect with the National Forest Service 06 Road (NFS 06). The pipeline would follow the NFS 06 Road, mostly along the existing dirt single lane roadway, until the beginning of Deer Creek. At this point the pipeline would wind down the ridge just south of Deer Creek following a series of existing dirt trails and end up south of Squaw Valley. The pipeline would then continue north along the east side of the Truckee River and cross at one of the existing bridge crossings in the vicinity of the Squaw Valley entrance. After crossing the Truckee River and Hwy 89, the pipeline would terminate at a new water storage tank north of Squaw Creek and the Painted Rock subdivision.

ES.5.3 TTSA CORRIDOR

The TTSA sewer interceptor runs parallel to the Truckee River between North Lake Tahoe and the TTSA wastewater treatment plant of off Highway 267. The sewer interceptor is located within an easement that ranges in width from 5-15 feet. Due to the limited width of the easement and the potential close proximity of the sewer interceptor to the new water transmission main, this alternative is not feasible for further study.

ES.5.4 POTENTIAL JOINT TRENCH UTILITY PARTNERS

ECO:LOGIC met with Suddenlink Communications and Southwest Gas (SWG) to discuss their desire to participate in this project with the District as a joint utility project. Both parties expressed interest with varying conditions. NV Energy (formerly Sierra Pacific Power

Company) was also contacted but has never formally provided a response to their desire to participate in the project.

Suddenlink has already installed an above ground fiber from Truckee south to just north of the Silver Creek Campground. They have attempted for over three years to get easements to allow them to continue their fiber to Squaw Valley. Suddenlink is aggressively pursuing a route that allows them to complete their fiber run from the Silver Creek Campground to Squaw Valley. They are interested in participating in a joint trench with the District; however, if another opportunity to run their fiber presents itself in the meantime they would pursue that option first.

SWG is also interested in participating in a joint trench project with the District. If the project were to move forward, SWG would perform a survey of the Squaw Valley residents to determine the level of interest in natural gas. After this survey is completed, SWG would have a cost estimate for their infrastructure needs. However, SWG's company policy requires a third party to fund the necessary infrastructure to get natural gas to new customers. Only after new customers sign up for service, would SWG provide a reimbursement check to the third party. The reimbursement program would only occur for a ten year period after which SWG would not provide any further reimbursement to the third party. ECO:LOGIC believes there is a possibility SWG would be willing to negotiate how their part of the project would be funded.

ES.6 ENVIRONMENTAL CONSTRAINTS ANALYSIS

The purpose of the environmental constraints analysis was to determine whether there are any major liabilities or fatal flaws that would severely constrain the intended use of either alignment alternative and to assess the routes from an environmental permitting/compliance perspective. The specific objectives of the analysis were to (1) identify any documented constraints through literature surveys and (2) define any additional site-specific constraints through local area knowledge. The goal is to assist in identifying the most efficient pipeline alignment from an environmental perspective.

In general, based on a literature review there appears to be no outstanding environmental compliance "fatal flaws" associated with the use of the property for water supply pipeline. The installation of pipelines along either route would require compliance with CEQA (and NEPA-NFS 06 Road Alignment), Clean Water Act Section 401 and 404, Federal Endangered Species Act Section 7, California Endangered Species Act and California Fish and Game Code Section 1600. The NFS 06 Road Alignment crosses federal lands (US Forest Service), which will trigger the need to comply with NEPA (as well as CEQA). In contrast, the Highway 89 Route is located in both Placer and Nevada County (Town of Truckee), triggering General Plan compliance for both counties and both counties will be considered "responsible agencies" under CEQA. Below is a summary of the findings.

ES.6.1 LISTED AND SPECIAL STATUS SPECIES

Plant Species

A desktop analysis of potential special status plant species within either pipeline alignment indicates a low to medium potential of listed status plant species being present. There is a medium potential for occurrence of Donner Pass buckwheat, Plumas ivesia, Marsh skullcap, and American manna grass. Three other species that have a low potential of impact from the proposed project are the Carson Range rock cress, the Nevada daisy, and Munroe's desert mallow because the project alignments are outside of the range of known populations of these species. The County will need to be consulted to determine if a tree removal permit is needed, if so, the timeline takes approximately one month to complete. Potential impacts and mitigation measures will need to be addressed in the CEQA/NEPA document.

Fish and Amphibians

The Lahontan cutthroat trout and mountain yellow-legged frog are known to occur in tributaries to the Truckee River. Both species have a low potential for occurrence within the area of either alignment. The Lahontan cutthroat is limited to Pole Creek upstream of a natural barrier where it cannot be harmed by predators; however, populations have been encountered in Martis Creek within in the past 8 years (CNDDB, 2008). The mountain yellow-legged frog federal listing only applies to San Gabriel, San Jacinto, and San Bernardino Mountain populations. The frog was historically found along Squaw Creek and in Squaw Meadow upstream from the end of both alignments. The last registered sighting of the frog in the project area was in the 1960s. Federally listed species and their habitat are protected under the Federal ESA. Therefore potential impacts to these species' habitat will require USFWS consultations.

Nesting Raptors and Migratory Birds

ECO:LOGIC's review of the potential for special-status animal species to inhabit the either potential pipeline alignment indicates that nesting raptors and other migratory birds (northern goshawk, spotted owl, bald eagle, yellow warbler, willow flycatcher, and the osprey) would be protected and impacts to these species, should they nest on site, could be avoided by construction windows and/or nest buffer planning. There is known northern goshawk habitat along the NFS 06 Road Alignment indicating a greater lever for occurrence than along the Highway 89 Alignment. Protocol-level spotted owl surveys may be required along the NFS 06 Road Pipeline Alignment (pers. com. USFS, 2008). Other nesting raptor surveys may be required as well.

Mammals

The long-legged myotis, California wolverine, Sierra Nevada mountain beaver, and the Sierra Nevada red fox have a medium potential to be impacted by either alignment. There is suitable habitat along both alignments and the species range is known to cover all or part of the project area. The Sierra Nevada Mountain Beaver has a greater chance of potential impact from the Highway 89 Alignment, since it is known to occur in several of the tributaries to the Truckee that the alignment will cross. Other mammals that could possibly be impacted by either alignment

(low potential) are the Sierra Nevada snowshoe hare, the Sierra pine marten, and the western white-tailed jackrabbit.

Summary

Based on ECO:LOGIC's literature review, the Army Corps of Engineers will likely need to conduct Federal ESA Section 7 consultations with the USFWS for the federal species mentioned above. If there is a potential to "kill, harm or harass" a federally listed species or disturb its habitat, formal consultations and an incidental take permit will be required. This permit process can take over one year to complete; therefore, it is recommended the permit process begin early in the project design phase.

ES.6.2 WATERS OF THE US

The potential NFS 06 Road Alignment will be drilled under the Truckee River, thereby likely avoiding Corps jurisdiction (and impacts to aquatic species); however, the project will cross Deer Creek and may cross wetlands or other jurisdictional waters of the US. Additionally, the potential Highway 89 Alignment will cross multiple tributaries to the Truckee River and possibly unidentified wetlands. Wetland delineations should be the first steps once the pipeline route is defined. If impacts to wetlands/waters of the US can be reduced to less than 0.5 acres, the SVPSD may qualify for coverage under a Nationwide Permit #12 for Utility lines. If the impact area is larger than 0.5 acres, the District will need to apply for an individual permit. The Army Corps of Engineers will require avoidance, mitigation, or compensation for any proposed activities that would entail fill in jurisdictional waters of the US

ES.6.3 LAND USE

Based on ECO:LOGIC's literature reviews of the relevant planning documents and sources, there appear to be no land use constraints associated with the development of the National Forest 06 Road Alignment or the Highway 89 Alignment of the SVPSD water supply pipeline.

ES.6.4 CULTURAL RESOURCES

Based on ECO:LOGIC's literature review, no specific cultural constraints could be identified along either potential alignment. However, the potential for the presence of cultural resources in the vicinity should be considered low to moderate, and a full records search and field survey by a qualified Archeologist or Paleontologist should be completed prior to any construction. If any new cultural resources are uncovered during construction, avoidance, mitigation, or compensatory measures will need to be employed as necessary.

ES.6.5 ADDITIONAL ENVIRONMENTAL CONSIDERATIONS

In general, both projects would require Best Management Practices (BMPs) and possible mitigation measures to minimize potential environmental impacts to less than significant with regards to CEQA. Many of these standard BMPs can be included in the project description as environmental commitments the District is willing to make upfront in the process. Potential

impacts on air quality, water quality, hydrology, geology, traffic, recreation, and climate change will need to be addressed in the CEQA/NEPA document for either alignment.

ES.6.6 Environmental Approvals and Permitting

The project would require compliance with several environmental laws and acquisition of several environmental permits and approvals. Crossing federal lands as well as jurisdictional tributaries to the Truckee River will trigger compliance with all federal and state environmental regulations.

The potential project will likely trigger the following permit/environmental compliance requirements:

- California Environmental Quality Act Compliance
- National Environmental Quality Act Compliance (NEPA- Forest Service Route)
- Clean Water Act Sections 401 and 404 Permits/Certifications
- Lahontan Regional Board Discharge Prohibition Exception under Resolution No. 6-93-08
- US Fish and Wildlife Service Endangered Species Act Section 7 consultations
- State Historic Preservation Office NHPA Section 106 consultations
- California Fish and Game Code 1602 Permits
- Placer County Grading Permit
- Placer County Tree Permit

The timeline for these permits ranges from several weeks to over one year. Several of these permits, such as the Clean Water Act Section 404 permit can be streamlined by designing the project to avoid (to the extent feasible) and minimize impacts to jurisdictional waters of the United States. Such measures would enable the District to apply for coverage under existing nationwide permits rather than go through the longer process of obtaining an individual permit. The Table ES-1 below summarizes the necessary permits and required timeline for each.

Table ES-1
Permit Timeline

Permit Name	Trigger	Estimated Timeline*
CEQA Compliance	Discretionary Action by a SVPSD	1 year to 18 months
NEPA Compliance	Special Use Permit from National Forest Service	12-16 months
Clean Water Act 401 Certification (and Board - Resolution No. 6-93-08)	Surface Waters of the US	4-5 months
Wetland Delineation Verification	Waters of US (ordinary high water mark) and wetlands	6-8 months
Clean Water Act 404 Permit	Waters of US wetlands/vernal pools (ordinary high water mark)	1 year to 18 months
USFWS ESA Section 7 Consultations	Federally listed species of potential habitat for federally listed	7-8 months (assuming formal consultations)
SHPO NHPA Section 106 Consultations	Cultural Resources	2-3 months
CFG Code 1602 Permits	Impacts to Bed/Bank and floodplain	4-5 months
Placer County Tree Permit**	Removal of trees 6 " dbh or greater	1-2 months
Encroachment Permits (Caltrans and local agency)	Placement of pipeline within Caltrans or County Easements	2-6 months
Grading Permit and SWPP	County grading permit and State SWPPP for grading areas > 1 acre	2-6 months

* Estimated Timeline includes APPROXIMATIONS for ECO:LOGIC's time to prepare an application and the agency's review period.

** Public Utilities may be exempt.

ES.7 PLANNING LEVEL FACILITIES COST ESTIMATE

There are four different facilities that are needed to construct the Supplemental Water Supply Project. Each of these facilities are similar regardless of alignment alternative. They include the following:

1. Well Construction (2,000 gpm capacity at buildout)
2. Transmission Line
3. Booster Pump Station
4. Terminal Tanks

ECO:LOGIC developed a detailed planning level cost estimate for each one of these facilities for each of the two proposed alignments (Figure ES-1). The costs for the well and terminal water

storage tank are similar for each option. Costs associated with the transmission line construction for each alternative are different due to the fact the pipelines follow two completely different routes from the Martis Valley to Squaw Valley. The costs for the booster pump station are different based on the required pumping head for the two alternatives, with the USFS alternative requiring much higher horsepower pumps.

In addition to the four facilities described above, line items have also been added for the following:

- EIR preparation, environmental permitting, and preliminary planning and design
- Administrative and legal costs associated with land acquisition, easements, etc.
- Design engineering and construction management
- Construction contingency

The table below provides a summary planning level cost estimate for the Highway 89 and USFS corridors.

Table ES 2
Summary of the Supplemental Water Project Cost Estimate

Highway 89 Corridor		
	Item	
1	Well Construction	$1,588,000
2	20 Inch Transmission Main	$14,483,000
3	Booster Pump Station	$1,288,000
4	Terminal Tank	$1,812,000
5	EIR/Permitting/Preliminary Design	$1,000,000
6	Administrative/Legal (10%)	$1,917,000
7	Engineering Design (8%)	$1,533,600
8	Construction Management (10%)	$1,917,000
9	Construction Contingency (10%)	$1,917,000
	Total	**$27,500,000**

USFS 06 Road Corridor		
	Item	
1	Well Construction	$1,588,000
2	20 Inch Transmission Main	$18,639,000
3	Booster Pump Station	$1,378,000
4	Terminal Tank	$1,812,000
5	EIR/Permitting/Preliminary Design	$1,000,000
6	Administrative/Legal (10%)	$2,341,700
7	Engineering Design (8%)	$1,873,360
8	Construction Management (10%)	$2,341,700
9	Construction Contingency (10%)	$2,341,700
	Total	**$33,000,000**

ES.8 CONCLUSIONS

The purpose of the District's Supplemental Water Supply and Enhanced Utilities Feasibility study was to determine potential project "fatal flaws" on a component by component basis. The components that ultimately make this project feasible are available supply to meet demand, construction of high pressure water mains in sensitive areas, and the ability to permit the project with the numerous agencies that will become vital players in the design and construction process.

Based on this, the technical feasibility of the project is apparent based on the following:

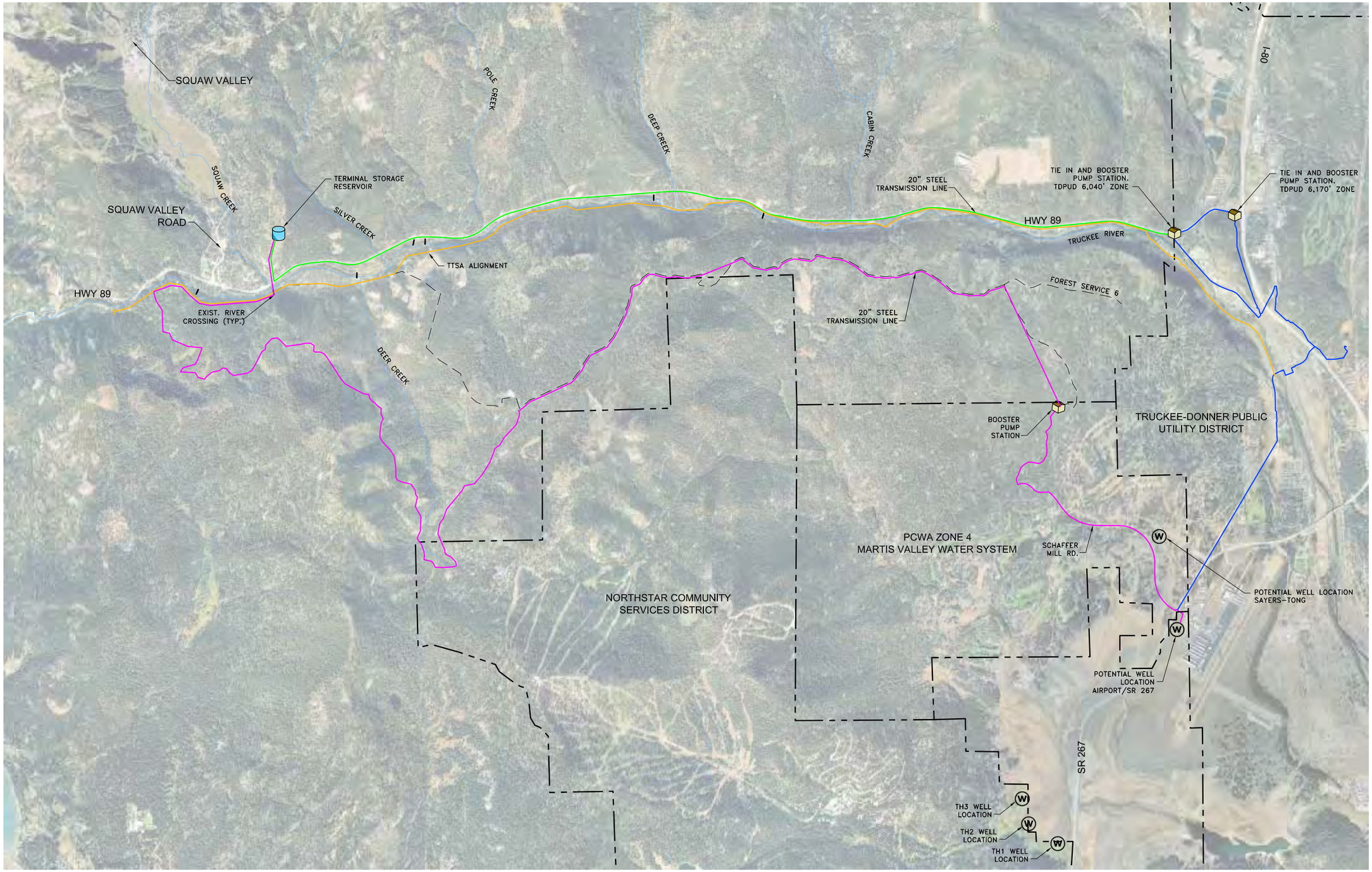
ES.8.1 WATER DEMAND AND SUPPLY

- The supplemental water Supply needs for the District as presented in this study are 1,210 AFA for an annual average demand and 1,951 gpm for a MDD.
- Based on numerous independent studies completed on the MVGB, the available annual yield of the aquifer is between 24,000-34,000 AFA.
- The current buildout water demand estimate for the other MVGB area water purveyors, including individual well owners, is approximately 21,399 AFA.
- Based on this there may be as much as 2,600-12,600 AFA of excess capacity in the MVGB.
- The study has concluded that there are areas within the aquifer, and adjacent to the PCWA and TDPUD water systems, that can potentially produce the required ultimate water supply needed of 2,000 gpm.
- Numerous meetings with PCWA TDPUD, and the NCSD have shown that these water purveyors have the potential infrastructure and desire to work with the District on this water supply project.

- Based on a review of the TROA, these well locations will meet the criteria required to drill a new well within the MVGB.
- Based on Truckee River basin water demand estimates, the District's supplemental water supply need should not cause the basin water demands to exceed the 32,000 AFA allocation limit.
- Under California groundwater law, transfers are allowed from MVGB to Squaw Valley.

ES.8.2 TRANSMISSION MAIN ALTERNATIVES

- The two transmission main corridors were studied based on right of way availability, permitting, and constructability.
- ECO:LOGIC and the District met with the Caltrans permitting staff and it was concluded that the Highway 89 corridor meets the above mentioned criteria.
- For the NFS 06 Road corridor, ECO:LOGIC and the District met the USFS District Ranger and it was concluded that this alignment also meets the feasibility requirements.
- The environmental constraints analysis showed that both alternative transmission main corridors have no major environmental or permitting related "fatal flaws".
- ECO:LOGIC also met with Suddenlink Communications and Southwest Gas to discuss the potential to participate with the District in a joint utility project. Both parties expressed interest in the project, and as this project goes to preliminary planning, permitting, and design, would like to be contacted to discus a partnership.
- ECO:LOGIC also contacted NV Energy (formerly Sierra Pacific Power Company), but they did not offer any firm opinion of showing interest in a joint utility project.



LEGEND

- WATER PURVEYOR BOUNDARY
- FOREST SERVICE ROAD 6
- HWY 89 ALIGNMENT
- U.S. FOREST SERVICE CORRIDOR ALTERNATIVE
- TDPUD EXISTING PIPELINES
- TTSA ALIGNMENT
- TERMINAL STORAGE RESERVOIR
- BOOSTER PUMP STATION
- (W) POTENTIAL WELL LOCATIONS

2000' 1000' 0 2000'
FULL SIZE PAPER 22" x 34"
1" = 2000'

2000' 1000' 0 2000'
HALF SIZE PAPER 11" x 17"
1/2" = 2000'

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SQUAW VALLEY PUBLIC SERVICE DISTRICT

ALTERNATIVE/SUPPLEMENTAL WATER SUPPLY AND ENHANCED UTILITIES FEASIBILITY STUDY

SHEET TITLE:
FACILITIES MAP & ALIGNMENT CORRIDORS

JOB #	SQAW07-007
DATE	AUGUST 2009
SCALE	AS SHOWN
DESIGNED	KDA
DRAWN	RJG
CHECKED	DTH

FIGURE NUMBER
ES-1

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Squaw Valley Public Service District - Alternative/Supplemental Water Supply and Enhanced Utilities Feasibility Study

Technical Memorandum No. 1 – Final

Water Demand Projections and Water Supply Needs

Prepared For: Richard Lierman, General Manager

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Reviewed By: John Enloe, P.E.

Date: September 29, 2009

1.1 PURPOSE

This technical memorandum estimates the District's supplemental water supply needs to meet build out average annual (AAD) and maximum day (MDD) water demands. Also presented are the water demands for the current water purveyors within the Martis Valley Groundwater Basin (MVGB).

1.2 DISCUSSION

1.2.1 SVPSD SUPPLEMENTAL WATER SUPPLY REQUIREMENTS

Future buildout water demands for the District are based on the *Squaw Valley Groundwater Development and Utilization Feasibility Study, 2003 (Groundwater Study).* The *Groundwater Study* estimated the future buildout AAD and MDD water demands for the District's service area at 1,628 acre-ft/yr (AFA) and 2,525 gallons per minute (gpm), respectively.

The supplemental supply needed is based on the difference between the District's 2007 water demands and the estimated buildout demands presented in the *Groundwater Study*. The 2007 water demands were chosen because they are comparable with the last several years of the District's water usage. In 2007, the District's AAD and MDD were 419 AFA and 574 gpm respectively. Based on this difference, it is estimated that the District will need to supplement their water supply with an additional 1,210 AFA on an average annual basis and 1,951 gpm to meet the buildout MDD. The majority of the District's supplemental water supply demand would be generated by high density residential. Table 1-1 provides a summary of the supplemental water supply requirement.

Table 1-1
AAD and MDD Supplemental Water Supply Requirements

	Demand	District's 2007 Pumping	Supplemental Water Supply Needed
Average Annual Demand (AAD) at Buildout [(a)] [acre-ft/yr]	1628		
2007 SVPSD Pumping [acre-ft]		419 [(b)]	
Supplemental water required to meet the AAD at buildout			1210 acre-ft/yr
Maximum Day Demand (MDD) at Buildout [(c)] [gpm]	2,525		
2007 SVPSD MDD [(d)] [gpm]		574	
Supplemental water required to meet MDD at buildout			1951 gpm

(a) The AAD required at Buildout was taken from Squaw Valley Groundwater Development & Utilization Feasibility Study Update (2003).

(b) The 419 acre-ft was the 2007 production for the District from wells 1R, 2, 3, 5R, and the horizontal wall.

(c) The MDD required at Buildout was taken from Squaw Valley Groundwater Development & Utilization Feasibility Study Update (2003).

(d) The 2007 MDD was taken from the 2007 Capacity and Reliability Study Update.

1.2.2 MVGB Water Purveyors Basin Buildout Demands and Water Availability

Currently, there are four major water purveyors/parties that pump water from the MVGB. They include:

- Truckee Donner Public Utility District (TDPUD)
- Northstar Community Services District (NCSD)
- Placer County Water Agency (PCWA)
- Other Purveyors (Donner Creek Mobile Home Park, Ponderosa Golf Course, Teichert Aggregates, and other individual well owners)

There have been several studies completed in the past several years that have estimated the buildout demand for each one of these water providers. The *TDPUD Urban Water Management Plan Buildout (2005)* estimated the average annual buildout water demands for the TDPUD at 14,880 AFA.

In addition, the *Technical Memorandum and Net Depletion for Martis Valley Groundwater Basin (2001)* prepared by Dave Antonucci estimated future AAD buildout for the NCSD, PCWA, Teichert Aggregates, and private wells at 7,610 AFA.

With the changes in development plans in the Martis Valley PCWA, NCSD, and TDPUD have recently adjusted their buildout water demands. Table 1-2 summarizes each agency's current estimated buildout water demands.

Table 1-2
MVGB Estimated Buildout Water Demands

Agency	Original Estimated Water Demand (AFA) [(a)]	Revised Estimated Water Demands (AFA)	Difference (AFA)
NCSD	2,530	2,690 [(b)]	Increase 160
PCWA	3,922	2,671 [(c)]	Decrease 1,251
Other Purveyors	1,158	1,158	0
TDPUD	14,880	14,880	0
Total	22,490	21,399	Decrease 1,091

(a) Technical Memorandum and Net Depletion for Martis Valley Groundwater Basin (2001)
TDPUD Urban Water Management Plan (2005)

(b) Email correspondence with Eric Martin on 6/9/2008

(c) Email correspondence with Brian Martin on 6/2/2008

Table 1-2 suggests that even if TDPUD and the Other Purveyor's ADD buildout figures remain the same, the overall reduction in ADD buildout figures from the agencies that draw from the MVGB would nearly cover the necessary 1,210 AFY of AAD buildout required by the District. PCWA's estimated reduction of 1,251 AFY alone offsets the amount of water the District needs to satisfy their buildout demand.

Technical Memorandum No. 2 – Groundwater Availability in the Martis Valley details the various studies that have been completed to estimate the sustainable yield of the MVGB.

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Squaw Valley Public Service District - Alternative/Supplemental Water Supply and Enhanced Utilities Feasibility Study

Technical Memorandum No. 2 – Final

Truckee River Side Drainages Evaluation

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Reviewed By: David Hunt, P.E.
John Enloe, P.E.

Date: September 29, 2009

2.1 PURPOSE

This technical memorandum presents a discussion of the evaluation of certain tributaries, or side drainages, along the Truckee River as potential water supplies to Squaw Valley. The investigation looked at the potential for producing groundwater from wells within these drainage areas.

2.2 SUMMARY

A component of the supplemental water supply investigation included the review of potential well sites in drainages tributary to the Truckee River in the Highway 89 corridor between Truckee and Squaw Valley. The "side drainages" evaluated, Silver Creek, Deer Creek, Pole Creek, Deep Creek and Cabin Creek, flow into the Truckee River along Highway 89 (Figure 2-1). The drainages have a different hydrogeologic setting than the Martis Valley, and their potential to produce significant groundwater is largely unknown.

Groundwater in the vicinity of the side drainages is developed by domestic or campground wells located near the mouth of each drainage where it enters the Truckee River canyon. The wells are predominantly completed in volcanic bedrock, or within an overlying layer of glacial outwash or till. These areas near the Truckee River were the focus of the investigation. Although sites for groundwater development may also exist in the upper portions of the creeks away from the river, physical access for drill rigs and infrastructure would likely be difficult or costly, so these areas were not investigated.

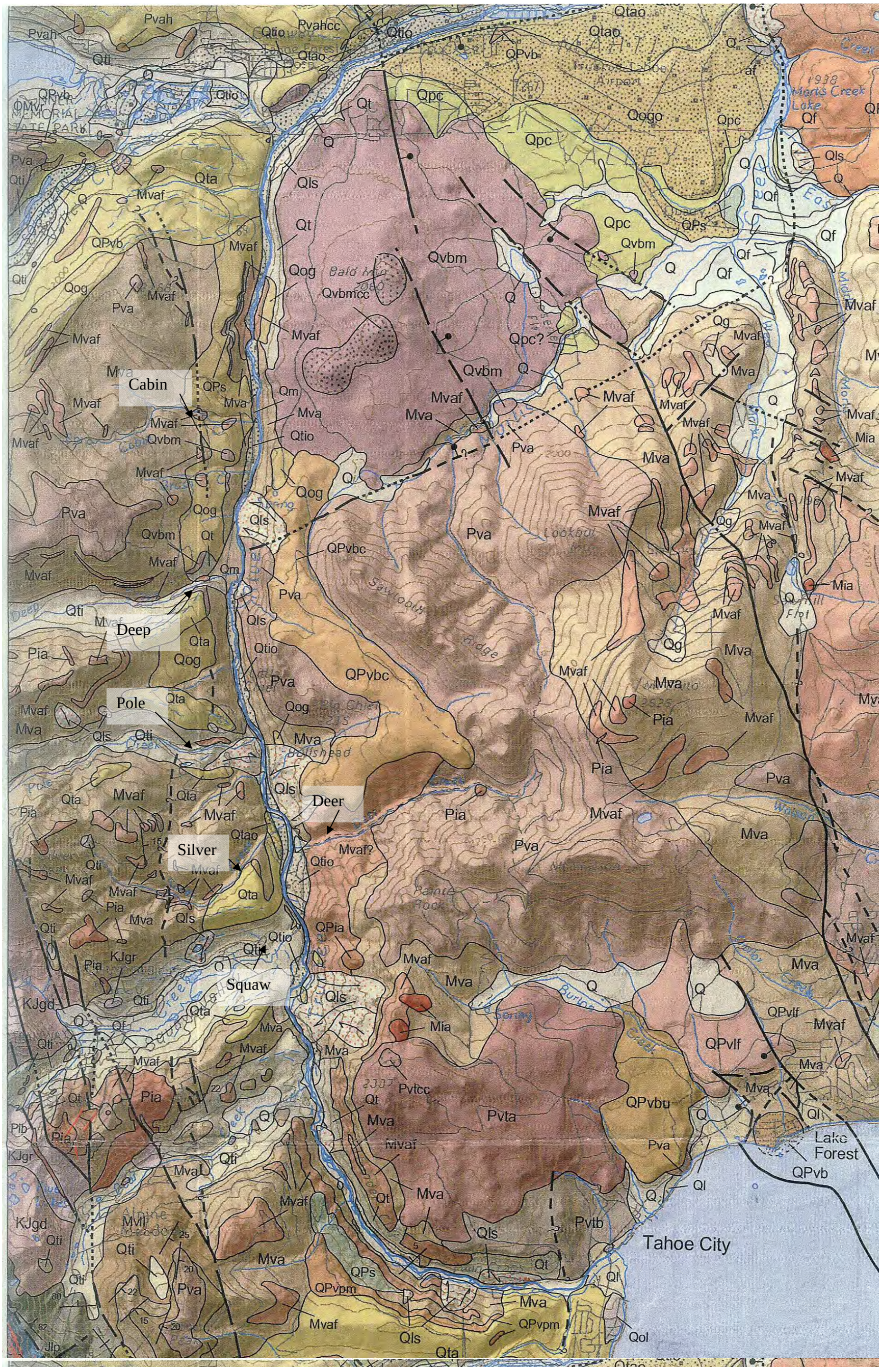


Figure 2-1
Geologic Map of the Upper Truckee River area

ECO:LOGIC completed field inspections of each drainage on November 21, 2007. Prior to the field inspection, topographic maps, aerial images (from Google Earth) and the geologic map of the area were reviewed. Well logs for the existing wells, and parcel and land ownership maps were not available at the time, although some well logs were provided at a later date. Unless posted as private property, it was assumed that most land in the area is public land managed by the US Forest Service.

As shown in Figure 2-1, the geology of the upper Truckee River corridor and the side drainages includes a predominance of volcanic rocks locally overlain by alluvial or glacial deposits (mostly till). Granite may be present near the head of the valleys west of the river. Wells completed in volcanic bedrock can have variable production depending on the type of volcanic rock in which they were completed. In general, volcanic rocks have lower primary permeability than alluvial sediments, and must be subject to post-deposition fractures or faults (in brittle units) to enhance their secondary porosity and groundwater production potential. Wells drilled in unwelded volcanic tuffs or agglomerates, which tend to contain clays and be more ductile, generally produce limited water, even from fault zones. Furthermore, permeable fractured zones must be extensive and connected to a source of groundwater recharge, or pumping will rapidly dewater them.

Water produced from volcanic rock can have variable quality. After some of the older volcanic rocks in the Truckee River corridor were deposited, hot spring/geothermal activity locally existed in the area. As hot water moved along faults and fractures, it changed the composition of the rocks, a process known as “hydrothermal alteration”. The alteration is indicated by areas of bluish-grey rock containing sulfide minerals, or yellow and orange colored rocks. The alteration often added deleterious substances such as manganese, iron, sulfur or arsenic to the rock. Consequently, wells completed in hydrothermally-altered rocks may produce water that does not meet drinking water standards.

2.3 RESULTS OF FIELD INSPECTIONS

2.3.1 SILVER CREEK

Silver Creek is located immediately north of Squaw Valley and hosts a small perennial stream. At one time, a surface water supply system operated near the mouth of the canyon, and one or more small concrete dams were constructed, which fed water into a small steel pipeline (later replaced by a PVC pipeline). Two small buildings containing equipment for operating the water pipeline are also present. The water was piped out of the canyon, but it is unknown where the water was used.

Access, Existing Houses and Wells

A narrow road was at one time present along the south side of the creek which provided access to the water system, dams and buildings. This road is now largely overgrown and there is currently no vehicle access into the canyon itself.

Several older cabins are present south of the creek, while a relatively modern home is present on the north bank of the creek. Directly across Highway 89, the Silver Creek Campground is present. A water supply well is present in the campground, but no information was available on the geology or water quality. A second, hand-pumped well is present, which was labeled "Water not tested, do not drink". It is unknown if the sign indicates that the well produces poor quality water. No well logs were available for area wells.

Geology

Alluvial

As shown on Photograph 2-1, there is a very thin to non-existent layer of glacial outwash at the mouth of Silver Creek, although thicker alluvial materials are present to the east at the Silver Creek Campground.

Bedrock

Bedrock geology in the Silver Creek drainage consists of variably hydrothermally-altered volcanic rocks. This type of alteration resulted from movement of hot water along faults and fractures, which changed the mineralogy of the rock and resulted in bluish-grey, yellow or reddish colors. Frequently, elevated concentrations of iron, manganese, arsenic, sulfur and other deleterious substances are present in this type of altered rock and water produced from wells drilled into the rock may not meet drinking water standards.

Other outcrops on the side of the canyon were less altered than those in the stream bed itself, which may indicate that the stream locally follows a narrow altered fault zone.

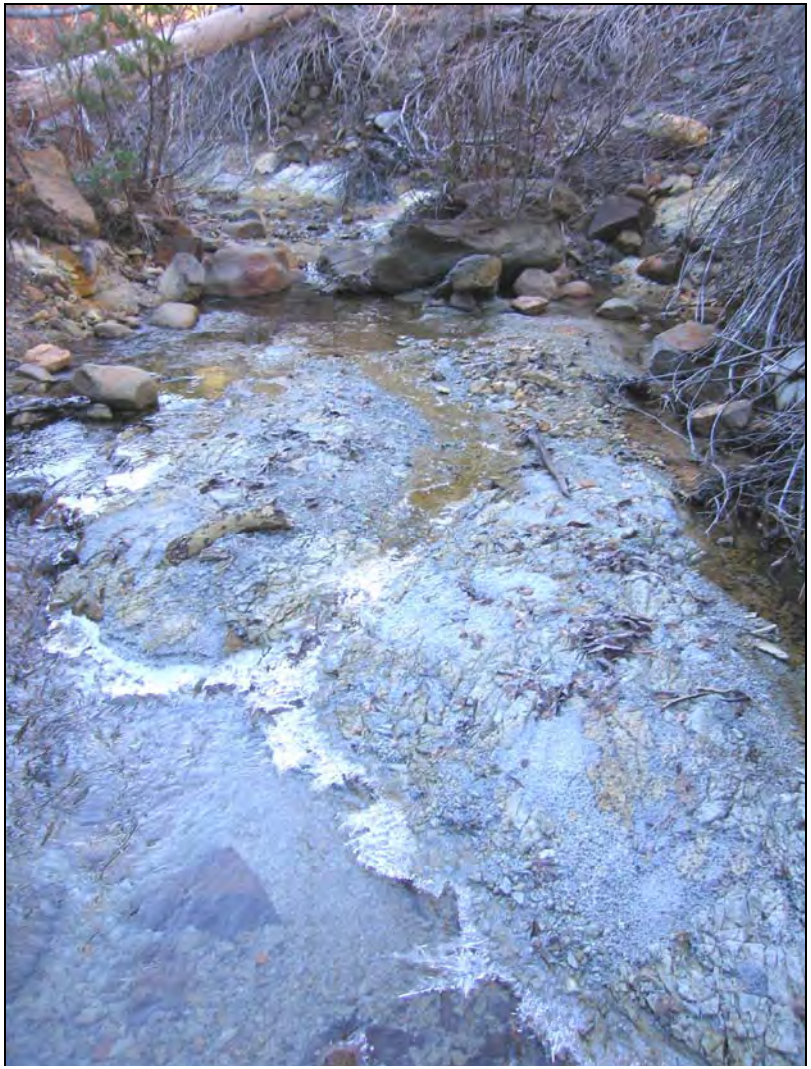
Potential Drill Sites

The Silver Creek drainage appears to have poor groundwater production potential. Drilling sites at the mouth of the creek would be limited to the shoulder of Highway 89, which is likely not feasible. North and south of the creek, the proximity of private residences could restrict drilling from those areas. Water quality issues are likely due to locally altered bedrock.

2.3.2 DEER CREEK

Deer Creek is located on the east side of the Truckee River. The mouth of the creek exits the range several hundred feet from the Truckee River, but then flows over a bench of glacial outwash that hosts a manicured estate of large log homes before entering the river (Photograph 2-3). No well logs were made available for area wells.

The lower reach of the creek was not inspected because of the estate at the mouth of the creek, and because access appeared to be via a private bridge which was posted with no trespassing signs. However, a reconnaissance of the upper reaches of the Deer Creek drainage was made by accessing US Forest Service roads originating in Martis Valley.



Photograph 2-1
Bluish-grey (unoxidized) and orange (oxidized), hydrothermally-altered volcanic bedrock in the bottom of the Silver Creek drainage.

Photograph 2-2
Old well in Silver Creek Campground with "Do Not Drink" label.

Photograph 2-3
Homes located where Deer Creek enters the Truckee River. Deer Creek canyon is in background.

Geology

Alluvial

There is a bench of glacial outwash at the mouth of Deer Creek that is likely relatively thin. This bench appears to be private property and is developed with lawns surrounding large homes. Alluvial deposits are virtually absent in the upper reaches of the drainage basin.

Bedrock

The geologic map indicates the primary bedrock geology in the Deer Creek canyon is older Miocene andesite flows. The map symbol is queried for the lower portion of the drainage likely because extensive hydrothermal alteration is present in the area. Large areas of yellowish-altered outcrop are visible on the aerial photographs on the north side of the drainage, and on the south side a peak named Painted Rock is present. Rick Lierman stated that some mine tailings are also present in the valley, and that ground water quality in the area is thought to be poor.

Potential Drill Sites

The lower Deer Creek drainage appears to have poor groundwater production potential due to limited access, large private estates at the mouth of the canyon, and hydrothermally-altered volcanic bedrock in the creek drainage, which likely generates poor quality groundwater. Forest Service roads originating in Martis Valley do provide access to upper Dear Creek canyon for

drilling equipment and there is at least one site where an exploration well might be drilled with minimal pad preparation. This site is located near the southeast corner of Section 14, approximately 1.5 miles southwest of Mount Pluto and one-half mile northwest of Mount Watson. The geologic materials in this area comprise the older Miocene andesitic rocks, described above, that typically yield only moderate quantities of groundwater to wells, unless they have been highly fractured as a result of faulting. The site is situated on a linear northwest-trending topographic feature aligned with upper Martis Creek. But, no fault corresponding to this lineament has been mapped, suggesting no geologic structure is present that might enhance the yield of a well at this site. Drilling and test pumping of an exploratory well are required to determine if an anomaly exists at this site that might result in a higher than expected well yield at this locale.

2.3.3 POLE CREEK

Pole Creek, a perennial stream, is located about one mile north of Silver Creek on the west side of the Truckee River. As shown in Photograph 2-4, the main access route to the canyon is on a well-graded gravel road located on the south side of the creek. The start of this road is less than 500 feet west of the Truckee River. The road extends several miles into the canyon and is relatively well traveled. From Highway 89 the road climbs fairly steeply for about ¼ mile, makes two switchbacks, and then traverse across a relatively large, flat bench before climbing again.

Several signs were present further up the canyon, apparently placed by the USFS. One sign describes the ban on fishing in the creek due to introduction of endangered Lahontan cutthroat trout; a second describes landslide restoration efforts in the area; while a third described sensitive deer fawning areas.

Existing Houses and Wells

Homes exist both north of the creek and on the east side of Highway 89. No well logs were available.

Geology

Alluvial

The geology at the mouth of the creek consists of a relatively large landslide deposit that extends across the Truckee River. The creek has mostly eroded down through these deposits. Further up the stream canyon, glacial till is mapped in the canyon bottom, while a veneer of slightly older glacial till caps volcanic rock on either side of the creek canyon.

Photograph 2-4
Aerial photograph of Pole Creek drainage.

Bedrock

The geologic map indicates the creek has eroded into Miocene, andesitic volcanic rocks. Significant hydrothermal alteration was not observed in the creek area, although some is present in roadcuts south of the creek.

Potential Drill Sites

Limited drilling sites are present near Pole Creek. A parking area near the base of the access road next to Highway 89 is a possibility, although it is located very close to the highway. The bench of land just west of the first switchbacks has flat areas atop the landslide deposits where a drill rig could set up. However, the land appears to be USFS property, and there may be significant issues associated with the area due to its heavier recreation and wildlife use. Further, the bench area, although mapped as landslide deposits, may be underlain by altered volcanic rocks. Water quality issues are possible.

2.3.4 DEEP CREEK

Deep Creek, a perennial stream, is located about 1.5 miles north of Pole Creek on the west side of the Truckee River. A private home is located at the mouth of the creek on the west side of Highway 89. The main access route to the canyon is a gravel 4WD road located on the south side of the creek. An unlocked USFS gate is present across that road, about ¼-mile west of Highway 89. The creek has formed a narrow, steep canyon, and the road is located one hundred or more feet above the creek bed. Access to the private parcel is from a driveway located north of the creek.

Photograph 2-5
View of portion of private parcel at the mouth of Deep Creek. The parcel is relatively flat and has sites where a well could be completed a sufficient distance away from both the creek and the Truckee River.

Existing Houses and Wells

The private home, which includes a guest house and well, is located on a relatively flat, 9.6-acre parcel west of Highway 89 at the mouth of Deep Creek. The parcel is for sale, and could be used as a site for a production well. The owner provided a well log and water quality analyses from three samples collected from both the well and from two interior taps. Apparently, the well water flows through a filtration system before it enters the buildings. As shown in Table 2-1, the groundwater at this location has moderate total dissolved solids and is a sodium-bicarbonate type. Iron exceeded the drinking water standard at the well head, but apparently is removed by the

home's filtration system. Inside the home, however, manganese exceeded the drinking water standard. The well is 200 feet deep and was initially airlifted at more that 50 gpm. When sampled in May 2007, the well had 29 gpm of artesian flow. Well geology is described in the following section.

Table 2-1
Well and Water Quality Data [(a)] [(b)]

Parameter	Goose Meadow Well	Domestic Well	Domestic Well Kitchen after filter	Domestic Well Guest House after filter
Depth Drilled	380 feet	200 feet		
Volume (gpm)	10 gpm airlift from bottom	29 gpm flowing artesian		
pH	7.2	6.65	6.61	6.83
TDS	NA	355	326	345
Ec (umhos/cm)	NA	320	320	340
Bicarbonate	**1,020**	206	201	206
Total Alkalinity	**840**	167	165	169
Hardness	125	20	18	6
Calcium	28.1	4.8	4.6	0.92
Magnesium	13.3	2	1.7	0.99
Sodium	**380**	60.3	55.5	63
Manganese	**0.59**	<0.05	**1.27**	<0.05
Iron	**1.14**	**2.34**	0.07	0.58
Arsenic	NA	<0.01	<0.01	<0.01
Nitrate	ND	<0.5	<0.5	<0.5
Fluoride	ND	0.22	0.25	0.23

(a) All results in ppm (mg/l) unless noted.
(b) Values in bold exceed drinking water standards.

Across Highway 89, numerous small homes and cabins are present along the Truckee River and south of Deep Creek. North of these houses, and along Deep Creek itself, is the Goose Meadows Campground. A water supply well is present in the campground, and a well log and water quality analysis were provided by the USFS. The well geology is described in the following section. The well only air-lifted 10 gpm from the bottom, and the water quality was poor and contained high concentrations of bicarbonate (1,020 mg/L), sodium (380 mg/L), iron (1.14 mg/L) and manganese (0.059 mg/L). Total dissolved solids (TDS) and arsenic were not reported, but based on the information provided, the TDS is likely in the range of 1,800 mg/L. The analysis also reported elevated hardness (125 mg/L). The results are unusual when compared to the private residence across the street, as the concentrations of all the major cations and bicarbonate in the private well are roughly 5 to 6 times lower than in the Goose Meadows well. As described in the next section, the domestic well produces water largely from unaltered basalt, while the campground well appears to produce water largely from clay-altered volcanic rock.

Geology

Alluvial

The geology at the mouth of Deep creek and the 9-acre parcel is mapped on Figure 2-1 as either Glacial till (Qti) or Quaternary Mudflow deposits (Qm). The ground surface appeared to consist largely of cobbles and boulders. Near the mouth of the creek, the material is exposed in a steep bank, and is mostly sand, gravel and rounded cobbles (Photograph 2-6). Mudflow deposits also cover the surface at the Goose Meadows campground. The well log for the Goose Meadows campground well was obtained from the Truckee Ranger District, which indicated that the boulder and gravel deposits are about 47 feet thick, and underlain by clay and volcanic rock. The well log for the private residence indicated that clay, and cobbles with clay, were present to a depth of 16 feet, and were underlain by basalt.

Photograph 2-6
Lower portion of Deep Creek just west of the highway, showing course materials in the stream bed, and rounded gravels and cobbles mapped as either glacial till or mudflow deposits.

Bedrock

The log for the Goose Meadows campground well indicated that the bedrock is dominantly blue, red, brown and pink clay, with lesser volcanic conglomerate and other volcanic rock to the total depth of 380 feet. These materials are likely those mapped in the area as Mva (Miocene lahars, flows, breccia and volcaniclastic sediments). These rocks are also present south of Deep Creek along the west side of Highway 89, where they are fractured and variably altered (Photograph 2-7). Wells completed in these materials could produce poor quality groundwater.

The well log for the private residence indicated that the bedrock is black "basalt" that was fractured from 140 to 145 feet bgs and from 160 to 190 feet bgs. This material is apparently that shown in Figure 2-1 as Qvbm (Bald Mountain Olivine Latite), which was mapped near the residence in two thin strips on either side of Deep creek. The clayey volcanic rocks in the Goose Meadows well were not present, although they may underlie the latite at unknown depth. Because these rocks are not altered, the well produces better quality groundwater, although it still does not meet drinking water standards. During drilling, groundwater was first reported from the fractured zone beginning at 140 feet. The static water level after drilling rose to 5 feet below the surface, but artesian flow was not reported. The flowing conditions reported when the well was sampled (in May of 2007) may be seasonal.

Photograph 2-7
View of volcanic rock in road cut south of Deep Creek that has been variably altered along faults and fractures.

Potential Drill Sites

Flat areas suitable for well drilling exist on the 9-acre private parcel at the mouth of Deep Creek canyon. Groundwater produced from the well at the private residence does not meet drinking water standards for iron and possibly manganese, but it is vastly better quality than that produced from the campground well to the east. The volume of water that could be produced from a municipal well at the property is unknown, but aquifer parameters could be estimated by completing an aquifer stress test on the well, or if not possible, on a new test well. Because the well produces water from a fractured rock aquifer, a 10-day constant discharge test would be

recommended. The principal reason for extended-duration testing is that the well is located within fractured rock and the aquifer is likely bounded by numerous geologic contacts. Fractured-rock hydraulics are fairly complicated and projecting the long-term performance of a well in this terrain on the basis of a short-term test has resulted in over-estimating the available water supply at other locations throughout the Sierras. An extended pumping test would provide a higher level of confidence in the amount of water that a production well could provide over the long term.

2.3.5 CABIN CREEK

Cabin creek is a small perennial stream present in a steep narrow drainage. It is located about 1.5 miles north of Deep Creek on the west side of the Truckee River. A paved road is present just north of Cabin Creek which leads about one mile in a north-northwesterly direction, away from the creek and toward to the regional landfill. The road receives relatively heavy vehicle traffic. A few dirt 4WD side roads are present off the paved road, which provide limited access to the Cabin Creek drainage. A second, smaller, unnamed drainage is present immediately north of the Cabin Creek Road. This stream was dry during the site visit.

Existing Houses and Wells

A few houses are present on the south side of the creek and just off of Highway 89. Numerous other houses are present east of the highway and along the Truckee river.

Geology

Alluvial

A veneer of glacial till is present near the creek and surrounding areas. It is underlain at shallow depth by volcanic bedrock.

Bedrock

Bedrock near the creek is mapped as various andesitic volcanic rocks. A large outcrop of andesite is present across from cabin creek road and on the east side of Highway 89, although it is not shown on the geologic map (Photographs 2-8 and 2-9). The rock is not altered. Similar volcanic rocks are likely to underlie glacial till in the area.

Photograph 2-8
View of turnoff to Cabin Creek Road.

Photograph 2-9
View of volcanic rock in road cut across from Cabin Creek Road.

Groundwater Production Potential and Drill Sites

Any wells drilled in this area would be completed almost entirely within volcanic bedrock. Although apparently unaltered, significant groundwater production would only occur if large fault or fracture zones, connected to a source of recharge, were present. The closest possible drill site is located on a small spur off of the Cabin Creek road, a few hundred feet from Highway 89. The site is considered to have low potential for producing significant groundwater. Further, concerns could exist because the regional landfill is present less than a mile upgradient of the site.

2.4 CONCLUSIONS AND RECOMMENDATIONS

Based on the mapped geology, field observations, and known groundwater quality issues along the Truckee River, none of the drainages investigated appear to be particularly favorable for production of groundwater for use as a water supply for Squaw Valley, and some of the sites are considered unfavorable. All of the sites have relatively thin alluvial aquifers underlain at shallow depth by volcanic bedrock which may have either low permeability or poor water quality.

The site with the best potential appears to be the private parcel at the mouth of Deep Creek Canyon. The surface geology includes permeable boulders, cobbles and gravels, while the well produces water from fractured, but apparently unaltered volcanic rocks. A large area of flat ground is available for drill rig access that is more than 500 feet from the creek and the Truckee River; a power line is present; and it would be relatively easy to pipe water from the site. Water quality samples indicate that iron and possibly manganese exceed drinking water standards, and the volume of water that could be reliably produced from a production well at the site is unknown. Because the site's well produces groundwater from a confined, fractured-rock aquifer, an extended-duration pumping test of up to 10 days would be necessary to evaluate the aquifer's hydraulic parameters. A pumping test on the well, or on a new test well, should be completed before the district considers purchasing the property.

A second site may exist in the headwaters of Deer Creek. The geologic materials in this area typically do not yield large quantities of groundwater to wells. However, the site is aligned with a northwesterly-trending linear feature in the topography coincident with upper Martis Creek which may or may not have any significance. Drilling and testing an exploratory well in the headwaters of Deer Creek would be required to determine if this linear feature represents a geologic anomaly that might result in higher than expected well yield.

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Squaw Valley Public Service District - Alternative/Supplemental Water Supply and Enhanced Utilities Feasibility Study

Technical Memorandum No. 3 - Final

Groundwater Availability in the Martis Valley

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John Enloe, P.E.

Date: September 29, 2009

3.1 PURPOSE

The purpose of this technical memorandum is to:

- Summarize the available groundwater resources in the Martis Valley Groundwater Basin (MVGB);
- Assess whether or not there are sufficient groundwater resources in the basin to accommodate supplying water to the Squaw Valley Public Service District (District);
- Discuss the implications of the Truckee River Operating Agreement (TROA);
- Discuss the District's right to water from the MVGB
- Determine whether or not there is excess capacity in existing municipal water supply wells in Martis Valley that can be used to meet the Squaw Valley supplemental water supply needs; and
- Discuss potential new well sites in the MVGB.

3.2 DISCUSSION

3.2.1 AVAILABLE GROUNDWATER RESOURCES

The study area encompasses a portion of the MVGB (Figure 3-1). The groundwater resources of the MVGB are discussed in a number of documents. These include:

- Hydro-Search, Inc., 1975. *Availability of ground water*: consulting report prepared for Truckee Donner Public Utility District.

- Hydro-Search, Inc., 1980. *Truckee and vicinity ground-water resource evaluation*: consulting report prepared for Dart Resorts, Inc.
- Hydro-Search, Inc., 1995. *Ground-water Management Plan, Phase 1, Martis Valley Ground-Water Basin, Basin No. 6-67, Nevada and Placer Counties*: consulting report prepared for Truckee Donner Public Utility District.
- Nimbus Engineers, 2000. *Ground water resource evaluation*: consulting report prepared for Truckee Donner Public Utility District.
- Nimbus Engineers, 2001. *Ground water availability in the Martis Valley Ground Water Basin, Nevada and Placer Counties*: consulting report prepared for Truckee Donner Public Utility District, Placer County Water Agency, and Northstar Community Services District.
- Kennedy/Jenks Consultants, Cordilleran Hydrology, Inc. and Todd Engineers, 2002. *Independent analysis of Martis Valley ground water availability Nevada and Placer Counties, California*: consulting report prepared for Martis Valley property owners.
- InterFlow Hydrology, Inc, and Cordilleran Hydrology, Inc., 2003. *Measurement of ground water discharge to streams tributary to the Truckee River in Martis Valley, Placer and Nevada Counties, California*.
- Truckee Donner Public Utility District, 2005. *Truckee Donner Public Utility District Urban Water Management Plan*.

The water resources of a groundwater basin can be summarized in a water budget, which is an accounting of inflows to and outflows from the basin. The various documents listed above provide a range of values for the various components of the water budget for the MVGB. A water budget for the MVGB is summarized in Table 3-1. It is adapted from the work completed by Nimbus Engineers for the Truckee Donner Public Utilities District (TDPUD), Placer County Water Agency (PCWA), and Northstar Community Services District (NCSD). For a basin that is in equilibrium, the inflows should be balanced by the outflows. The budget illustrated in Table 3-1 is, for all practical purposes, in balance (within approximately 1%).

Many of the components of a water budget have a degree of uncertainty associated with them. This can be seen in a comparison of the estimates of recharge arising from precipitation falling on the basin and groundwater discharge to the Truckee River presented by Hydro-Search [1995] and Nimbus Engineers [2001]. For example, Hydro-Search estimated 18,179 acre-feet per year of recharge from precipitation versus Nimbus's estimate of 23,744 AF/yr. Likewise, Hydro-Search estimated groundwater discharge to the Truckee River as 8,170 AF/yr versus Nimbus's estimate of 20,207 AF/yr.

From Table 3-1, the total "natural" recharge to the basin arising from infiltration of precipitation is 29,165 AF/yr (sum of 23,744 AF/yr direct infiltration from precipitation falling on the basing, 5,336 AF/yr subsurface inflow, and 85 AF/yr infiltration from streams). Nimbus [2001] concluded that 24,700 AF/yr of groundwater ". . . is available in the Martis Valley Groundwater Basin."

Table 3-1
Martis Valley Groundwater Basin Water Budget [(a)]

Component	Acre-feet per year
Inflow	
Subsurface inflow to the basin (from Northstar watershed, Martis Peak watershed, and Donner Lake Watershed)	5,336
Direct infiltration of precipitation falling within the basin	23,744
Infiltration of treated effluent (effluent from TTSA, including Effluent from sewage imported into the basin)	5,433
Septic system return flow	485
Infiltration of surface water	85
Total Inflow	**35,083**
Outflow	
Discharge to the Truckee River	20,207
Evaportranspiration (vicinity of Martis Creek)	1,540
Discharge via municipal and industrial wells	7,062
Discharge from domestic wells	180
Discharge from springs (Ponderosa Golf Course and Juniper Flat)	1,494
Discharge to Alder Creek, Prosser Creek, Prosser Reservoir, and Juniper Creek	3,603
Subsurface outflow (to the east in the vicinity of Hirschdale)	692
Total Outflow	**34,778**

(a) After Nimbus, 2000 & 2001 and Kennedy/Jenks, *et al*., 2002)

A more recent investigation (InterFlow Hydrology, Inc., and Cordilleran Hydrology, Inc., 2003) suggests the basin may be capable of sustaining up 34,000 AF/yr of groundwater extractions. After careful consideration of all the available information, the TDPUD Urban Water Management Plan [2005] concluded ". . . it is reasonable to assume, that, at a minimum, the 24,000 AFY of [ground] water cited in the Nimbus study is available to support development in Truckee and the surrounding areas.

3.2.2 GROUNDWATER RESOURCES POTENTIALLY AVAILABLE FOR SUPPLY TO SQUAW VALLEY

The exploitation of groundwater as a source of water supply typically results in the capture of groundwater discharge (Bredehoeft, 1997. Safe Yield and the Water Budget Myth: Ground Water, Vol. 35, No. 6 Nov.-Dec, 1997). Groundwater resource development has ". . . almost nothing to do with recharge. . ." Increasing groundwater extractions in the Martis Valley should be expected to capture more of the groundwater discharge. As indicated in Table 3-1, natural groundwater discharge to the Truckee River, ET, and groundwater outflow may total 26,042 AF/yr. For consistency with the TDPUD Urban Water Management plan [2005], this study will assume 24,000 AF/yr as a first approximation of the quantity of groundwater available to support development.

The TDPUD Urban Water Management Plan [2005] indicated a buildout water demand for all water producers in the MVGB is 22,490 AF/yr. The difference, or 1,510 AF/yr (24,000 AF/yr minus 22,490 AF/yr) is potentially available for other uses not included in the buildout scenario.

The buildout water demand for the MVGB has recently been revised downward by a reduction in buildout development within the PCWA service territory to 21,399 AF/yr (see Table 1-2 TM #1 – Water Demand Projections). If this estimate is correct, there may be as much as 2,600 AF/yr (24,000 AF/yr minus 21,399 AF/yr) of groundwater in the MVGB potentially available for other uses, including as a potential water supply for Squaw Valley.

The investigation by InterFlow Hydrology, Inc. and Cordilleran Hydrology, Inc. [2003] concluded there may be as much of 10,000 AF/yr of groundwater discharge to tributary streams in the MVGB not accounted for in the water budgets suggested in previous investigations, bringing the total resource to 34,000 AF/yr. Therefore, the amount of groundwater over and above that needed for buildout and potentially available for other uses might be as high as 11,510 to 12,600 AF/yr.

The range of estimates of groundwater resources potentially available for supply to Squaw Valley are summarized in Table 3-2.

Table 3-2
Groundwater Resources Potentially Available for Export to Squaw Valley

	Based on Estimated Water Demands 2005 TDPUD Urban Water Management Plan		Based on Revised Estimated Water Demands	
Available resource (AF/yr)	24,000 [(a)]	34,000 [(b)]	24,000 [(a)]	34,000 [(b)]
Buildout Demand (AF/yr)	22,490 [(c)]	22,490 [(c)]	21,399 [(d)]	21,399
Available resource (AF/yr)	1,510	11,510	2,601	12,601
Squaw Valley Buildout Demand (AF/yr)	1,210 [(e)]	1,210	1,210	1,210

(a) Lower limit of estimated resource (2005 TDPUD Urban Water Management Plan, Nimbus [2001])
(b) Upper limit of estimate of resource (InterFlow Hydrology, Inc. and Cordilleran Hydrology, Inc. [2003])
(c) Source: TDPUD Urban Water Management Plan (2005)
(d) Revised MVGB buildout demands
(e) TM No. 1 – Water Demand Projections

Table 3-2 indicates that there are adequate water resources in the MVGB to provide groundwater in amounts sufficient to meet the buildout demand for District, even for the most conservative estimates of the available resource and buildout demand in the MVGB.

Truckee River Operating Agreement

In 1990 Congress passed, and on November 16, 1990, the President of the United States signed into law Senate Bill 3084, which contains the Truckee-Carson-Pyramid Lake Water Rights Settlement Act (Title II of PL 101-618). Section 204 of the Act addresses the equitable apportionment of the waters of the Truckee River, Carson River, and Lake Tahoe between the State of California and the State of Nevada and it became effective upon the effective date of the

Truckee River Operating Agreement (TROA) which is required to be negotiated under Section 205 of the Settlement Act. TROA was signed on September 6, 2008. The California allocation for the Truckee River basin downstream of Lake Tahoe as described in Section 204(c) allocates 32,000 AF/yr of water from all natural sources, including both surface and groundwater, in the Truckee River basin. One condition of this allocation includes a maximum annual diversion of surface supplies not exceed 10,000 acre-feet. Enforcement of the California/Nevada interstate allocation of water is left to the states to monitor and manage the allocation of water within their respective jurisdictions. The determination of the safe yield of groundwater basins is left to the US Geological Survey, but as an interim and potentially permanent alternative to developing those studies, TROA has imposed a consumptive use limit of 17,600 acre feet per year. Disputes arising over the enforcement of the interstate allocations are subject to adjudication through the federal court system.

Article 6 of TROA includes a calculation of depletion as a parallel measure of compliance with the interstate allocation contained in the Settlement Act. The depletion calculation specified in TROA Section 6.E does not supersede the Settlement Act provisions, but it does provide a mechanism to more appropriately account for such things as reservoir storage and management, effluent reuse, and aquifer storage and recovery. The California Truckee River Basin depletion is not to exceed 17,600 acre feet per year, which is 55 percent of the California allocation of water. For a typical mix of residential and commercial water uses, the 17,600 acre foot depletion limit would significantly impact diversions. The 17,600 acre foot consumptive limit is designed to limit diversions of water if the consumptive uses of the community grow beyond those typically seen in urban settings. Increased consumptive use uses such as pond evaporation, effluent reuse or extensive landscaping will tend to increase the consumptive use and may lead to triggering this limit on the use of water in the basin. At the projected water demand for the year 2033 of 22,700 acre feet (Nelson, 2003), the consumptive use limit should not come into play for the Truckee River Basin unless the future uses of water are more consumptive than typically seen for residential and commercial uses in the area. The majority of the District's supplemental water supply demand would be generated by high density residential, which has a limited consumptive use. Based on this, a large proportion of the groundwater exported to Squaw Valley will be returned to Martis Valley as secondary recharge from infiltration of effluent from TTSA. Assuming 85% of the 1,210 AF/yr is returned to the basin, the consumptive use will be only 181.5 AF/year.

Article 10 of TROA addresses the design and location of wells in California within the Truckee River basin (downstream of Lake Tahoe) to provide well construction standards and setbacks from water bodies so that they are "designed to minimize any short-term reductions of surface streamflows to the maximum extent feasible" as required by the Settlement Act. The requirement for wells to be designed to minimize short-term reductions of surface streamflows took effect with the signing of Settlement Act (PL 101-618) in 1990. Many wells constructed or planned for construction after 1990 are specifically enumerated in TROA as being conclusively presumed to comply with the requirements of the Settlement Act.

Wells that are not enumerated in TROA and are constructed in the interim period between the enactment of the Settlement Act in 1990 and the effective date of TROA remain subject to the requirements of the Settlement Act, and are bound by the construction and location standards in TROA section 10.B.2 when it becomes effective. Those standards are specific for each of the defined "Special Zones". Wells constructed in this interim period that fail to comply with TROA section 10.B.2 are subject to court ordered repair or abandonment if they cannot be modified to comply with 10.B.2.

When TROA becomes effective, a "Notice of Intent" process will be implemented for the construction of new wells. After the filing of a Notice of Intent describing the location (including GPS coordinates and certain specified maps), setbacks, design parameters (including but not limited to depth, depth of the surface seal, and intended capacity), and owner information, construction of the well may be commenced upon compliance with regulations of the appropriate local jurisdiction.

The well location and design criteria in TROA section 10.B.2 are not onerous and do not significantly impact the drilling of wells in the Tahoe-Truckee Sanitation Agency Special Zone, the Truckee Donner Public Utility District/Martis Valley Special Zone and the Northstar/Placer County Special Zone, provided that the appropriate setbacks are maintained. The major design criterion listed in 10.B.2 is a well seal depth requirement that is present in some of the special zone standards. When present in a zone standard, the well sealing requirement is a specified depth or it is to the first aquitard. The imposition of a well sealing depth requirement may impact well capacity in some areas, but it is a convenient definition for a design that is intended to "minimize any short-term reductions of surface streamflows to the maximum extent feasible".

District's Right to Water from the MVGB

There are two issues associated with the District's right to export MVGB water to the Olympic Valley. These include limitations under California groundwater law and quantity limitations as set forth in TROA. A 2007 letter from attorney Janet Goldsmith to Mal Toy (PCWA) provided detailed explanations of these issues and is discussed below.

Under California water law the use of Martis Valley groundwater by the District as well as by TDPUD, PCWA and NCSD is considered an appropriation of groundwater (an export not directly serving overlying landowners in the basin of origin). As appropriators from the MVGB they may only take water in excess of that necessary to serve the overlying lands. The 2007 letter indicated that "the limitation of appropriable water to the surplus over the needs of overlyers and prior appropriators creates uncertainty about the long-term availability of water for export". Based on this uncertainty, it is recommended that the District work with PCWA and/or TDPUD to agree upon a long term allocation of potentially available water supplies from the MVGB.

TROA allows for the allocation of 32,000 AF/yr, of which not more than 10,000 AF/yr can be surface water, for water supply in the Truckee River basin. The California-Nevada and Watershed Assessment Section for the Central District of the Department of Water Resources

(CNWAS), as part of the TROA EIS development and in preparation for their ongoing responsibility in tracking and reporting diversions and depletions under TROA, has identified water use estimates for the Basin. In June 2003, the CNWAS prepared a letter (Nelson, 2003) identifying the current water use in 2002 and the projected water use for the year 2033 in the Truckee River and Lake Tahoe Basins of California. The total groundwater and surface water demand projected for the Truckee River Basin in 2033 was estimated by CNWAS to be 22,700 acre feet. According to the chief engineer of the CNWAS, the Department of Water Resources does not expect the water demand in the Truckee River Basin to grow to the 32,000 acre foot allocation in the foreseeable future and that the demand projection contained in the 2003 letter remains valid (Sarna, 2008).

3.2.3 EXPORT WATER SUPPLY ALTERNATIVES

There are two reasonable alternatives for developing sources of groundwater in the MVGB that might be supplied to Squaw Valley. One alternative entails obtaining water from the TDPUD, PCWA, or NCSD, assuming of course, these water purveyors possess excess well capacity. The other is for District to construct a new well or wells in the MVGB expressly for this purpose.

Excess Capacity from Existing Resources

TDPUD

The TDPUD requires four new wells to meet their buildout demand (Ed Taylor, personal communication, 2008). Consequently, they do not have excess production capacity that might be supplied to Squaw Valley.

PCWA

The groundwater derived from the PCWA Zone 4 system (Martis Valley Water System) that provides the supply for the Lahontan, Siller Ranch, and Timilick subdivisions are fully committed (Brian Martin, 2008. Personal communication). Consequently, PCWA has no excess well capacity to provide a source of water to Squaw Valley.

However, the subdivisions served by the PCWA system are only partially built out at this time and the wells currently are used to provide a small portion of the PCWA system buildout demand. There may be an opportunity to provide at least some of the District's demand in the interim and should be pursued during the next phase of this project.

Northstar Area

The NCSD's current water supply includes a surface water source and an existing groundwater well, TH-2. The NCSD's long term plans include the construction of two additional wells, TH-1 and TH-3, to meet buildout water demands. The expected capacity of the future wells is 500 gpm each. Similar to the PCWA system, the area served by NCSD does not require the full use of the existing water resources. Therefore, there may be an opportunity to provide a portion of the District's demand in the interim until such time the demands in the NCSD service area increase.

Another potentially available groundwater resource in the Northstar area comes from Northstar at Tahoe's snow making supply. Recently, the ski area began using snow making water from the Martis Camp Irrigation Wells #1 and #2. These wells currently pump directly into the snow making system. These wells are also permitted by CDPH as a surface water source for the NCSD to be treated at the water treatment plant. At this time, excess summer capacity from these wells cannot be utilized as the snow making pipelines are not able to be used to convey a potable water supply. Although the NCSD can use this water as an available surface water source, the existing water treatment plant is only rated for 700 gpm and any excess capacity that could be conveyed to the District would require a major plant capacity upgrade.

New Resources

Hydro-Search [1995] subdivided the MVGB into four areas on the basis of probable well yield. These are:

A1 - probable well yield greater than 1,000 gpm
A2 - probable well yield 500 to 1,000 gpm
A3 – probable well yield 100 to 500 gpm
B – probable well yield less than 100 gpm

The primary area of interest is A1 because of the potential for a single well in this area to meet Squaw Valley's buildout demand. TDPUD's "Airport Well" and "Martis Valley Well No. 1" (2,000 and 1,725 gpm respectively) are located in this zone. Also completed in zone A1 are PCWA's two "Lahontan" wells, the irrigation well for the Lahontan Golf Course, and the two Larwin-Joerger test wells drilled for Dart Industries. However, because the subsurface geology is relatively complex, there is no guarantee of high-well yields everywhere in this zone, as evidenced by the yields of test and production wells drilled for the Timilick subdivision. The two production wells which will be incorporated into the PCWA system may be rated to yield approximately 300 to 400 gpm.

Two areas have been targeted for further consideration as production well sites. The sites can be seen in Figure 3-2. These include:

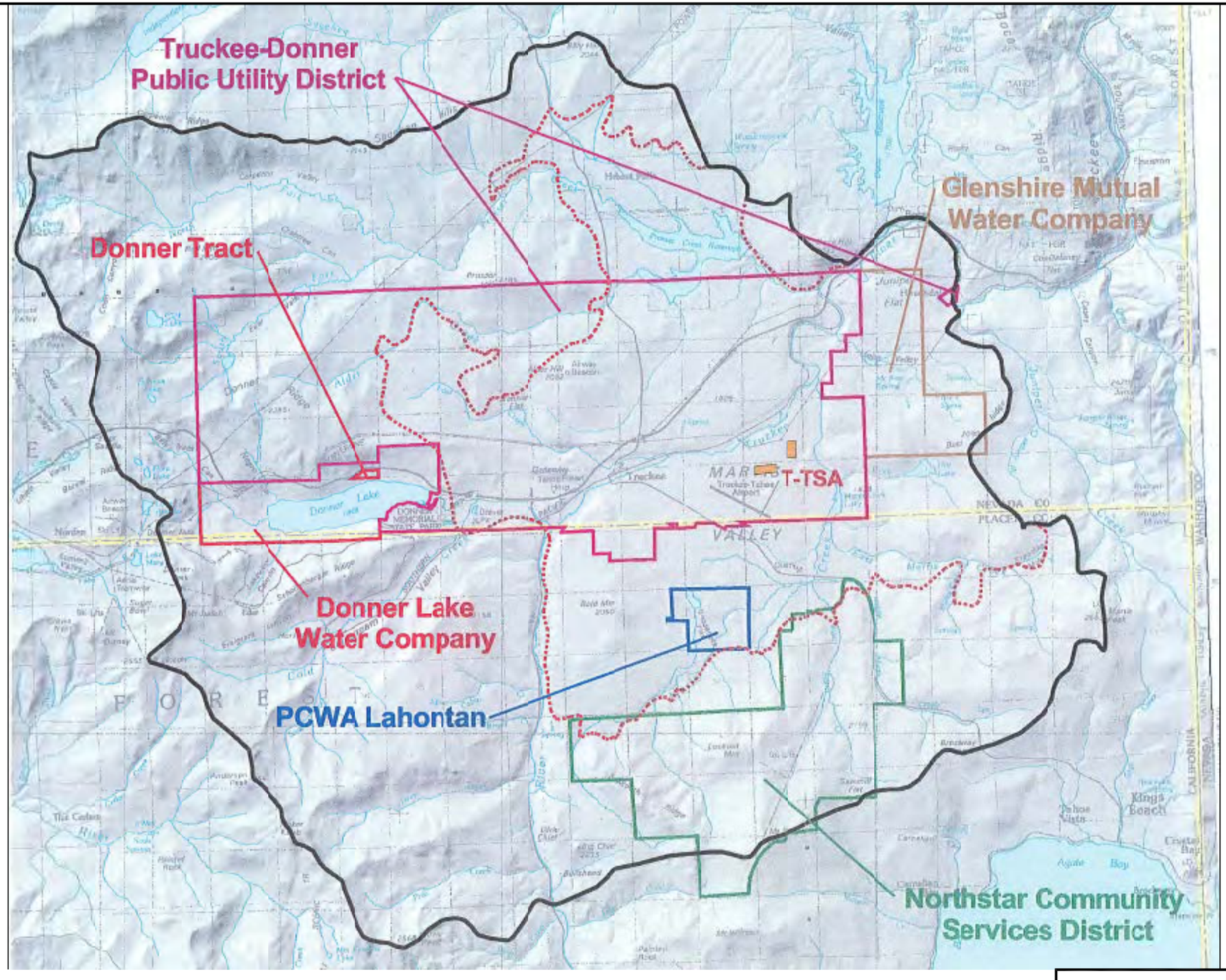
- A parcel of land owned by the Airport Authority located near the intersection of Schaeffer Mill Road and State Route 267. This site is located approximately 1,500 feet southwest of TDPUD's Airport Well.
- The Sayers-Tong property located between Shaeffer Mill Road and State Route 267.

Prospective well sites will need to be evaluated through a comprehensive exploratory drilling and testing program. In addition to addressing the probable yield of production wells, the testing program would be expected to yield information related to the potential for the new wells to interfere with the existing TDPUD and PCWA wells. At this stage, interference is expected to be minimal because there does not appear to be significant interference between Martis Valley Well No. 1 and the Airport Well (David Carlson, 2008. Personal communication). Interference with future wells can be minimized by careful placement of the well(s) constructed to meet the District's supply. Interference between wells will be affected by the somewhat

compartmentalized nature of the basin. The previous geologic investigations of the basin referenced above and analysis of aquifer-stress test data by ECO:LOGIC from a number of wells suggest the presence of multiple faults that impede, but not prevent, groundwater flow between adjacent aquifer "compartments." This helps to minimize interference between wells completed in different areas of the basin. The flip side is that drawdown in a particular compartment will be greater than if the boundaries did not exist.

Likewise, the Truckee River appears to act as a hydrologic divide, separating the southern half of the basin from the northern half. So long as groundwater exploitation does not capture all of the discharge to the river, it should continue to act to prevent groundwater development south of the river from affecting water levels north of the river, and vice versa.

The proposed wells sites are located in the Northstar / Placer zones identified in TROA. They appear to be located sufficiently far from streams, ephemeral streams, ponds and lakes to be presumed to be in compliance with TROA. Field investigations to pin down the precise well locations will include evaluations to confirm this assumption.



LEGEND

- WATERSHED BOUNDARY
- MARTIS VALLEY GROUND WATER BASIN

500' 250' 0 500'
FULL SIZE PAPER 22" x 34"
1" = 500'

500' 250' 0 500'
HALF SIZE PAPER 11" x 17"
1/2" = 500'

NOTE:

THIS FIGURE IS FROM THE NIMBUS "GROUND WATER AVAILABILITY IN THE MARTIS VALLEY GROUND WATER BASIN REPORT 2001"

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SQUAW VALLEY PUBLIC SERVICE DISTRICT

ALTERNATIVE/SUPPLEMENTAL WATER SUPPLY AND ENHANCED UTILITIES FEASIBILITY STUDY

FIGURE TITLE: **MARTIS VALLEY GROUNDWATER BASIN**

JOB #	SQAW07-007
DATE	AUGUST 2009
SCALE	AS SHOWN
DESIGNED	KDA
DRAWN	RJG
CHECKED	DTH

FIGURE NUMBER **3-1**

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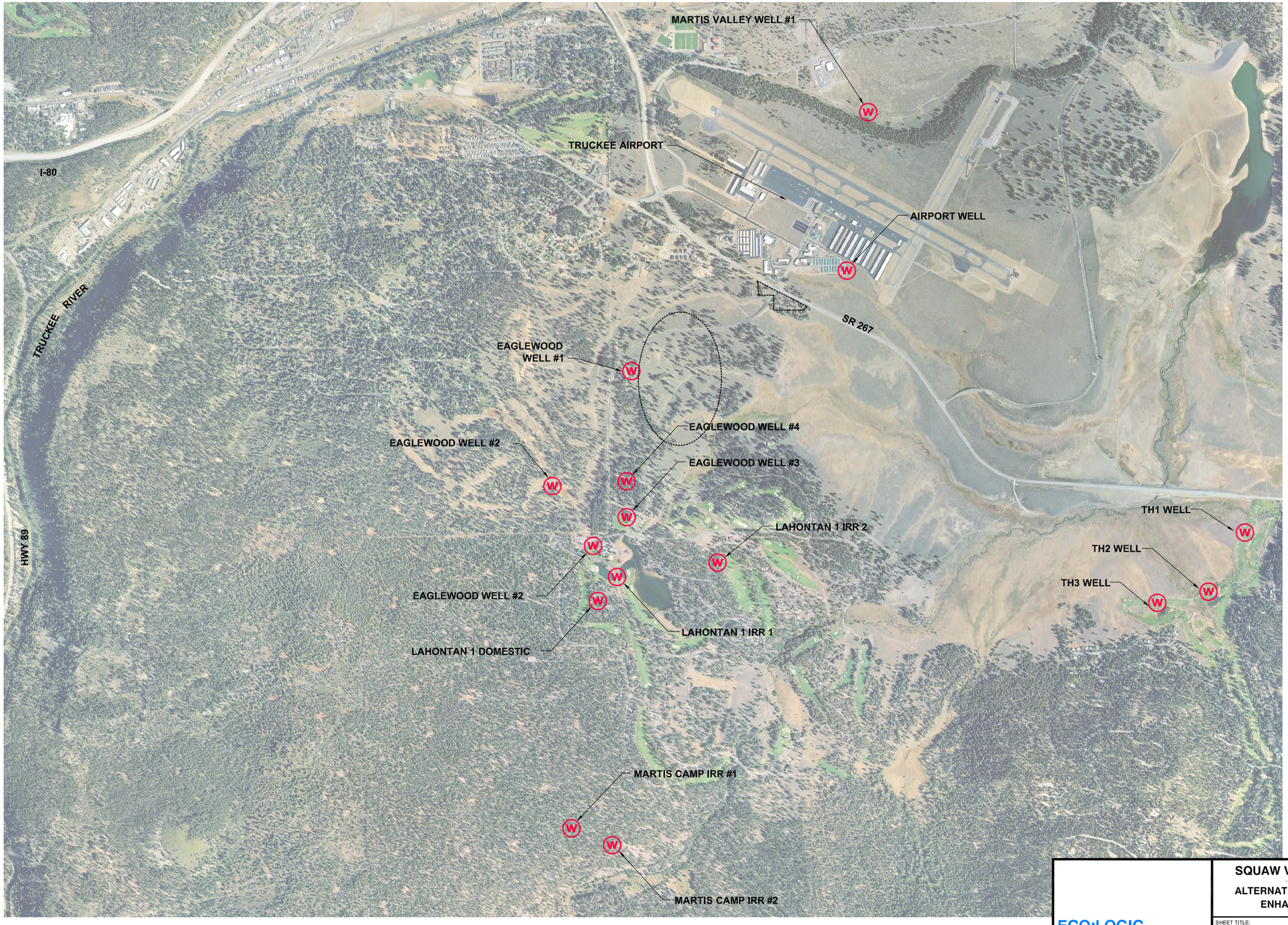

1000' 500' 0 1000'
FULL SIZE PAPER 22" x 34"
1" = 1000'

1000' 500' 0 1000'
HALF SIZE PAPER 11" x 17"
1/2" = 1000'

NOTE:

AREAS UNDER CONSIDERATION AS PRODUCTION WELL SITES

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SQUAW VALLEY PUBLIC SERVICE DISTRICT

ALTERNATIVE/SUPPLEMENTAL WATER SUPPLY AND ENHANCED UTILITIES FEASIBILITY STUDY

SHEET TITLE:
EXISTING MVGB WELLS AND POSSIBLE PRODUCTION WELL LOCATIONS

JOB #	SQAW07-007
DATE	AUGUST 2009
SCALE	AS SHOWN
DESIGNED	KDA
DRAWN	RJG
CHECKED	DTH

FIGURE NUMBER
3-2

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Aug 17, 2009 - 3:26pm

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Squaw Valley Public Service District - Alternative/Supplemental Water Supply and Enhanced Utilities Feasibility Study

Technical Memorandum No. 4 - Final

Transmission Main Alignment Evaluation

Prepared For: Richard Lierman, General Manager

Prepared By: Ken Angst, P.E.
David Hunt, P.E.

Reviewed By: John Enloe, P.E.

Date: September 29, 2009

4.1 PURPOSE

The purpose of this technical memorandum (TM) is two fold:

- Evaluate the feasibility of alternative alignments for the imported water supply;
- Discuss other opportunities with local area utilities to assess their desire to participate in the project utilizing a joint trench.

4.2 DISCUSSION

4.2.1 POTENTIAL ALIGNMENT CORRIDORS

ECO:LOGIC investigated three different alternative alignments to route water from the Martis Valley/Truckee area to Squaw Valley. These alternative alignments require Squaw Valley Public Service District (District) to partner with Placer County Water Agency (PCWA), Truckee Donner Public Utilities District (TDPUD), or a combination of both. In addition, these alignments will have to transverse through one or a combination of the following alignment corridors:

- Highway 89 corridor between Truckee (Highway 80) and Squaw Valley;
- United States Forest Service (USFS) Road 6 corridor;
- Truckee Tahoe Sanitation Agency (TTSA) existing sewer line easement (between Squaw Valley and Truckee, parallel to the Truckee River).

4.2.2 POTENTIAL WATER SUPPLY/ALIGNMENT OPTIONS

The alternatives examined include:

- Water supply through the TDPUD water system and new transmission main along the Highway 89 corridor;
- Water supply through the PCWA Zone 4 water system and new transmission main along the USFS corridor.

Figure 4-1 shows the alternative alignment corridors along with the PCWA and TDPUD water system boundaries.

The feasible water supply options discussed with TDPUD, PCWA, and NCSD include the following:

- TDPUD supplying water to the District through its existing infrastructure;
- PCWA/NCSD supplying water to the District through TDPUD infrastructure;
- PCWA/NCSD supplying water to the District through the Zone 4 system existing infrastructure; or
- The District wheeling water through either the PCWA or TDPUD system and supplying water to Squaw Valley through facilities owned and operated by the District.

Any of the options would require the District to construct a number of new water supply facilities including a new water supply well, booster pump station, transmission main, and terminal water storage tank in Squaw Valley.

TDPUD and Highway 89 Corridor Alternative

In this alternative, the District would finance and drill a well within the one of the two areas indicated in TM No. 3 – Groundwater Availability in the Martis Valley. Water would be wheeled through TDPUD's existing water system infrastructure beginning near the well site to one of two connection points (Figure 4-2):

- The intersection of Highway 80 and Highway 89 (near the intersection of Donner Pass Road);
- The intersection of Highway 89 and West River Road.

The connection at the intersection of Highway 80 and Highway 89 would be within the TDPUD's 6,170 foot pressure zone. The connection at West River Street would be within TDPUD's 6,040 foot pressure zone. A booster pump station would be required at either one of these locations to supply the water to the District's 6,460 foot pressure zone in Squaw Valley. The booster pump station would be equipped to pump up to 2,000 gpm with approximately 150 horsepower pumps.

From these locations, a new pipeline would be constructed along the shoulder of Highway 89 South for approximately 8-9 miles towards Squaw Valley. The pipeline would terminate at a new water storage tank north of Squaw Creek and the Painted Rock subdivision as shown in Figure 4-2.

This alternative presents several challenges including: addressing current concerns of residents of Truckee, determining if the TDPUD water distribution system can convey 2,000 gpm to Squaw Valley, and traversing through the Caltrans right-of-way along Highway 89. First, a number of residents in the Prosser Lake area are concerned because the water levels in some of the individual homeowner's wells have declined. While the cause and extent why the water levels in these well have declined is not known, the residents have become protective of their water supply. Even though the District would drill the well and dedicate it to the TDPUD, this alternative may generate the public perception that the TDPUD is providing water to an outsider while ignoring the needs of one of its neighbors.

Second, Ed Taylor of the TDPUD has confirmed that the current water models indicate the TDPUD's system has enough capacity in the existing system to wheel the 2,000 gpm through their system.

During the feasibility study, ECO:LOGIC met with the Caltrans permitting staff to discuss a possible route through the right-of-way along the Highway 89 corridor. The discussion with the Caltran's representatives was positive. Caltrans does allow utilities within their right of way if it is outside the traveled lanes. The shoulder on the west side of Highway 89 is fairly wide and the transmission main should fit into the shoulder of the highway with minimal disturbance to the traveled lanes. The Caltrans representatives gave ECO:LOGIC the following conditions that must be satisfied in order for the alignment to be approved. These conditions included:

- Investigating several different alternatives in addition to the use of Caltrans right of way along Highway 89. The burden would be on the District to prove that there is a significant cost savings along the Highway 89 corridor versus the USFS corridor before the project could be approved;
- Determining if other utilities (Southwest Gas, SPPCo, SuddenLink fiber) would be interested in a joint utility project;
- Performing the required environmental documentation (EIR)
- Meeting all the requirements under the Caltrans "Special Funded Projects";
- Coordinating with the State of California to address traffic concerns.

The above requirements came out of the meeting with Caltrans and ***should not*** be consider the only requirements necessary to gain approval. Additional discussions with Caltrans would be necessary to indentify all the necessary requirements. In addition, Technical Memorandum No. 5 - Environmental Constraints Analysis, provides an in-depth analysis on the environmental and permitting requirements that would be necessary for this alignment.

PCWA/NCSD and United States Forest Service (USFS) Corridor Alternative

In this alternative, the District would finance and drill a well either in the Truckee Airport or Lahontan Subdivision areas (Figure 4-3), or utilize excess available capacity from NCSD's TH-1, TH-2, and/or TH-3 wells, if available. Utilizing the option of new wells near the airport of the Lahontan subdivision, water would be piped from near Highway 267, up Schaefer Mill Road to PCWA's existing water tanks within the Zone 4 water system. If the project is phased, smaller flows could be wheeled through PCWA's existing infrastructure. Buildout flows would require a new or parallel pipeline up Schaefer Mill Road to meet the buildout 2,000 gpm. With NCSD sources, the water would be piped from the wells up Highway 267 and Schafer Mill Road and into the PCWA system. Conveying water through NCSD's existing water system infrastructure is not feasible as this would require major capacity upgrades to the distribution system.

A new booster pump station would be required adjacent to the PCWA water tanks to convey water to Squaw Valley. The existing tanks have an operating hydraulic grade of approximately 6,300 feet. The terminal tank location in Squaw Valley has a hydraulic grade of 6,460 feet. The USFS alignment as shown in Figure 4-3 has a high point of approximately 7,200 feet. The booster pump station would therefore be much larger than the Highway 89 option, with pumps sized in the 500 horsepower range to provide the 2,000 gpm buildout capacity. The pipeline along this route would be a high pressure line with operating pressures up to 400 pounds per square inch (psi).

From the new pump station, the alignment would follow a southeasterly course to connect with the National Forest Service 06 Road (NFS 06). The pipeline would follow the NFS 06 Road, mostly along the existing dirt single lane roadway, until the beginning of Deer Creek. At this point the pipeline would wind down the ridge just south of Deer Creek following a series of existing dirt trails and end up south of Squaw Valley. The pipeline would then continue north along the east side of the Truckee River and cross at one of the existing bridge crossings in the vicinity of the Squaw Valley entrance. After crossing the Truckee River and Hwy 89, the pipeline would terminate at a new water storage tank north of Squaw Creek and the Painted Rock subdivision.

ECO:LOGIC met the USFS District Ranger and staff to discuss potential alignment corridors within USFS rights of way, along with possible environmental constraints. The feedback from the USFS on both construction and environmental permitting issues was positive. Below are a number of the constraints that an alignment along the NFS 06 Road would present to the project team:

- Determining if other utilities (Southwest Gas, SPPCo, SuddenLink fiber) would be interested in a joint utility project;
- Complying with the NEPA standards;
- Attaining a special use permit from the USFS.

Additional discussions with USFS would be necessary to indentify any further requirements at the time of preliminary planning and EIR preparation. In addition, Technical Memorandum #5 - Environmental Constraints Analysis provides an in-depth analysis on the environmental and permitting requirements that would be necessary along the NFS 06 corridor.

This option also presents the same concerns as the TDPUD/Highway 89 alternative with respect to declining water levels in domestic wells in the Prosser Lake area.

TTSA Corridor

The TTSA sewer interceptor runs within an easement parallel to the Truckee River between Tahoe City and the TTSA wastewater treatment plant. The easement is very narrow (10-15 feet wide) and in some places is only 5 feet wide. To place a new water transmission main within this easement, in such close parallel proximity to an existing sanitary sewer line does not meet the intent of California Department of Public Health regulations. Additionally, the TTSA interceptor alignment crosses the Truckee River in several locations, which with the current environmental regulations/laws would be difficult to permit for this water transmission line. Of the three transmission alignment corridors evaluated, the TTSA corridor appears to be an infeasible alternative.

4.2.3 POTENTIAL JOINT TRENCH UTILITY PARTNERS

Suddenlink Communications

ECO:LOGIC met with SuddenLink Communications in Truckee to discuss their interest in joining the project as part of a utility corridor. Suddenlink has already installed an above ground fiber from Truckee to just north of the Silver Creek Campground. They were able to attach their fiber via the existing overhead power lines that travel through the USFS parcels along NFS 6 Road. Suddenlink was forced to stop their fiber north of Silver Creek Campground because they have been unable receive the permission or easements from the private landowners to proceed across Highway 89 and south to Squaw Valley and Alpine Meadows. They have attempted for over three years to get easements to allow them to continue their facilities to the south.

In addition, Suddenlink has fiber installed from North Tahoe to Alpine. They already have cable television and internet customers in Squaw Valley; however, the customers are currently getting their cable/internet via microwave signals from Alpine Meadows. The microwave signals are affected by the weather particularly during the winter and can take several days to fix when an outage occurs. Thus, Suddenlink is aggressively pursuing a route that allows them to complete their fiber run from the Silver Creek Campground to Squaw Valley and Alpine Meadows. They are interested in participating in a joint trench with the District; however, if another opportunity to run their fiber presents itself prior to the implementation of the District's supplemental water supply project, they will pursue that option first.

Dave Woods of Suddenlink said they may be still interested in a joint trench project that would run from Truckee to Squaw Valley because of liabilities associated with running a fiber above

ground through the USFS land. However, an internal scope of cost would have to be performed by Suddenlink to determine if a joint trench option would be financial feasible.

If Suddenlink were to participate in the joint trench, they would run two 4 inch conduits and need pull-boxes every 1,000 ft. They would pay for their cost up-front.

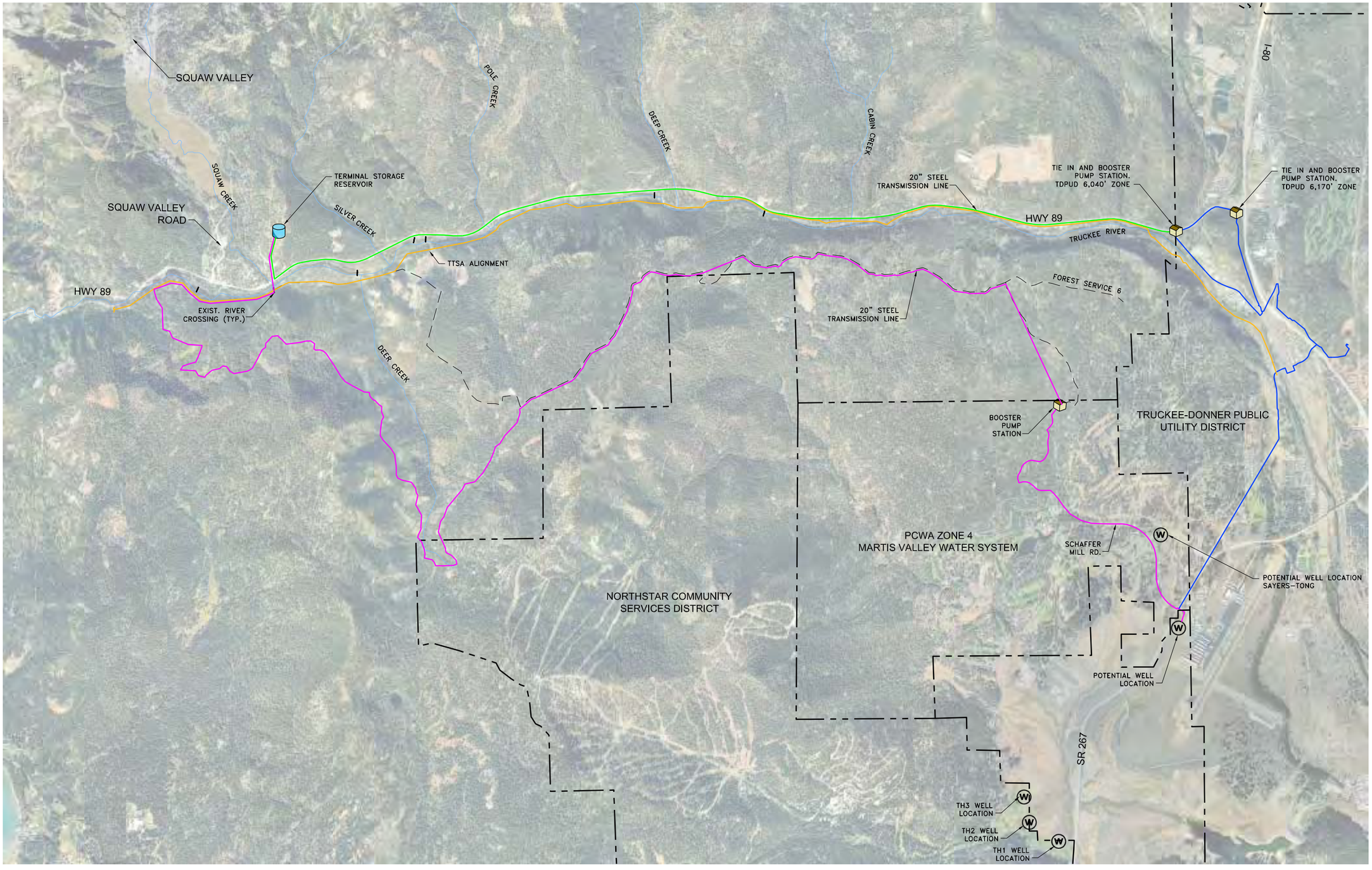
Southwest Gas (SWG)

ECO:LOGIC also met with SWG to discuss their interest in joining the project as part of a utility corridor. SWG made it clear that they are not interested in paying out of pocket up front expenses for new infrastructure. Their company policy requires a third party to fund the necessary infrastructure to get natural gas to new customers. Only after new customer's sign up for service will SWG provide a reimbursement check to the third party. The reimbursement program will only occur for a ten year period, after which SWG would not provide any further reimbursement to the third party. SWG requires a 5.4 year payback period on all new infrastructure in California.

With this being said, SWG is interested in participating in a joint trench project with the District. If the project were to move forward, SWG would perform a survey of the Squaw Valley residents to determine the level of interest in natural gas. After this survey is completed, SWG would prepare a cost estimate for their infrastructure needs.

SWG representatives said there could be enormous costs in trenching residential neighborhoods because of the geological conditions. The cost could be equal to or exceed the cost of the trench to get a natural gas stub from Truckee to the entrance of Squaw Valley at Highway 89. In addition, many residential customers in Squaw Valley would have to spend thousands of dollars to retrofit their existing propane piping in order to receive natural gas. SWG suggested that new construction in Squaw Valley have piping installed for natural gas. Natural gas requires larger pipe diameters than propane. Therefore, natural gas piping systems are capable of delivering propane to the residents while giving flexibility to the residents in the future to switch over to natural gas. Several of the new developments have built natural gas piping systems anticipating the eventual conversion to natural gas.

If a project were to occur, SWG said their infrastructure would need to include an 8" high pressure steel main with cathodic protection.



LEGEND

- WATER PURVEYOR BOUNDARY
- FOREST SERVICE ROAD 6
- HWY 89 ALIGNMENT
- U.S. FOREST SERVICE CORRIDOR ALTERNATIVE
- TDPUD EXISTING PIPELINES
- TTSA ALIGNMENT
- TERMINAL STORAGE RESERVOIR
- BOOSTER PUMP STATION
- (W) POTENTIAL WELL LOCATIONS

2000' 1000' 0 2000'
FULL SIZE PAPER 22" x 34"
1" = 2000'

2000' 1000' 0 2000'
HALF SIZE PAPER 11" x 17"
1/2" = 2000'

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SQUAW VALLEY PUBLIC SERVICE DISTRICT

ALTERNATIVE/SUPPLEMENTAL WATER SUPPLY AND ENHANCED UTILITIES FEASIBILITY STUDY

SHEET TITLE: ALTERNATIVE ALIGNMENT CORRIDORS

JOB #	SQAW07-007
DATE	AUGUST 2009
SCALE	AS SHOWN
DESIGNED	KDA
DRAWN	RJG
CHECKED	DTH

FIGURE NUMBER 4-1

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LEGEND

- WATER PURVEYOR BOUNDARY
- FOREST SERVICE ROAD 6
- HWY 89 ALIGNMENT
- U.S. FOREST SERVICE CORRIDOR ALTERNATIVE
- TDPUD EXISTING PIPELINES
- TERMINAL STORAGE RESERVOIR
- BOOSTER PUMP STATION
- (W) POTENTIAL WELL LOCATION

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SQUAW VALLEY PUBLIC SERVICE DISTRICT

ALTERNATIVE/SUPPLEMENTAL WATER SUPPLY AND ENHANCED UTILITIES FEASIBILITY STUDY

SHEET TITLE:

TDPUD AND HIGHWAY 89 CORRIDOR ALTERNATIVE

JOB #	SQAW07-007
DATE	AUGUST 2009
SCALE	AS SHOWN
DESIGNED	KDA
DRAWN	RJG
CHECKED	DTH

FIGURE NUMBER

4-2

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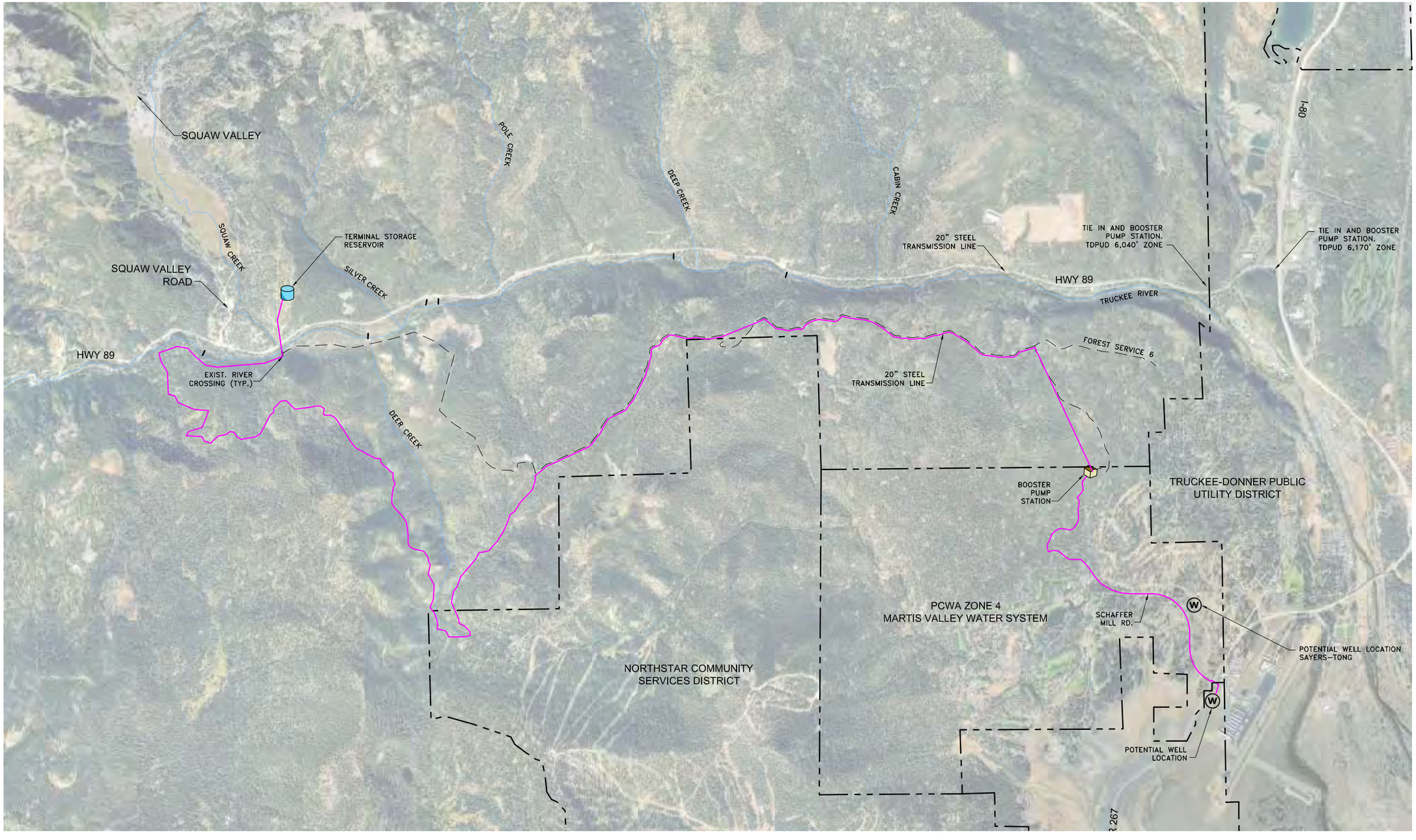

LEGEND

- WATER PURVEYOR BOUNDARY
- FOREST SERVICE ROAD 6
- U.S. FOREST SERVICE CORRIDOR ALTERNATIVE
- TERMINAL STORAGE RESERVOIR
- BOOSTER PUMP STATION
- POTENTIAL WELL LOCATIONS

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SQUAW VALLEY PUBLIC SERVICE DISTRICT

ALTERNATIVE/SUPPLEMENTAL WATER SUPPLY AND ENHANCED UTILITIES FEASIBILITY STUDY

SHEET TITLE:
PCWA AND USFS 06 ROAD CORRIDOR ALTERNATIVE

JOB #	SQAW07-007
DATE	AUGUST 2009
SCALE	AS SHOWN
DESIGNED	KDA
DRAWN	RJG
CHECKED	DTH

FIGURE NUMBER
4-3

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ECO:LOGIC
ENGINEERS · CONSULTANTS

Squaw Valley Public Service District - Alternative/Supplemental Water Supply and Enhanced Utilities Feasibility Study

Technical Memorandum No. 5 - Final

Environmental Constraints Analysis

Prepared For: Richard Lierman, General Manager

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Kimberly Smith
Angela Nguyen-Tan

Reviewed By: David Hunt, P.E.

Date: September 29, 2009

5.1 PURPOSE

The purpose of this environmental constraints analysis is to determine whether there are any major liabilities or fatal flaws that would severely constrain the intended use of the potential water supply pipeline alignments and to assess the routes from an environmental permitting/compliance perspective. The goal is to assist in identifying the most efficient pipeline alignment from an environmental perspective.

In general, based on a literature review, there appear to be no outstanding environmental compliance "fatal flaws" associated with the use of the properties for a water supply pipeline. The installation of a pipeline along either route would require compliance with CEQA (and NEPA-NFS 06 Road Alignment), Clean Water Act Section 401 and 404, Federal Endangered Species Act Section 7, National Historic Preservation Act Section 106, California Endangered Species Act and California Fish and Game Code Section 1600 *et seq.*. The National Forest Service 06 (NFS 06) Road Alignment crosses federal lands (US Forest Service) and Placer County lands which will trigger the need to comply with NEPA (as well as CEQA) and the County's general plan. In contrast, the Highway 89 Route is located in both Placer and Nevada County (Town of Truckee), triggering CEQA and General Plan compliance for both counties and both counties will be considered "responsible agencies" under CEQA.

5.1.1 OBJECTIVES

The objective of this technical report is to assess the potential environmental constraints and permit compliance requirements associated with the development of a potential water supply

pipeline along (A) the National Forest Service 06 Road Alignment (Truckee to Tahoe City) and/or (B) the Highway 89 Alignment (Truckee to the turn off of the Painted Rock subdivision access road). The NFS 06 Alignment is located in the Martis Valley area of unincorporated Placer County. The Highway 89 Alignment begins near the Truckee Airport and passes through the Town of Truckee (Nevada County) to Highway 89 where the potential alignment would be placed in the shoulder of the highway until the access road of the Painted Rock subdivision. Both alignments are shown in Figure 5-1.

Environmental constraints are defined as any issue that could complicate or severely delay the project. Examples include wetlands and other waters of the US, state or federal endangered species habitat, land use designations in conflict with the proposed use, and key archeological or cultural resources. The specific objectives of this study were to (1) identify any documented constraints through literature surveys and (2) define any additional site-specific constraints through local area knowledge. This environmental constraints analysis/feasibility study is (a) a tool for defining the development potential and environmental suitability of the potential project and (b) an advanced planning document to facilitate project preparation and environmental permit streamlining.

5.1.2 POTENTIAL WATER SUPPLY PIPELINE ALIGNMENTS

National Forest Service 06 Road Pipeline Alignment

The National Forest Service 06 Road is located in the Sierra Nevada Mountain Range at an elevation of approximately 6,200 ft. It is located near State Routes 267 (to the east), 89 (to the west), 28 (to the south), and Interstate 80 (to the north) in the unincorporated area south of the Town of Truckee in Placer County (Figure 5-1). The potential pipeline route begins at the Truckee Airport in Martis Valley, immediately north of Highway 267 in Nevada County, California. The new pipeline alignment would be installed under Highway 267 to the south (by use of jack and bore drilling method) and then follow Schaffer Mill Road where it will connect to the existing Timilick development within the PCWA Zone 4 water system along Valhalla Drive, just north of Bald Mountain. The potential pipeline would then follow a southeasterly course to connect with the National Forest Service 06 Road (NFS 06). The pipeline would follow the NFS 06 Road, mostly along the existing dirt single lane roadway, until the beginning of Deer Creek. At this point the pipeline would wind down the ridge just south of Deer Creek following a series of existing dirt trails and end up south of Squaw Valley. The pipeline would then continue north along the east side of the Truckee River and cross at one of the existing bridge crossings in the vicinity of the Squaw Valley entrance. After crossing the Truckee River and Hwy 89, the pipeline would terminate at a new water storage tank north of Squaw Creek and the Painted Rock subdivision (Figure 5-2).

The Forest Service Alignment under consideration encompasses a corridor approximately 15 feet wide and 15.75 miles long from the Truckee airport to the access road of the Painted Rock subdivision (Figure 5-2). The surrounding land uses along the pipeline route include Residential, Forest, and Open Space. The northern portion of the route is a newly developed residential community that used to be Open Space. The mid-section of the potential pipeline route is National Forest following the alignment of NFS 06 road. The southern section of the potential

route crosses High and Low Density residential along the eastern bank of the Truckee River outside of the riparian zone and into Squaw Valley.

Highway 89 Pipeline Alignment

The Highway 89 Corridor is also located in the Sierra Nevada Mountain Range at an elevation of approximately 6,000 ft. It is located along State Highway 89 from the Town of Truckee south to the Painted Rock subdivision entrance. Nearby roadways include Interstate 80 (to the north), State Routes 267 (to the east) and 28 (to the south) (**Figure 5-1**). The potential pipeline route begins near the Truckee Airport in Martis Valley. The project will use Truckee Donner Public Utility District (TDPUD) infrastructure to route the water supply from the airport to Highway 89 south (near the intersection of Donner Pass Road). From this intersection, the pipeline will be placed along the shoulder of Highway 89 for approximately 8 miles, until the turn off at the access road for the Painted Rock subdivision, where it will connect to the District's current infrastructure (**Figure 5-2**).

The Highway 89 Alignment under consideration encompasses a corridor approximately 15-20 feet wide and 8 miles long from the Truckee airport to the entrance of the Painted Rock subdivision (**Figure 5-2**). The surrounding land uses along the Alignment includes Agriculture/Timberland, Low Density Residential, and Highway 89 Right-of-Way. The entire Highway 89 Alignment would be along the wide western shoulder of the highway. This alignment would cross approximately 11 creeks or streams between Truckee and Squaw Valley.

5.1.3 METHODS

ECO:LOGIC staff reviewed existing environmental documentation covering the potential alignment areas (**Figure 5-1**). ECO:LOGIC staff identified possible engineering and environmental constraints regarding the development of the pipeline alignments and thus narrowed the potential site locations to those depicted in **Figure 5-2**. ECO:LOGIC staff then conducted a more refined analysis of the possible environmental constraints/permit streamlining options associated with the potential water supply pipeline routes (i.e. the area depicted in **Figure 5-2**). The resource-specific methods and documents reviewed are described and cited below.

Biological Resources

ECO:LOGIC biologists conducted a desktop survey of the potential project area. The following biological resource documents and sources were reviewed to assess possible biological constraints along the water supply pipeline routes:

- California Department of Fish and Game's (DFG) California Natural Diversity Database (CNDDB) (2008) records search of the Truckee 7.5-minute U.S. Geological Survey (USGS) quadrangle and surrounding areas
- The U.S. Fish and Wildlife Service (USFWS) list of endangered, threatened, and proposed species for Placer and Nevada counties
- National Wetlands Inventory

- Previously prepared environmental documents in the area including:
  - Sierra Nevada Forest Plan Amendment and Supplemental Environmental Impact Statement, Northern Sierra Nevada, California (USDA Forest Service, 2008)
  - Martis Valley Community Plan, Martis Valley, Placer County, California (May 2003)
  - Martis Valley Community Plan Environmental Impact Report, Nevada County, California (May 2003)
  - Nevada County General Plan, Nevada County, California (1996)
  - Placer County General Plan Environmental Impact Report, Placer County, California (1994)
  - Sierra Nevada Forest Plan Biological Assessment (USDA Forest Service, 2008)
  - Squaw Valley Public Service District Aquifer Storage Recovery Program, Squaw Valley (ECO:LOGIC, 2005)
  - Squaw Valley Public Service District Well No.2 Replacement and Water Supply Reliability Project
  - Town of Truckee 2025 General Plan, Truckee, California (1996)
- Personal Communications with Joann Roubique from the USFS
- Placer County General Plan Tree Ordinance
- Aerial photographs of the potential route
- A review of the California Native Plant Society plant list database

Land Use Resources

ECO:LOGIC environmental specialists conducted a desktop survey of the potential project area. The following land use documents and sources were reviewed to assess possible land use constraints along the water supply pipeline route:

- Placer County Code
- Placer County General Plan Land Use Element
- Placer County Planning Department website
- Martis Valley Community Plan, Martis Valley, Placer County, California (May 2003)
- Martis Valley Community Plan EIR, September 2003, Land Use Area Map
- Truckee 2025 General Plan, Land Use Element, Community Element, 2006
- Truckee Land Use Maps
- Squaw Valley General Plan and Land Use Ordinance, 1983

Cultural Resources

A desktop survey of the potential project area was conducted by ECO: LOGIC environmental specialists. The following cultural resource documents and sources were reviewed to assess possible cultural constraints along the water supply pipeline route:

- Placer County General Plan Cultural Resources Element
- Martis Valley Community Plan EIR, September 2003
- Truckee General Plan EIR, Cultural Resources Chapter, May 2006

5.2 POTENTIAL DEVELOPMENT CONSTRAINTS

This section addresses the potential biological, land use, and cultural resource -associated constraints that may exist along the potential route. Based on our literature review and knowledge of the area, fatal flaws or severe constraints to development that would render the project infeasible appear absent. However, given the past public involvement and interest in development projects in Martis Valley, public participation in the CEQA/NEPA process is expected to be involved. Environmental concerns are expected to revolve around water supply issues in Martis Valley and potential water level draw down impacts to Lahontan cutthroat trout, a federally *threatened* species. Permit streamlining strategies to ensure environmental compliance are presented in Sections 4 and 5.

5.2.1 BIOLOGICAL CONSTRAINTS

Potential constraints regarding environmental compliance and permitting are often related to biological resources and jurisdictional waters of the United States because crossing such resources triggers compliance with the Clean Water Act Sections 404 and 401, and the California and/or Federal Endangered Species Act. Potential biological resources (special status species) and jurisdictional waters within the alignments are discussed below.

Regulatory Framework

The following describes federal, state, and local environmental laws and policies that are relevant to the CEQA review process for both potential pipeline alignments.

Wetlands and Waters of the United States

Waters of the U.S. include a range of wet environments such as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, and wet meadows. The U.S. Army Corps of Engineers (Corps) regulates discharge of dredged or fill material into waters of the United States under Section 404 of the Clean Water Act (CWA). “Discharges of fill material” is defined as the addition of fill material into waters of the U.S., including, but not limited to the following: placement of fill that is necessary for the construction of any structure or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeway or road fills; and fill for intake and outfall pipes and subaqueous utility lines [33 C.F.R. §328.2(f)]. Section 401 of the CWA (33 U.S.C. 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into waters of the United States

to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

Federal Endangered Species Act

The United States Congress passed the federal Endangered Species Act (FESA) in 1973 to protect those species that are endangered or threatened with extinction. The FESA is intended to operate in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which federally endangered and threatened species depend.

The FESA prohibits the "take" of endangered or threatened wildlife species. "Take" is defined to include harassing, harming (including significantly modifying or degrading habitat), pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to engage in such conduct (16 USC 1532, 50 CFR 17.3). Actions that result in take can result in civil or criminal penalties.

The FESA and EPA Section 404 guidelines prohibit the issuance of wetland permits for projects that would jeopardize the existence of threatened or endangered wildlife or plant species. The U.S. Army Corps of Engineers must consult with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) when threatened or endangered species may be affected by a proposed project to determine whether issuance of a Section 404 permit would jeopardize the species. A "jeopardy determination" from the USFWS is considered a fatal flaw. In the context of the study site, the federal ESA would be triggered if development resulted in take of a threatened or endangered species (e.g., Lahontan cutthroat salmon) or if issuance of a Section 404 permit or other federal agency action could adversely affect or jeopardize a threatened or endangered species.

California Department of Fish and Game Code 1600 et. Seq.

The CDFG has jurisdiction under Section 1600 *et seq*. of the California Fish and Game Code over fish and wildlife resources of the state. Under Section 1603, a private party must notify the CDFG if a proposed project will "substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds except when the department has been notified pursuant to Section 1601." If an existing fish or wildlife resource may be substantially adversely affected by the activity, the CDFG may propose reasonable measures that will allow protection of those resources. If these measures are agreeable to the party, they may enter into an agreement with the CDFG identifying the approved activities and associated mitigation measures.

California Endangered Species Act

The State of California enacted the California Endangered Species Act (CESA) in 1984. The CESA is similar to the FESA but pertains to state-listed endangered and threatened species. It requires state agencies to consult with the California Department of Fish and Game (CDFG) when preparing California Environmental Quality Act (CEQA) documents to ensure that the state lead agency actions do not jeopardize the existence of listed species. It directs agencies to consult

with CDFG on projects or actions that could affect listed species, directs CDFG to determine whether jeopardy would occur, and allows CDFG to identify "reasonable and prudent alternatives" to the project consistent with conserving the species. Agencies can approve a project that affects a listed species if they determine that there are "overriding considerations"; however, the agencies are prohibited from approving projects that would result in the extinction of a listed species.

The state ESA prohibits the taking of state-listed endangered or threatened plant and wildlife species. CDFG exercises authority over mitigation projects involving state-listed species, including those resulting from CEQA mitigation requirements. CDFG may authorize taking if an approved habitat management plan or management agreement that avoids or compensates for possible jeopardy is implemented. CDFG requires preparation of mitigation plans in accordance with published guidelines.

Other Statues, Codes, and Policies Affording Species' Protection

CDFG Species of Special Concern

In addition to formal listing under FESA and CESA, plant and wildlife species receive additional consideration during the CEQA process. Species that may be considered for review are included on a list of "Species of Special Concern," developed by the CDFG. It tracks species in California whose numbers, reproductive success, or habitat may be threatened.

California Native Plant Society – Native Plant Species List

The California Native Plant Society (CNPS) maintains a list of plant species native to California that have low numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the *Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik, 1994). Potential impacts to populations of CNPS-listed plants receive consideration under CEQA review. The following identifies the definitions of the CNPS listings:

- List 1A: Plants believed extinct.
- List 1B: Plants rare, threatened, or endangered in California and elsewhere.
- List 2: Plants rare, threatened, or endangered in California, but more numerous elsewhere.
- List 3: Plants about which we need more information - a review list.
- List 4: Plants of limited distribution - a watch list.

Migratory Bird Regulations

Raptors (birds of prey) and migratory birds are protected by a number of state and federal laws. The federal Migratory Bird Treaty Act (MBTA) prohibits the killing, possessing, or trading of migratory birds except in accordance with regulations prescribed by the Secretary of Interior. Section 3503.5 of the California Fish and Game Code states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes or to take, possess, or destroy the

nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto."

General Plan and Local Community Plan Policies

Placer County

The following is a list of policies within the Natural Resources Section of the Placer County General Plan that provide protection to the biological and water resources within Placer County and depending on the need for a County discretionary action, may apply to both potential pipeline alignments.

Water Resources

- **Policy 6.A.1:** The County shall require the provisions of sensitive habitat buffers which shall, at a minimum, be measured as follows: 100 feet from the centerline of perennial streams, 50 feet from centerline of intermittent streams, and 50 feet from the edge of sensitive habitats to be protected including riparian zones, wetlands, old growth woodlands, and the habitat of rare, threatened or endangered. Based on more detailed information supplied as a part of the review for a specific project, the County may determine that such setbacks are not applicable in a particular instance or should be modified based on the new information provided. The County may, however, allow exceptions, such as in the following cases:

  a. Reasonable use of the property would otherwise be denied;

  b. The location is necessary to avoid or mitigate hazards to the public;

  c. The location is necessary for the repair of roads, bridges, trails, or similar infrastructure; or

  d. The location is necessary for the construction of new roads, bridges, trails, or similar infrastructure where the County determines there are no feasible alternatives and the project has minimized environmental impacts through project design and infrastructure placement.

Wetland and Riparian Areas

- **Policy 6.B.1:** The County shall support the "no net loss" policy for wetland areas regulated by the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the California Department of Fish and Game. Coordination with these agencies at all levels of project review shall continue to ensure that appropriate mitigation measures and the concerns of these agencies are adequately addressed.

- **Policy 6.B.2:** The County shall require new development to mitigate wetland loss in both regulated and non-regulated wetlands to achieve "no net loss" through any combination of the following, in descending order of desirability: (1) avoidance of riparian habitat; (2) where avoidance is not possible, minimization of impacts on the resource; or (3) compensation, including use of a mitigation banking program that provides the opportunity to mitigate impacts to rare, threatened, and endangered species and/or the habitat which supports these species in wetland and riparian areas.

Fish and Wildlife Habitat

- **Policy 6.C.1:** The County shall identify and protect significant ecological resource areas and other unique wildlife habitats critical to protecting and sustaining wildlife populations. Significant ecological resource areas include the following:
  - Wetland areas including vernal pools.
  - Stream environment zones.
  - Any habitat for rare, threatened or endangered animals or plants.
  - Critical deer winter ranges (winter and summer), migratory routes and fawning habitat.
  - Large areas of non-fragmented natural habitat, including Blue Oak Woodlands, Valley Foothill Riparian, vernal pool habitat.
  - Identifiable wildlife movement zones, including but not limited to, nonfragmented stream environment zones, avian and mammalian migratory routes, and known concentration areas of waterfowl within the Pacific Flyway.
  - Important spawning areas for anadramous fish.
- **Policy 6.C.6:** The County shall support preservation of the habitats of rare, threatened, endangered, and/or other special status species. Federal and state agencies, as well as other resource conservation organizations, shall be encouraged to acquire and manage endangered species' habitats.

Vegetation

- **Policy 6.D.4:** The County shall ensure that landmark trees and major groves of native trees are preserved and protected. In order to maintain these areas in perpetuity, protected areas shall also include younger vegetation with suitable space for growth and reproduction.

Placer County Tree Ordinance

- Placer County has a tree ordinance that mandates a permit be obtained for the removal or disturbance of any tree over six inches dbh (diameter at breast height) (PCGP, 1994). According to the Placer County Code Tree Ordinance (Section 12.16.050), a tree permit is not required for the removal of a protected tree under the following circumstances:
  - **D.** When compliance would interfere with activities of a public utility necessary to comply with applicable safety regulations and/or necessary to repair or avoid the interruption of services provided by such a utility. **Routine repair and maintenance of utilities would be exempt, new construction projects (i.e., the installation of high power, transmission line corridor) are subject to review.**

Nevada County General Plan

The following is a list of policies within the Resource Conservation and Development Section of the Nevada County General Plan. These policies provide protection to the biological and water

resources within Nevada County and if a County discretionary action were necessary for project approval, these policies would apply to both potential alignments.

Water

- **Policy 11.5:** Maintain the operation of the Nevada County Water Agency Advisory Council in order to promote continuing communication and cooperation between public water purveyors and other public agencies in protecting and enhancing the County's water resources.

Soils

- **Policy 12.1:** Enforce Grading Ordinance provisions for erosion control on all new development projects by adopting provisions for ongoing monitoring of project grading. Project site inspection shall be required prior to initial site disturbance and grading to ensure all necessary control measures, including proper staking and tree protection measures, are in place. The installation, maintenance, and performance of erosion and sedimentation control measures shall be monitored by County or District staff (or their designee) and completely funded by a project applicant. All County projects shall comply with this policy.
- **Policy 12.3:** Cooperate and encourage those activities dealing with techniques and practices to minimize erosion in cooperation with Nevada County Resource Conservation District, including provision of educational materials for the general public regarding techniques and practices to minimize erosion from construction activities.

Wildlife and Vegetation

- **Policy 13.8:** As part of the Comprehensive Site Development Standards, include measures applicable to all discretionary and ministerial projects to minimize disturbance of heritage and landmark trees and groves. These measures shall include, but are not limited to, requirements for on-site vegetation inventories and mandatory clustering of development in areas likely to support such vegetation or habitat.

Martis Valley Community Plan

The following policies were established in the 2003 Martis Valley Community Plan (MVCP) to give additional protection, above that offered in federal, state, and county regulations, to natural resources in the Martis Valley. Depending on the need for a County discretionary action, the MVCP policies would apply to both pipeline alignments.

Soils

- **Policy 9.C.2:** The County shall require topographic and slope analysis maps during the environmental review process or at the first available opportunity of project review to evaluate future grading activity, building location impacts, and road construction impacts.

Water Resources

- **Policy 9.D.1:** The County shall require the provision of sensitive habitat buffers which shall, at a minimum, be measured as follows: 100 feet from the centerline of perennial streams, 50 feet from centerline of intermittent streams, and 50 feet from the edge of

sensitive habitats to be protected including riparian zones, wetlands, old growth woodlands, and the habitat of rare, threatened or endangered species (see discussion of sensitive habitat buffers in Part 1 of the PCGP).

- In some cases, buffers shall be required which are substantially larger than noted above. Conversely, based on more detailed information supplied as a part of the review for a specific project, the County may determine that such setbacks are not applicable in a particular instance or should be modified based on the new information provided. In addition, the County may allow exceptions, such as in the following cases:

  a. Reasonable use of the property would otherwise be denied;

  b. The location is necessary to avoid or mitigate hazards to the public.

  c. The location is necessary for the repair of roads, bridges, trails or similar infrastructure; or

  d. The location is necessary for the construction of new roads, bridges, trails, or similar infrastructure where the County determines there is no feasible alternative and the project has minimized environmental impacts through project design and infrastructure placement.

- **Policy 9.D.2:** The County shall require that any permitted disturbance in the 100-year floodplain comply with the provisions of the Placer County Flood Damage Prevention Ordinance and any other existing regulations.

- **Policy 9.D.3:** The County shall require development projects proposing to encroach (where it has been determined to be appropriate) into a creek corridor or creek setback to do one or more of the following, in descending order of desirability:

  a. Avoid the disturbance of riparian vegetation;

  b. Replace riparian vegetation (on-site, in-kind);

  c. Restore another section of creek (in-kind) and/or;

  d. Pay a mitigation fee for restoration elsewhere (e.g. wetland mitigation banking program).

- **Policy 9.D.4:** The County shall require public and private development to address creeks and riparian corridors as follows:

  a. Preserve creek corridors and creek setback areas through easements or dedications. Parcel lines (in the case of a subdivision) or easements (in the case of a subdivision or other development) shall be located to optimize resource protection. If a creek is proposed to be included within an open space parcel or easement, allowed uses and maintenance responsibilities within that parcel or easement should be clearly defined and conditioned prior to map or project approval;

  b. Designate such easement or dedication areas (as described in a. above) as open space;

  c. Protect creek corridors and their habitat value by actions such as: 1) providing an adequate creek setback, 2) maintaining creek corridors in an essentially

natural state, 3) employing creek restoration techniques where restoration is needed to achieve a natural creek corridor, 4) utilizing riparian vegetation within creek corridors, and where possible, within creek setback areas, 5) prohibiting the planting of invasive, non-native plants within creek corridors or creek setbacks, and 6) avoiding tree removal within creek corridors;

d. Provide recreation and public access near creeks consistent with other General Plan policies;

e. Use design, construction, and maintenance techniques that ensure development near a creek will not cause or worsen natural hazards (such as erosion, sedimentation, flooding, or water pollution) and will include erosion and sediment control practices such as: 1)turbidity screens and other management practices, which shall be used as necessary to minimize siltation, sedimentation, and erosion, and shall be left in place until disturbed areas are stabilized with permanent vegetation that will prevent the transport of sediment off site; and/or 2) temporary vegetation is established sufficient to stabilize disturbed areas, and;

f. Provide for long-term creek corridor maintenance.

- **Policy 9.D.7:** The County shall prohibit grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of creeks and damage to riparian habitat.

- **Policy 9.D.10:** The County shall encourage the protection of flood plain lands and where appropriate, acquire public easements for purposes of flood protection, public safety, wildlife preservation, groundwater recharge, access and recreation.

Vegetation

- **Policy 9.E.3:** The County shall support the conservation of a healthy forest including outstanding areas of native vegetation, including, but not limited to, open meadows, riparian areas, Great Basin Sage Scrub, Mixed Coniferous Forest, Montane Chaparral, Montane Meadow, and Red Fir Forest.

- **Policy 9.E.4:** The County shall encourage the preservation of landmark trees and major groves of native trees which have special characteristics or serve an important function such as historical interest, visual screening, shading of creeks or slope stability. In order to maintain these areas in perpetuity, protected areas shall also include younger vegetation with suitable space for growth and reproduction.

- **Policy 9.E.5:** The County shall seek to preserve areas where rare, threatened, and endangered plant species have been identified as potentially occurring and that may be adversely affected by public or private development projects. 9.E.10. The County shall require that new development avoid ecologically-fragile areas (e.g., areas of rare or endangered species of plants, riparian areas). Where feasible, these areas and heritage trees should be protected through public acquisition of fee title or conservation easements to ensure protection.

Wetland and Riparian Areas

- **Policy 9.F.2:** The County shall require that natural open space buffers be maintained in non-riparian areas adjacent to drainage swales and creeks to reduce erosion and to aid

in the natural filtration of runoff waters flowing into these waterways. The buffers shall meet the standards contained in the PCGP unless a larger buffer is warranted based on site-specific fieldwork.

- **Policy 9.F.3:** The County shall support the "no net loss" policy for wetland areas regulated by the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the California Department of Fish and Game. Coordination with these agencies at all levels of project review shall continue to ensure that appropriate mitigation measures and the concerns of these agencies are adequately addressed.

- **Policy 9.F.4:** The County shall require new development to mitigate wetland and riparian loss in both federal jurisdictional and non-jurisdictional wetlands to achieve "no net loss" through any combination of the following, in descending order of desirability; (1) avoidance; (2) where avoidance is not possible, minimization of impacts on the resource; or (3) compensation, including use of a mitigation and conservation banking program that provides the opportunity to mitigate impacts to special status, threatened, and endangered species and/or the habitat which supports these species in wetland and riparian areas. Non-jurisdictional wetlands may include riparian areas that are not federal "waters of the United States" as defined by the Clean Water Act.

Fish and Wildlife Habitat

- **Policy 9.G.1:** The County shall identify and protect significant ecological resource areas and other unique wildlife habitats critical to protecting and sustaining wildlife populations. Significant ecological resource areas include the following:

  a. Wetland areas

  b. Stream corridors and associated riparian areas

  c. Identified habitat of special status threatened or endangered animals

  d. Critical deer winter ranges, migratory routes and fawning habitat

  e. Large areas of non-fragmented natural habitat, including all habitat types in the Martis Valley Plan area.

  f. Identifiable wildlife movement zones, including but not limited to, non-fragmented stream environment zones, avian and mammalian migratory routes, and known concentration areas of waterfowl within the Pacific Flyway.

  g. Martis Lake, Martis Creek and its tributaries.

- **Policy 9.G.10:** Prior to approval of discretionary development permits involving parcels within a significant ecological resource area, the County shall require, as part of the environmental review process, a biotic resources evaluation of the sites, prepared by a wildlife biologist or other qualified professional. The evaluation shall be based upon field reconnaissance performed at the appropriate time of year, (if necessary) to determine the presence or absence of special status, threatened, or endangered species of plants or animals. Such evaluation will consider the potential for significant impact on these resources, and will identify feasible measures to mitigate such impacts.

Air Quality

- **Policy 9.H.6:** The County shall require project-level environmental review to include identification of potential air quality impacts and designation of design and other appropriate mitigation measures or offset fees to reduce impacts. The County shall dedicate staff to work with project proponents and other agencies in identifying, ensuring the implementation of, and monitoring the success of mitigation measures.

- **Policy 9.H.7:** The County shall work with the Placer County Air Pollution Control District (PCAPCD) to reduce particulate emissions from construction, grading, excavation, and demolition to the maximum extent feasible. The County should include PM_{10} control measures as conditions of approval of subdivision maps, site plans, and grading permits. The County should inform developers of the requirements of the District's PM_{10} mitigation requirements when they apply for a grading permit.

Squaw Valley General Plan

The following policies were established in the 1984 Squaw Valley General Plan (SVGP) to give additional protection, above that offered in federal, state, and county regulations, to natural resources in the Squaw Valley. The SVGP will apply to both pipeline alignments.

Drainage/Water Quality

- **115.10:** A development's internal drainage system shall be so designed that the carrying and retention capacities of all downstream systems are preserved, or that the rate, flow, location, and size of that natural drainage systems downstream are unaffected. Any necessary downstream improvements are the responsibility of the applicant.

- **115.12:** Acquisition of any and all permits required by State and Federal authorities for work to be done within and/or around an established waterway or drainage system is the sole responsibility of the applicant.

- **115.14:** All internal drainage systems shall be designed so as not to increase turbidity, sediment yield, or the discharge of any harmful substances which will degrade the quality of water.

- **115.18:** The stream environment zone, here defined as the 100-year flood plain of any year-round watercourse, shall not be affected by development activities except as permitted by section 115.20 and 115.22 and 115.23 below.

- **115.20:** Where the stream environment zone has previously been modified by channelization, fill, or other human activity, such areas shall be restored by means of landscaping, revegetation, or similar stabilization techniques as a part of development activities on adjoining properties.

- **115.22:** Any crossings of a natural streambed by road, trail or other transportation facility shall be accomplished so that the natural stream characteristics are not impaired. Such crossings shall be considered development activities with respect to Section 115.20 above.

- **115.23:** Where development is proposed with in a stream environment zone that has previously been disturbed, as described in 115.20, above, it may be approved only if the decision-making body finds that it will:

  a. Not increase the obstruction on flood waters

  b. to increase the potential for flood damage to other properties either up or down stream

  c. Result in an overall improvement in water quality protection

  d. An overall improvement to the stream environment zone

Erosion Control

- **118.10:** All developments shall be planned, designed, constructed and maintained so that existing healthy trees and native vegetation on the site are preserved to the maximum extent feasible and are protected by adequate means during construction.
- **118.12:** A sedimentation and erosion control plan is required when grading is proposed which disturbs:

  a. An area greater than 1,000sq. ft.;

  b. Slopes steeper than 25%; or

  c. A stream environment zone.

- **118.14:** Sedimentation and erosion control plans address both construction related and long-term erosion control measures and shall be submitted for review and approval to the Department of Public Works. These plans may be a part of grading; drainage, or improvement plans.
- **118.16:** The control of sedimentation and erosion may include any combination of mechanical or vegetative measures approved by the county, including but not limited to those indentified in "Erosion and Sediment Control Guidelines for Developing Areas of the Sierra Foothills and Mountains" prepared by the High Sierra RC&D Council, November, 1981.
- **118.18:** All surfaces disturbed by vegetation removal, grading, haul roads, or other construction activity that alters the natural vegetative cover, are to be revegetated to control erosion, unless covered with impervious surfaces authorized by approved plans. Such revegetation work must be complete prior to October 15th of each year.

Town of Truckee 2025 General Plan

- The following is a list of policies within the Conservation and Open Space Section of the Town of Truckee 2025 General Plan that provides protection to the biological resources within town limits and that would apply to the potential National Forest Service Road 06 and the Highway 89 pipeline alignments.

Biological Resources

- **Policy 4.1:** Provide for the integrity and continuity of biological resources open space, habitat and wildlife movement corridors and support the permanent protection and restoration of these areas, particularly those identified as sensitive resources.

Wildlife

- **Policy 5.1:** Require biological resource assessments for all development in areas where special status species may be present.
- **Policy 5.3:** Protect to the extent possible federal or State-designated endangered, threatened, special status or candidate species.

Water Quality

- **Policy 11.1** Minimize excessive paving that negatively impacts surface water runoff and groundwater recharge rates.

Air Quality

- **Policy 13.3:** Require all construction projects to implement dust control measures to reduce particulate matter emissions due to disturbance of exposed top-soils. Such measures would include watering of active areas where disturbance occurs, covering haul loads, maintaining clean access roads, and cleaning the wheels of construction vehicles accessing disturbed areas of the site.

Project Setting

National Forest Service Road 06 Alignment

The physical topography of the potential NFS alignment is best described as Montane Forest. In addition to developed and residential areas, the pipeline route consists of four main habitats:

1. **Mixed Coniferous** with eastside pine (south end of Schaffer Mill Road and a small section along NFS 06) and mixed conifer (majority of NFS 06)
2. **Montane Meadow** consisting of mixed meadow plants (small undercrossing of Schaffer Mill Rd and small section along NFS 06)
3. **Great Basin Sage** with basin sagebrush (Schaffer Mill Rd) and bitterbrush plants (Airport)
4. **Red Fir Forest** consisting of red fir trees (southern section of NFS 06 across Highway 89 from Squaw Valley)

The pipeline would begin by the Truckee Airport in bitterbrush habitat. Then follow Schaffer Mill Road south where surrounding habitat changes from mixed meadow to basin sagebrush to eastside pine. The majority of the pipeline alignment would extend through mixed conifer forest as it follows the NFS 06 road, passing patches of eastside pine, mixed meadow, and red fir.

Highway 89 Pipeline Alignment Habitat

The Highway 89 Pipeline Alignment has similar topography to the NFS 06 Road Alignment, however distribution and occurrence of habitat types varies. The physical topography of the potential Highway 89 alignment is best described as montane forest. In addition to rural residential areas, the alignment consists of five main habitats:

1. **Red Fir Forest** consisting of red fir trees (majority of Highway 89)
2. **Montane Meadow** consisting of mixed meadow plants (along Truckee River)
3. **Great Basin Sage** with basin sagebrush (Airport) and bitterbrush (Airport)
4. **Mixed Coniferous** with eastside pine (Highway 89) and mixed conifer (Highway 89)
5. **Riparian Scrub** containing willow and quaking aspen (along Truckee River)

The alignment will begin by the Truckee Airport in bitterbrush habitat where it would connect to existing TDPUD infrastructure. Along the 89 Corridor surrounding habitat is mostly red fir forest, riparian scrub, and montane meadow. The Truckee River parallels the highway providing a moist climate to support riparian scrubs and meadows. The alignment would be designed to stay in the west shoulder of the highway to minimize impacts to river habitats. There are several wetland habitats along the west shoulder of the highway due to drainage culverts or ground seeps.

Table 5-1 shows each of the five main habitats the associated plant and animal species and geographic distribution.

Pipeline Alignment Analysis

National Forest Service Road 06 Alignment & Highway 89 Pipeline Alignment

Due to the close proximity of the two potential pipeline alignments, a majority of the flora and fauna for the two alignments overlap. Both pipeline alignments transverse mixed coniferous and red fir forests. Mixed coniferous and red fir forests provide cover, foraging, and breeding habitat for large diversities of resident and migratory wildlife, including listed and special status species.

Listed and Special-Status Species

Special-status species are plant and animal species that have been afforded special recognition by federal, state, or local resource agencies or organizations. Listed and special-status species are of relatively limited distribution and may require specialized habitat conditions. Listed and special-status species are defined as:

Special-Status species are defined as plants and animals that are: Legally protected under the California and Federal Endangered Species Acts or under other regulations; considered sufficiently rare by the scientific community to qualify for such listing; or considered sensitive because they are unique, declining regionally or locally, or at the extent of their natural range.

Table 5-1
Biological Communities Found within the Potential Pipeline Alignments

Biological Communities	Location	Vegetation Type	Common Wildlife	Common Vegetation
Mixed Coniferous Forest	**NFS 06 Road:** south Schaffer Mill Road and NFS Road **HWY 89:** intermittent along Hwy 89	1. Eastside pine 2. Lodgepole pine 3. Mixed conifer 4. Subalpine conifer 5. White fir	**Avian species:** western tanager (*Piranga ludoviciana*), western wood peewee (*Contopus sordidulus*), hairy woodpecker (*Picoides villosus*), mountain chickadee (*Poecile gambeli*), white-breasted nuthatch (*Sitta carolinensis*), brown-headed cowbird (*Molothrus ater*), chipping sparrow (*Spizella passerina*), Oregon junco (*Junco hyemalis thurberi*), yellow-rumped warbler *Dendroica coronata*), northern flicker (*Colaptes auratus*), and Steller's jay (*Cyanocitta telleri*). **Mammalian species:** lodgepole chipmunk (*Tamias speciosus*), mule deer (*Odocoileus hemionus*), montane vole (*Microtus montanus*), fisher (*Martes pennanti*), California vole (*Microtus californicus*), black bear (*Ursus americanus*), raccoon (*Procyon lotor*), mountain lion (*Felis concolor*), and western gray squirrel (*Sciurus griseus*).	**Tree species:** Jeffrey pine (*Pinus jeffreyi*), white fir (*Abies concolor*), sugar pine (*Pinus lambertiana*), ponderosa pine (*Pinus ponderosa*), lodgepole pine (*Pinus contorta* ssp. *murrayana*), and western white pine (*Pinus monticola*). **Plant species:** Indian paintbrush (*Castilleja pinetorum*), snowberry (*Symphoricarpos mollis*), mule ears (*Wyethia mollis*), Sierra currant (*Ribes nevadense*), and mountain pride (*Penstemon newberryi*)
Red Fir Forest	**NFS 06 Road:** south end of NFS 06 Road and Squaw Valley **HWY 89:** majority of Hwy 89	Red fir trees	(See above discussion, species similar to mixed coniferous forest species).	These habitats within the project areas are characterized by **dense stands of red fir** (*Abies magnifica*). Because the canopy associated with this habitat is extremely dense and relatively impermeable to sunlight, the understory supports sparse vegetation.
Montane Meadow	**NFS 06 Road:** Schaffer Mill Road NFS Road and Truckee River **HWY 89:** Truckee River	1. Annual grass/forbs 2. Wet meadow 3. Perennial grass 4. Mixed meadow	**Species include:** American robin, mountain chickadee, cliff swallow (*Petrochelidon pyrrhonota*), killdeer (*Charadrius vociferus*), mourning dove, northern flicker, California mule deer, western bluebird (*Sialia mexicana*), and green-tailed towhee (*Pipilo chlorurus*)	**Shrubs:** various willows (*Salix* spp.), **Grass and forbs Species:** meadow barley (*Hordeum brachyantherum*), common monkeyflower (*Mimulus guttatus*), clover (*Trifolium* spp.), Indian paintbrush, mint (*Mentha* sp.), shooting star (*Dodecatheon jeffreyi*), and yarrow (*Achillea millefolium*) **Herbaceous species:** fireweed (*Epilobium angustifolium*.), cinquefoil (*Potentilla* sp.), and primrose (*Primula* sp.).

Table 5-1
Biological Communities Found within the Potential Pipeline Alignments

Biological Communities	Location	Vegetation Type	Common Wildlife	Common Vegetation
Great Basin Sage	**NFS 06 Road:** Schaffer Mill Road and Truckee Airport **HWY 89:** Truckee Airport	1. Bitterbrush 2. Basin sagebrush 3. Western juniper	**Avian species:** violet green swallow (*Tachycineta thalassina*), turkey vulture (*Cathartes aura*), American robin (*Turdus migratorius*), mountain chickadee, mourning dove (*Zenaida* macroura), northern flicker, chipping sparrow, vesper sparrow (*Pooecetes gramineus*), and Oregon junco. **Mammalian species:** mule deer	**Plant Species:** sagebrush (*Artemisia tridentata*), rabbitbrush (*Chrysothamnus nauseosus*), western juniper (*Juniperus occidentalis* var. *occidentalis*), squirrel tail (*Sitanion hystrix*), and bitterbrush (*Purshia tridentata*) **Tree Species**: Jeffery pine and ponderosa pine
Riparian Scrub	**NFS 06 Road:** Truckee River crossing **HWY 89:** Along the Truckee River	1. Willow 2. Quaking aspen 3. Willow-aspen.	**Species include:** raccoon, western gray squirrel, California mule deer, northern flicker, mountain chickadee, and lodgepole chipmunk.	**Species include:** willow (*Salix* sp.), alder (*Alnus tenuifolia*), cottonwood (*Populus* sp.), and quaking aspen (*Populus tremuloides*)

Figure 5-3 identifies the species listed in the CNDDB for the Truckee, Martis Peak, Tahoe City, and Kings Beach 7.5-minute USGS quadrangles. The species identified in the list are known to occur within 3 miles of both potential pipeline alignments.

Discussed in **Table 5-2** and in further detail in Appendix A are the special-status wildlife species that have the potential to occur within either possible pipeline alignment. The CNDDB lists 13 special-status wildlife species and 8 special status botanical species as occurring within a three-mile radius of the potential alignments.

These species are protected by state and/or federal resource agencies and are discussed in **Table 5-2**. Additionally, the long-legged myotis (*Myotis volans*), a federal species of concern, is known to occur in the vicinity of the potential project areas and is discussed in **Table 5-2**.

For each of these species the "potential for occurrence" along both alignments was evaluated as follows:

- **Unlikely:** The pipeline alignment and/or immediate area do not support suitable habitat for a particular species. Project is outside the species known range.
- **Low Potential:** The alignment and/or immediate area only provide limited habitat for a particular species. In addition, the known range for a particular species may be outside the immediate project area.
- **Medium Potential:** The alignment and/or immediate area provide suitable habitat for a particular species, and habitat for the species may be impacted.
- **High Potential:** The alignment and/or immediate area provide ideal habitat conditions for a particular species and/or known populations occur in the immediate area and within the potential area of impact.

A description of the special-status plants and wildlife species identified during the pre-survey screening as known to occur or having a potential to occur within the project region is provided below.

Wildlife

Potential habitat for all 13 wildlife species, Lahontan cutthroat trout (*Oncorhynchus clarki*), mountain yellow-legged frog (*Rana muscosa*), northern goshawk (*Accipiter gentillis*), yellow warbler (*Dendroica petechia brewsteri*), California wolverine (*Gulo gulo luteus*), Sierra Nevada red fox (*Vulpes vulpes necator*), Sierra Nevada mountain beaver (*Aplodontia rufa californica*), California spotted owl (*Strix occidentalis occidentalis*), osprey (*Pandion haliaetus*), Sierra Nevada snowshoe hare (*Lepus americanus tahoensis*), and western white-tailed jackrabbit (*Lepus townsendii*) exists near both alignments. Willow flycatcher (*Empidonax trailli brewsteri*) is known from the Lake Tahoe basin and is listed in the USFWS species list for this region. Two additional special-status species recorded in the USFWS species lists for the Truckee, Martis Peak, Tahoe City, and Kings Beach quadrangles are unlikely to occur within the vicinity of either potential pipeline alignment and include the Sierra pine marten (*Martes americana*) and the Lake Tahoe benthic stonefly (*Capnia lacustra*).

Table 5-2
Special-Status Species That Are Known to Occur or Have Potential in the Region around the Project Site (CNDDB/CNPS, 2008)

Common Name Scientific Name	Legal Status[a]			Geographic Distribution/Floristic Province (project site elevation ~2000 meters)	Preferred Habitat	Known Occurrences	Level of Potential for Occurrence
	Federal	State	CNPS				
Plants							
Rorippa subumbellata Tahoe yellow-cress	FSC	CE	1B	Known only from the Lake Tahoe shoreline	Shorelines supporting decomposed granitic soils	Lake Tahoe	**Unlikely**, only known on the sandy shores of Lake Tahoe.
Eriogonum umbellatum var. torreyanum Donner Pass buckwheat	FSC		1B	1840-2620 meters, steep slopes and ridge tops	Volcanic soils in rocky meadows and upper montane coniferous forests	Historically known to occur near the intersection of Highway 89 and Squaw Valley Road. Also, in the upper reaches of Squaw Creek	**Medium**, according to CNDDB (2008), the population located near the alignment "was probably destroyed by widening Hwy 89. The west side of Hwy 89 was searched by Kan in 1991 and no plants were observed." Therefore the population mapped and registered in the CNDDB at the project site is presumed extant.
Ivesia sericoleuca Plumas ivesia	FSC		1B	1400-2000 Meters, Martis Valley	Occurs in vernally mesic conditions within Great Basin sage scrub, lower coniferous forest, meadow, seep, and vernal pool habitats	Truckee Airport, Martis Valley along Hwy 267.	**Medium**, suitable habitat and known occurrence near both alignments. Habitat may exist along NFS 06 Road.
Arabis rigidissima* var. *demota Carson Range rock cress	FSC		1B		Broadleaved upland forest and upper montane coniferous forest within rocky well drained soil conditions		**Low**, not within 3 miles of either alignment. Potential for habitat along NFS 06 Road.
Scutellaria galericulata Marsh skullcap			2.2	0-2100 Meters	Marshes and swamps throughout lower montane coniferous forest, meadows, and seeps	Near Truckee	**Medium,** habitat around the Truckee River and its tributaries is suitable. Possible impacts could occur from both species.

Table 5-2
Special-Status Species That Are Known to Occur or Have Potential in the Region around the Project Site (CNDDB/CNPS, 2008)

Common Name Scientific Name	Legal Status[a]			Geographic Distribution/Floristic Province (project site elevation ~2000 meters)	Preferred Habitat	Known Occurrences	Level of Potential for Occurrence
	Federal	State	CNPS				
Ergeron nevadaincola Nevada Daisy			2.3	1400-2900 Meters	Great basin scrub, found in lower montane coniferous forest and pinyon-juniper woodland	Deer Park above the summit of "The Craggs"	**Low,** potential habitat exists along both alignments; however, there are no known occurrences near the alignments.
Glyceria grandis American manna grass			2	15-1980 Meters	Wet meadows, ditches, streams, and ponds	Truckee River near Squaw Creek	**Medium**, potential habitat and known to occur near both alignments.
Sphaeralcea munroana Munroe's desert mallow			2	2000 Meters	Dry, open habitats	On the slopes above Squaw Creek	**Low,** unsuitable habitat near Squaw Creek, no population occurrence along the rest of the alignment.
Invertebrates							
Capnia lacustra Lake Tahoe benthic stonefly	FSC			Endemic to Lake Tahoe; found at depths of 95-400 feet	Open water	Lake Tahoe	**Unlikely,** Endemic to Lake Tahoe.
Fish							
Oncorhynchus clarki henshawi Lahontan cutthroat trout	FT			In eastern California	Freshwater lakes and streams	Pole Creek (CNDDB, presence reconfirmed 1993).	**Low**, the prevalence of Rainbow and Brown Trout in the Truckee River has rendered Lahontan cutthroat basically absent from the River. **High,** Lahontan cutthroat trout is known to occur in Martis Creek.
Amphibians							
Rana muscosa Mountain yellow-legged frog	FSC	CSC	FSS	In elevations ranging from 1,200 to 7,500 feet	Lakes, streams, and ponds	Historically found along Squaw Creek and in Squaw Meadow.	**Low,** last registered area sighting was in the 1960's. Populations are not known to occur within the area of either alignment.

Table 5-2
Special-Status Species That Are Known to Occur or Have Potential in the Region around the Project Site (CNDDB/CNPS, 2008)

Common Name Scientific Name	Legal Status[a]			Geographic Distribution/Floristic Province (project site elevation ~2000 meters)	Preferred Habitat	Known Occurrences	Level of Potential for Occurrence
	Federal	State	CNPS				
Birds							
Accipiter gentillis Northern goshawk	FSC (MNBMC)	CSC	FSS	Middle to high elevation	Mixed coniferous forest habitats. Uses old nests and maintains alternate nest sites on north slopes near water.	Sawtooth Ridge	**Medium,** potential habitat exists along both alignments.
Strix occidentalis occidentalis California spotted owl	FSC (MNBMC)	CSC	FSS	0-2300 Meters, 40-240ha of forest, permanent water, and suitable nesting trees and snags.	Old growth forests with multiple layered canopies; associated with mixed coniferous, redwood, and Douglas fir forest habitats. Narrow steep sided canyons with north-facing slopes.		**Medium,** potential habitat exists along both alignments.
Haliaeetus leucocephalus Bald eagle	DE	CE		Nests in the northernmost counties of California	Within dense conifer stands and woodlands		**Medium,** potential habitat exists along both alignments.
Dendroica petechia brewsteri Yellow warbler		CSC		Up to 8,000 feet (in Sierra Nevada)	Open canopy coniferous forests	South of Mt. Watson and East end of Donner Lake	**Medium,** potential habitat exists along both alignments
Empidonax traillii brewsteri Willow flycatcher		CE		In the Sierra from May to September in elevations from 2000-8000 feet	Open wet meadows and riparian habitat; nests in dense willow thickets		**Medium,** potential habitat exists along the Truckee and Deer Creek
Osprey		CSC	FSS	California	Commonly nests within the forested habitats adjacent or near to rivers or large water bodies	Donner Lake	**Medium,** potential habitat exists along the Truckee River

Table 5-2
Special-Status Species That Are Known to Occur or Have Potential in the Region around the Project Site (CNDDB/CNPS, 2008)

Common Name Scientific Name	Legal Status[a]			Geographic Distribution/Floristic Province (project site elevation ~2000 meters)	Preferred Habitat	Known Occurrences	Level of Potential for Occurrence
	Federal	State	CNPS				
Mammals							
Lepus americanus tahoensis Sierra Nevada snowshoe hare	FSC	CSC		Found only in the Sierra Nevada	In young growth mixed conifer, subalpine conifer, red fir, Jeffrey pine, lodgepole pine, and aspen forests. In dense understory along the edge of forests close to meadows.		**Low,** potential habitat exists along both alignments; however, since both alignments follow existing roads, habitat is limited.
Myotis volans Long-legged myotis bat	FSC			Generally over 4,000 feet	Occurs in woodlands and forest habitats; roosts in rock crevices, under bark, in tree snags, and cliffs		**Medium,** potential habitat exists along both alignments.
Gulo gulo luteus California wolverine	FSC	CT	FSS	4300-7300 feet, known to travel up to 100 miles	Mixed conifer, red fir, and lodgepole forests. Needs a water source and logs to burrow for cover and den sites.	Sagehen (2008) and Squaw Valley (1953)	**Medium,** potential habitat exists along both alignments; however, disturbance from human activity along both routes makes the alignments less than optimal for this species.
Aplodontia rufa californica Sierra Nevada mountain beaver	FSC	CSC		Within the Sierra Nevada mountain range	Dense growths of small deciduous trees and shrubs, wet soil, and abundance of forbs. Needs dense understory for food and cover, burrows in soft soil and needs an abundant supply of water.	Cabin Creek and Pole Creek, tributaries to the Truckee River.	**Medium**, potential habitat is present along the Highway 89 alignment since it will cross multiple tributaries of the Truckee River.
Martes americana Sierra pine marten			FSS	Along the north coast and within the Sierra Nevada, Klamath, and Cascades mountain ranges	Various habitats		**Low,** known range for the species is outside of both alignment corridors.

Table 5-2
Special-Status Species That Are Known to Occur or Have Potential in the Region around the Project Site (CNDDB/CNPS, 2008)

Common Name Scientific Name	Legal Status[a]			Geographic Distribution/Floristic Province (project site elevation ~2000 meters)	Preferred Habitat	Known Occurrences	Level of Potential for Occurrence
	Federal	State	CNPS				
Lepus townsendii Western white-tailed jackrabbit		CSC		Sagebrush, subalpine conifer, juniper, alpine dwarf shrub, and perennial grasslands.	Open areas with scattered shrubs and exposed flat-topped hills with open stands of trees, brush, and herbaceous understory	Near Tahoe City (1920)	**Low,** known range is outside of both alignment corridors.
Vulpes vulpes necator Sierra Nevada red fox		CT	FSS	Above 7000 feet but has been seen as low as 3900.	Various habitats, including lodgepole pine, mixed conifer, montane riparian, and ponderosa pine. Requires dense vegetation for cover and prefers habitats adjacent to meadows for hunting. Dens are located in rock outcrops and hollow logs and are known to burrow in friable soils.		**Medium**, potential habitat is present along both alignments.

Raptors and other migratory birds are also protected by state and/or federal resource agencies. Numerous raptor species, including red-tailed hawk (*Buteo jamaicensis*), Northern goshawk, Coopers hawk (*Accipiter cooperii*), and sharp-shinned hawk (*Accipiter striatus*), forage and nest in the Sierra Nevada. Raptor nests are protected under the Migratory Bird Treaty Act (MBTA) and Section 3503.5 of the California Fish and Game Code. The montane riparian, red fir, and mixed coniferous forest habitats across either potential pipeline alignment support potential nesting habitat for numerous raptor species. Sharp-shinned hawk and Cooper's hawks were observed on the Siller Ranch site in 1999 and 2000 (Jones & Stokes, 2001). Consequently, raptor species likely forage and nest within either potential pipeline alignment area.

Other Migratory birds forage and nest in multiple habitats such as oak woodlands, grasslands, riparian woodlands, and coniferous forests. The nests of all migratory birds are protected under the MBTA, which makes it illegal to destroy any active migratory bird nest. Numerous migratory bird species have the potential to nest within either potential pipeline alignment.

Potential impacts or lack thereof to all species listed above will need to be addressed in detail. However, given their listing status and high profile it is expected that the Lahontan cutthroat trout and Northern goshawk will require extensive documentation and study.

Plants

According to the Martis Valley Community Plan EIR and preliminary site evaluation by an ECO:LOGIC biologist, mixed coniferous forest is the dominant habitat found within both the NFS 06 Road Pipeline Alignment and the Highway 89 Pipeline Alignment. As shown in **Table 5-1** there are five biological community types along the potential alignments.

A California Natural Diversity Database (CNDDB) search of the Tahoe City, Truckee, Kings Beach, and Martis Peak USGS 7.5 minute quadrangles lists thirteen known special status plant species. Eight of these plant species are known to occur within three miles of the project location (**Figure 5-3**). Two other special status species found in the four-quadrangle search were the Carson Range rock cress (*Arabis rigidissima var. demote*) and Oregon fireweed (*Epilobium oreganum*); however, there is no suitable habitat for the species within either pipeline alignment. **Table 5-2** and Appendix A provide an analysis of potential impacts (from each alignment) on the listed/special status species.

Placer County Tree Ordinance

The potential water supply pipeline alignments are surrounded by red fir forest, mixed coniferous forest, and riparian scrub. Construction of the potential pipeline may require the removal of certain trees for site development. According to Placer County tree ordinance, a permit be obtained for the removal or disturbance of any tree over six inches dbh (diameter at breast height) (PCGP, 1994). Since SVPSD is a public utility, they may be exempt from the county ordinance (Placer County Code Tree Ordinance, Section 12.16.050)

The goal is to minimize tree loss by following existing the NFS 06 Road and Highway 89 indicating that tree loss is not expected to be substantial. Therefore, mitigation for loss of coniferous trees either by on-site plantings or payment of in-lieu fees to Placer County may be required for tree removal.

Summary of Special Status Species

At a minimum, surveys for nesting raptors (i.e. northern goshawks) and migratory birds, special-status botanical species, Lahontan cutthroat trout, and mountain yellow-legged frog habitat will need to be conducted along the route. Potential direct (project construction) and indirect (growth inducing and water drawdown) impacts to the species and habitat will need to be addressed in the CEQA/NEPA document and through Section 7 consultations.

Although compliance with FESA and CESA will be necessary and Section 7 FESA consultations/permitting can be time consuming and costly, there do not appear to be any fatal flaws (i.e. species impacts that could result in a USFWS "jeopardy finding" that precludes project implementation). Therefore, based on our knowledge of the area and a literature review, there appear to be no fatal flaws with respect to special-status wildlife species habitat within either of the potential pipeline alignments.

To expedite the environmental permitting process, where feasible the pipeline should be designed to avoid special status species' habitat such as goshawk and spotted owl nesting areas and wetlands or stream banks that could support mountain yellow-legged frogs.

General Plan Biological Resource Policy Compliance

Both alignments cross multiple local jurisdictions. Each local agency, as a responsible agency under CEQA and will review the project EIR for compliance with their local general plan policies and provide comments. In addition, if a local agency takes a discretionary action, such as the issuance of a grading or encroachment permit, that agency must ensure the project complies with general/community plan policies.

Compliance with most of the general and community plan policies listed in Section 3.1.1 will occur through the state and federal permitting process and the implementation of BMPs. However, it should be noted that the County considers Martis Creek and its tributaries significant ecological resources and if a County action is required for the project, the County is required to protect such significant ecological resources (Policy 9.G.1). Therefore, studies regarding potential water- level draw down on Martis Creek will likely be required.

Wetlands and Waters of the U.S.

The potential pipeline project passes near several-mapped National Wetlands Inventory identified wetlands and other waters of the US, and will need to cross the Truckee River, a water of the US (National Wetlands Inventory, 2008). The National Wetland Inventory wetland locations are based on aerial surveys; therefore, in some cases wetlands may be mapped that are not considered Jurisdictional by the US Army Corps of Engineers under the CWA Section 404. This

is because they would not meet the "three-prong" soils/hydrology/vegetation criteria. In addition, the National Wetland Inventory mapping is not a field survey-based map; some site-specific jurisdictional wetlands may be absent from this database. As such, official wetland delineation along the potential alignments will be required to assess the exact extent of wetlands in the area.

National Forest Service 06 Road Pipeline Alignment

The northern and southern sections of the NFS 06 Road Alignment only pass through mapped wetlands at the Truckee River; however, there are also wetlands near other portions of the alignment. These mapped jurisdictional waters include palustrine temporarily flooded emergent wetland (PEMA), palustrine seasonally flooded scrub-shrub wetland (PSSC), and riverine permanently flooded unconsolidated bottom (R3UBH).

The potential NFS 06 Road Pipeline Alignment follows existing roads for the majority of the pipeline. Based on a review of the National Wetlands Inventory, there are palustrine temporarily flooded wetlands near the airport at the northern section of the pipeline; however, the potential project does not intersect them. Freshwater-forested shrub wetlands exist immediately south of the pipeline route as it parallels Deer Creek. The pipeline will cross Deer Creek, which is a tributary to the Truckee River. Since Deer Creek has a defined bed and bank and is a tributary to the Truckee, it would likely be considered a Water of the US. Drilling the south end of the potential pipeline under the Truckee River, a perennial riverine Water of the US, will avoid Corps jurisdiction in this area; however, either a Nationwide 12 (utilities lines) or more likely an individual permit will be required for the project.

Highway 89 Pipeline Alignment

The Highway 89 Pipeline Alignment follows the Truckee River from the Town of Truckee all the way to the entrance of the Painted Rock subdivision near the entrance to Squaw Valley. Mapped jurisdictional waters along the River include palustrine temporarily/seasonally flooded emergent wetland (PEMA/C), palustrine seasonally/temporarily flooded scrub-shrub wetland (PSSC/A), palustrine temporarily flooded forested wetland (PFOA), palustrine permanently flooded unconsolidated bottom (PUBH), and riverine permanently/temporarily flooded unconsolidated bottom (R3UBH/A).

The potential alignment follows the existing Highway 89 shoulder. Based on a review of the National Wetlands Inventory, there are palustrine temporarily flooded wetlands near the airport at the northern section of the alignment; however, the potential project does not intersect them and passes through existing TDPUD infrastructure until it reaches Highway 89. Along Highway 89 the alignment does not cross any mapped wetlands; however, it does cross several tributaries to the Truckee River and would be require a site assessment. All mapped wetlands are adjacent to the Truckee and not intersected by the project. A Nationwide 12 (utilities lines) or more likely an individual permit will most likely be required for the project, since it crosses multiple tributaries.

Summary of Wetlands and Waters of the U.S. Findings

Since the NFS 06 Road Alignment will cross Deer Creek, the Truckee River, and possibly unidentified wetlands and the Highway 89 Alignment will cross multiple tributaries to the Truckee River and possibly unidentified wetlands, a wetland delineation and CWA Section 404 permit will be required. Avoidance, mitigation, or compensatory measures will need to be employed to ensure the project is the least environmentally damaging option and to obtain permits as necessary from the Corps.

5.3 LAND USE CONSTRAINTS

Land Use constraints often are in the form of zoning issues, incompatible use issues relative to neighboring properties, and general planning issues related to growth moratoriums. The potential water supply pipeline would be consistent with surrounding forest, open space, and residential land uses.

The two potential pipeline alignments would be located in Placer and Nevada Counties. Several planning documents discuss land uses in the region. Literature reviewed for this land use constraints analysis is included in section 2.2 of this report.

5.3.1 REGULATORY FRAMEWORK

Federal

U. S. Forest Service

Divisions of the United States Forest Service that operate in the Truckee-Tahoe Region include the Tahoe National Forest, the El Dorado National Forest, and the Lake Tahoe Basin Management Unit. Although individual activities consistent with the National Forest Management Act of 1976 exist in each district, long-range comprehensive management plans were developed for the Sierra Nevada National Forests in 1998. This management plan, encompassing 10 Sierra Nevada U.S. Forest Service districts and the Lake Tahoe Basin Management Unit, is known as the Sierra Nevada Framework for Conservation and Collaboration. The plan incorporates the latest scientific information into national forest management through broad public and intergovernmental participation in natural resource planning (USFS, 2000). The U.S. Forest Service is responsible for managing its land holdings within the Plan area.

State

California Department of Forestry

The California Forest Practice Act was adopted in 1973, resulting in a comprehensive forest regulation process. The California Department of Forestry (CDF) oversees enforcement of California's forest practice regulations. Under the Forest Practice Act, Timber Harvesting Plans (THPs) are submitted to CDF for commercial timber harvesting on all non-federal timberlands. The plans are reviewed for compliance with the Forest Practice Act and rules adopted by the

State Board of Forestry and Fire Protection as well as other state and federal laws that protect watersheds and wildlife. CDF foresters also do on-site inspections of proposed logging sites. CDF has jurisdiction over all timber and forestlands, regardless of whether the land is zoned TPZ. Future development within the Plan area in timber areas would be required to obtain a Timberland Conversion Permit from CDF.

Local

Placer County General Plan and Zoning Code

General Land Use

- **Policy 1.A.1** The County will promote the efficient use of land and natural resources.

Public and Quasi-Public Facilities, Infrastructure

- **Policy 1.F.3** The County shall require public facilities, such as wells, pumps, tanks, and yards, to be located and designed so that noise, light, odors, and appearance do not adversely affect nearby land uses.

Open Space, Habitat, and Wildlife Resources

- **Policy 1.I.1** The County shall require that significant natural, open space, and cultural resources be identified in advance of development and incorporated into site-specific development project design. The Planned Residential Developments (PDs) and the Commercial Planned Development (CPD) provisions of the Zoning Ordinance can be used to allow flexibility for this integration with valuable site features.
- **Policy 1.I.2** The County shall require that development be planned and designed to avoid areas rich in wildlife or of a fragile ecological nature (e.g., areas of rare or endangered plant species, riparian areas). Alternatively, where avoidance is infeasible or where equal or greater ecological benefits can be obtained through off-site mitigation, the County shall allow project proponents to contribute to off-site mitigation efforts in lieu of on-site mitigation.

Martis Valley Community Plan

The Martis Valley Community Plan (MVCP) defines the various land use designations and sets the goals and policies to implement the plan. It incorporates policy from both the 1975 Martis Valley General Plan and the 1994 Placer County General Plan. The land use designations set forth in the land-use map for the MVCP are consistent with, and are designed to implement, the goals, policies, and programs set forth in the PCGP. The following project specific policies are set forth to examine potential land use and zoning changes required by either potential alignment.

General Land Use

- **Policy 1.A.1** The County will promote the efficient use of land and natural resources and will encourage "in-fill" development.

- **Policy 1.A.2** The County shall permit only low-intensity forms of development in areas with sensitive environmental resources or where natural or human-caused hazards are likely to pose a significant threat to health, safety, or property.
- **Policy 1.A.4** The County shall promote patterns of development that facilitate the efficient and timely provision of urban infrastructure and services.

Public and Quasi-Public Facilities, Infrastructure

- **Policy 1.D.3** The County shall require public facilities, such as wells, pumps, tanks, and storage yards, to be located and designed so that noise, light, odors, and appearance do not adversely affect nearby land uses.
- **Policy 1.D 4** The County shall require new public facilities, which serve localized needs such as schools, be located within or near Martis Valley.

Forestry Land Use

- **Policy 1.F.2** The County shall recognize and acknowledge the multi-use management strategy adopted by the United States Forest Service for the Martis Valley/Tahoe National Forest area.
- **Policy 1.F.3** The County shall discourage development that conflicts with timberland management.
- **Policy 1.F.4** The County shall review development plans for all lands adjoining USFS lands for compatibility with the long-term maintenance and use of the forestlands.

Open Space, Habitat, and Wildlife Resources

- **Policy 1.G.1** The County shall support the preservation and enhancement of natural landforms, native vegetation, and natural resources as open space. The County shall permanently protect, as open space, areas of natural resource value, including open meadows, mixed conifer forests, high montane meadows, riparian corridors, and floodplains. In this Plan, those areas affected by this policy have been included in the Open Space or Forest designations in the land use diagram.
- **Policy 1.G.2** The County shall require that significant natural, open space, and cultural resources be identified in advance of development and incorporated into site-specific development project design. The Planned Residential Development (PD) provisions of the Zoning Ordinance can be used to allow flexibility for this integration with valuable site features.
- **Policy 1.G.3** The County shall require that development be planned and designed to avoid areas rich in wildlife or of a fragile ecological nature (e.g., areas of rare or endangered plant species, riparian areas).

Squaw Valley General Plan

- The following policies were established in the 1984 Squaw Valley General Plan (SVGP) to give additional protection, above that offered in federal, state, and county regulations, to natural resources in the Squaw Valley. The SVGP will apply to both pipeline alignments.

Intensity Density

- 112.10 The maximum number of units in any given residential project shall be expressed in term s of the bedrooms (indicated by the Plan by the Density Factor [D.F.] expressed in bedrooms per acre). It has been by the County that the total number of bedrooms in a project is a more accurate determinant of potential impacts on public services and resources than are dwelling units due to the wide variation in size of a single dwelling unit. For the purpose of calculating the number of bedrooms in a project, rooms which potentially serve as bedrooms shall be counted as such (including dens, studies, libraries, lofts, etc.). (Family rooms, living rooms, kitchens, and dining rooms shall not be counted as bedrooms). A studio should be counted as a one-bedroom unit.

Public Services

- **145.10 Water** All developments must be served with adequate water in accordance with requirements of the Placer County Health Department. Fire flow requirements as determined by the Squaw Valley Fire Department and the Uniform Fore Code must be provided without reducing the level of service to existing development.

5.3.2 PIPELINE ALIGNMENT ANALYSIS

National Forest Service 06 Road Alignment

This pipeline alternative is located almost entirely on an existing unimproved Forest Service road in an unincorporated area of Placer County characterized by undeveloped forestland and open space. The remainder of the route is characterized by open forestland until the Highway 89 undercrossing at Squaw Valley. General land use designations and policies for the project vicinity are discussed in the previous section. Specific land use designations for this route are addressed by the applicable land use documents discussed in the sections below.

U. S. Forest Service

The majority of the National Forest 06 Road Alignment is under jurisdiction of the Tahoe National Forest's management plan. The U.S. Forest Service (USFS) is responsible for managing its land holdings within the Plan area. For placement of a pipeline within National Forest property coordination and approval from USFS would be required.

Placer County General Plan and Zoning Code

The entire National Forest Service 06 Road Alignment lies within the Placer County General Plan planning area. The middle section of the route is designated Forest and Open Space by the 1994 Placer County General Plan and is zoned for Agriculture/Forestry by the Placer County Zoning Code (PCC).

Based on a review of the PCGP Land Use element, the lands on which the pipeline would be located are zoned Forest, Residential/Agriculture and Single Family Residential. The zoning for these designations allows a public utility agency to install necessary facilities with a minor use permit. In addition, the California Government Code, Section 53091, exempts local agencies

from conforming to building and zoning regulations when the project facility is intended for the production, generation, storage, or transmission of water. The only exceptions to the water operations facilities exemption are structures that would function solely as equipment storage yards or buildings, or administrative centers such as an office building or "call center." Therefore, SVPSD would not be required to obtain a minor use permit from the County to construct raw water storage, water treatment plant, or finished water storage facilities on any lands that have been zoned by Placer County, including Forest, Residential Agriculture, and Single Family Residential-zoned lands. Therefore, the construction and operation of a water supply pipeline by SVPSD would be consistent with the PCGP and no General Plan amendment would be required for the proposed use.

Martis Valley Community Plan

The Martis Valley is characterized by a broad range of land uses, including timber and forest, public and private recreation areas, residential development, much of which is comprised of second homes, a multi-season resort, an airport and some commercial and industrial development.

The Forestry, Timberland Production, and Open Space land use designations provide for the preservation and production of natural resources. Residential development is not an allowed use within these districts. Land designated as Open Space will remain open for scenic, recreational or other open space purposes and/or for resource preservation (MVCP, 2003).

These land use designations all support the installation of "necessary public utility" such as a water supply pipeline (MVCP, 2003). The northeastern portion of the pipeline alignment, near Schaffer Mill Road and the Airport, is located within the MVCP. Therefore, there are no apparent land use constraints that would restrict SVPSD from installing the water supply pipeline within Martis Valley.

Squaw Valley General Plan

Based on our literature reviews, there appear to be no outstanding issues regarding conflicting land uses in the Squaw Valley General Plan Area (SVGP). This route alternative involves a pipeline connecting to the PCWA system at Painted Rock subdivision access road in the community of Squaw Valley. Land Uses adjacent to this connecting point include High and Low Density residential. These land use designations permit the development of "structures and uses required for the operation for a public utility or performance of a government function" (SVGP, 1983). Therefore, this alternative would not conflict with the SVGP land use designations.

Summary of National Forest Road 06 Land Use

Based on our literature reviews of the aforementioned planning documents and sources, there appear to be no land use constraints associated with the development of the National Forest Road 06 Alternative of the SVPSD water supply pipeline.

Highway 89 Alignment

This alternative would begin at the Interstate 80/Highway 89 South intersection and continue along the shoulder of Highway 89 before connecting with the SVPSD water system at the Painted Rock subdivision access road in Squaw Valley. Specific land use designations for this route are addressed by the applicable land use documents discussed in the sections below.

Placer County General Plan and Zoning Code

The Highway 89 alternative crosses the Nevada/Placer County Line about 2 miles south of the Interstate 80/Highway 89 South intersections. Most of this alternative is located in Placer County under the jurisdiction of the Placer County General Plan. Based on a review of the PCGP Land Use element, the lands on which the pipeline would be located area zoned Forest, Agriculture/Timberland and Low Density Family Residential. The zoning for these designations allows a public utility agency to install necessary facilities with a minor use permit. However, the California Government Code, Section 53091, exempts local agencies from conforming to building and zoning regulations when the project facility is intended for the production, generation, storage, or transmission of water. The development of the SVPSD pipeline is expected to receive an exemption under this provision of the California Code.

Nevada County General Plan

Based on a review of the Nevada County General Plan, there appear to be no constraints on the Highway 89 Alignment with respect to allowable land uses. The Highway 89 Alignment is the only portion of the potential project located in Nevada County, and is entirely within the Truckee City limits. Land use in the incorporated area of Truckee is under the jurisdiction of the Truckee General Plan and is discussed in the following section.

Truckee General Plan 2025

The Highway 89 Pipeline Alignment would begin within the city limits of the Town of Truckee, at the intersection of Interstate 80/Highway 89 South. The Truckee General Plan (TGP) has designated an 83-acre area located at the southeast corner of the I80/Highway 89 South intersection as a Special Study Area (SSA-1) (TGP, 2006). Land use in the McIver Hill SSA-1 has not been finalized; however, possible land uses include a community college (under construction), open space and habitat conservation, and certain commercial uses. The TGP does not specify if utility development is prohibited in the SSA, but considering that future development may include a community college and commercial uses, development of a water utility pipeline does not appear to conflict with possible future land uses of the McIver Hill SSA.

Other land uses near the I80/Highway89 South intersection include Low Density Residential (LDR). Development and operation of a public utility is compatible with this land use designation.

Squaw Valley General Plan

Land Uses in the Squaw Valley community adjacent to Highway 89 include Single Family, Low Density Residential, and Agricultural/Timberland. According to the SVGP, these zoning designations allow certain permitted principle uses and structures. These land use designations allow the development of "structures and uses required for the operation of a public utility" (SVGP, 1983). Therefore, pipeline installation in the Highway 89 corridor adjacent to Squaw Valley community is compatible with the surrounding land uses.

Summary of Highway 89 Alignment

Based on our literature reviews of the aforementioned Planning documents and sources, there appear to be no constraints against the development of the Highway 89 Alternative of the SVPSD water supply pipeline.

5.4 CULTURAL AND PALEONTOLOGICAL RESOURCES CONSTRAINTS

Cultural resource constraints usually are a result of historic or pre-historic edifices, artifacts, or human remains. Such finds can result in lengthy permitting delays or costly avoidance measures. Potential issues associated with the two alternatives being considered by the SVPSD are discussed in the following section and site specific evaluations will need to be conducted for either alignment.

5.4.1 PIPELINE ALIGNMENT ANALYSIS

Highway 89 Pipeline Alignment

This alternative is located within the easement of Highway 89. This highway runs parallel to the Truckee River, which in general, would be considered a potentially sensitive area for the presence of cultural resources. The pipeline would be located within the compacted shoulder of the Highway, minimizing the likelihood of uncovering previously unknown cultural resources, however the alignment should be surveyed by a qualified Archeologist or Paleontologist to further identify any areas of particular concern. Previously documented cultural findings are often addressed in the environmental impact reports of the County General Plans and local Community Plans. For this analysis, the Nevada County Plan, Truckee General Plan, and Squaw Valley General Plan were reviewed for any areas of particular concern regarding the presence of cultural resources in the project vicinity. These findings are discussed below.

Truckee General Plan

According to the TGP, documentation of the presence of historic and prehistoric archaeological resources in Truckee is relatively limited, and much of the Town's area remains unsurveyed. In 1996, it was estimated that only between eight and twenty percent of the Town had been inventoried for cultural resources, as records associated with these surveys indicate more than 100 historic, prehistoric and historic-prehistoric sites within the Town limits. Historic and prehistoric archaeological sites scattered throughout Truckee include elements as diverse as

Native American artifacts and sites from the Martis and other cultures, 19th century charcoal production sites, Chinese work camps, and linear sections of the Overland Emigrant Trail and the Transcontinental Railroad. Almost the entire town is considered moderately to extremely sensitive in terms of cultural resources, with areas of moderate terrain, close to water sources (TGP, 2006).

The remainder of the Highway 89 Alignment is located in areas of disturbed roadway. No specific cultural constraints could be identified by our literature searches. However, the potential for the presence of cultural resources in this vicinity should be considered low to moderate, and a full records search and field survey by a qualified Archeologist and Paleontologist should be completed for environmental review.

Forest Service Road 06 Alternative

In general, areas near waterways, rivers, and streams are considered sensitive for cultural resources. Much of this pipeline alternative would be placed in an existing USFS access road. This road is not located in areas favorable to Native American settlements because it is not near any rivers or streams. Therefore, there is a low likelihood of uncovering previously undiscovered historical or prehistoric cultural resources in a disturbed roadway. Areas in the greater Truckee Basin that are considered more sensitive for containing archeological or paleontological resources are discussed below.

Martis Valley Community Plan

The Martis Valley has been surveyed for historical, archeological, and paleontological resources. The findings of these surveys have been published in several environmental documents. The Martis Valley area is generally considered rich in cultural resources. While several prehistoric sites and resources have been identified, there is a high probability that many significant cultural resources remain undiscovered within the project region. A comprehensive cultural resources inventory was completed by the Placer County Department of Museums. Phase III of the Placer County Cultural Resources Inventory focused on unincorporated areas of the County, including Martis Valley. While this survey did not indicate that prehistoric resources had been located in the planning area, the Martis Valley area falls within the center of historic Washoe territory, with primary use by the northern Washoe. The Washoe regard all "prehistoric" remains and sites within the Truckee Basin as being associated with their history. Washoe settlements, prehistoric campsites, lithic scatters, and bedrock milling stations are known to be throughout the planning area. Many sensitive resource sites are adjacent to waterways and meadow areas.

Therefore, it is possible that an archeological encounter and related-delay during construction excavation could occur. A qualified Archeologist should complete a records search and comprehensive survey of the entire pipeline alignment prior to construction to further identify any areas of concern. Moreover, in the event that buried or otherwise obscured cultural resources are encountered during project construction, work in the immediate area of any find should be suspended until a qualified archaeologist can determine the nature of the find.

Based on our literature review, there do not appear to be significant issues with respect to cultural resources for the NFS 06 Road Alignment. Although unlikely, if any new cultural resources are uncovered during construction, avoidance, mitigation, or compensatory measures would be employed as necessary.

Lake Tahoe National Forest Management Plan

Forest Service and Tribal Relations

The relationships of the Forest Service with American Indian tribal governments, communities, and organizations are important in the management and restoration of ecosystems in the Sierra Nevada and Modoc Plateau. Tribal representatives participated in the Sierra Nevada Framework Management Review and Supplemental EIS process through interagency team meetings, workshops, field trips, and presentations. The Forest Service continues to work with tribal governments through forest level government-to-government consultation to seek increased opportunities to implement the nine commitments of the SNFPA that were included in the Record of Decision (pages 52-3). At the regional level, annual Sierra Nevada tribal summits are co-hosted, on a rotating basis, by local tribes and forests. At these tribal summits, relationships and communication networks are strengthened through local examples of SNFPA commitment accomplishments and updates of works-in-progress.

The Forest Service goals are to honor the trust relationship with the Tribal governments, to encourage the participation of American Indians in national forest management, and to build on the progress made to date are met by implementing the following Record of Decision commitments:

- Work with tribal governments and tribal communities to develop mutually acceptable protocols for government-to-government and tribal community consultations. These protocols will emphasize line officers' and tribal officials' roles and responsibilities.
- We will maintain appropriate access to sacred and ceremonial sites and to tribal traditional use areas. We will consult with affected tribes and tribal communities to address access to culturally important resources and culturally important areas when proposing management that may alter existing access. After appropriate assessment and consultation, we will consider proposing mineral withdrawals and other protection of inventoried sacred sites.
- We will protect all sensitive and proprietary information to the greatest extent permitted by law. We will secure permission to release information from the tribe, tribal community, or individual who provided it prior to release to others.

5.5 ENVIRONMENTAL APPROVALS AND PERMITTING ISSUES

The potential project would require compliance with several environmental laws and acquisition of several environmental permits and approvals. This section provides a brief description of these permits and approvals and provides a proposed strategy to efficiently obtain them to meet SVPSD's desired schedule. This section assumes the pipeline will follow 1 of 2 alignments

extending from the Truckee Airport well site to the entrance of the Painted Rock subdivision and Squaw Valley along Highway 89. Crossing federal lands as well as jurisdictional tributaries to the Truckee River will trigger compliance with all federal environmental regulations, including NEPA, the Sections 401 and 404 of the Clean Water Act, Section 7 of the Endangered Species Act, Section 106 of the National Historic Preservation Act, and the Clean Air Act. In addition, state regulations must be adhered to including CEQA, the California Endangered Species Act, and the California Fish and Game Code Section 1600. Furthermore, compliance with local regulations will be reviewed by the County acting as a "responsible agency" under CEQA and also if a county action is required.

5.5.1 ENVIRONMENTAL POLICY/QUALITY ACT COMPLIANCE

CEQA Compliance

The California Environmental Quality Act (CEQA) is the primary state environmental impact disclosure law that requires the significant impacts from proposed development projects. The intent of CEQA is to foster good planning and for agencies to consider environmental issues during the planning process. Section 21067 of CEQA defines a lead agency as "the pubic agency, which has the principal responsibility for carrying out or approving a project which may have a significant effect on the environment. SVPSD is within PCWA service area and therefore, if the project is planned, operated, and financed by PCWA, they would serve as lead agency under CEQA. If however, the project is implemented by SVPSD, they would serve as lead agency under CEQA. The project may also be jointly sponsored by both PCWA and SVPSD with each agency having jurisdiction over specific areas of the project. This issue will require more discussion between the agencies as to how the CEQA disclosure requirements will be met. The lead agency under CEQA for the project and ancillary facilities would most likely require preparation of an environmental impact report (EIR).

NEPA Compliance

The National Environmental Policy Act (NEPA) is the primary national environmental impact disclosure law, requiring the significant impacts from proposed development projects be addressed and mitigated, as well as requiring project alternatives at an equal level of detail to be considered. The NEPA process is designed to create good planning and require consideration of environmental impacts in the planning phase of a project. Allowing the SVPSD's pipe to cross National Forest Land will require a Special Use Permit from the Forest Service and they must comply with NEPA. Depending upon the federal issues that arise with the project, a joint EIR/ Environmental Impact Statement (EIS) or an EIR/ Environmental Assessment (EA) would be completed to assess and disclose environmental impacts in compliance with NEPA. The lead agency under NEPA would be the Tahoe National Forest Service.

5.5.2 CLEAN WATER ACT SECTION 404

The US Army Corps of Engineers (Corps) and the Environmental Protection Agency (EPA) regulate the discharge of dredge or fill material into waters of the United States under Section

404 of the CWA ("waters of the United States" include wetlands and lakes, rivers, streams, and their tributaries). Wetlands are defined for regulatory purposes as areas "…inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated solid conditions" (333 CFR 328.3, 40 CFR 230.3). Project proponents must obtain a permit from the Corps for all discharges of fill material into waters of the United States, including wetlands, before proceeding with a proposed action. Prerequisites for the issuance of Clean Water Act Section 404 permits (nationwide or individual) is proof of compliance with the Endangered Species Act through Section 7 Consultations, the State Historic Preservation Act, and Section 401 of the Clean Water Act with a water quality certification. The potential NFS 06 Road Alignment crossing the Truckee River and Deer Creek or the potential Highway 89 Alignment crossing the tributaries on the west bank of the Truckee could require a Section 404 permit if wetlands or waters of the US would be impacted. This process can be streamlined by minimizing impacts to jurisdictional waters of the US such that Individual Permit impact area thresholds are not triggered. As such, SVPSD could apply for a Nationwide 12 (linear utilities) permit, thereby substantially reducing the permit timeline. If the project triggers more than 0.5 acres of impacts to waters of the US, an Individual Permit will be required and an alternatives analysis will be necessary. Under such a scenario, the project proponent will need to demonstrate that the project is the least environmentally damaging and prudent alternative (LEDPA) with respect to direct (construction) and indirect (growth inducing) impacts to waters of the US. ECO:LOGIC suggests the Clean Water Act Section 404 permits applications be initiated early on in the process to ensure biological surveys can be conducted during appropriate seasons.

5.5.3 CLEAN WATER ACT SECTION 401 WATER QUALITY CERTIFICATION

Section 401 of the Federal Clean Water Act provides for states to have approval authority in CWA Section 404 permits issued by the U.S. Army Corps of Engineers for projects affecting wetlands and "waters of the US". The certification process must result in a finding that the project will not impair water quality or beneficial uses of the receiving water. Either project alternative would require obtaining this certification from the Lahontan Regional Water Quality Control Board for potential impacts to Truckee River (NFS 06 Road Alignment) or the nine streams that would be crossed along the Highway 89 Pipeline Alignment. Pipeline crossing of the Truckee River and other local streams and construction-related water quality issues associated with those crossings requires a CWA 404 permit and as part of that permit issuance process, the CWA 401 certification from LRWQCB. The LRWQCB 401 unit staff was contacted as part of this constraints analysis to obtain their input on the project. They have indicated their primary concerns are soil erosion and potential increases in turbidity and suspended solids, fugitive oil and grease from heavy equipment operations near the river, potential spills of hazardous materials and others (Miller pers. comm., 2008). The tributaries to Truckee River are considered important habitat for the Lahontan Cutthroat Trout as discussed in section 3.1.1. LCT have been planted in Pole Creek and other area streams in an attempt to restore local populations. Ensuring water quality controls and BMPs are implemented and maintained, and defining construction windows will be critical in minimizing water quality

impacts as it relates to LCT and other Listed and Special Status Species mentioned in section 3.1.1 of this document. The 401 application requires payment of a one-time fee of $500 and copies of the applicant's CWA 404 permit application and related certified CEQA documents and Notice of Determination. The CWA 401 certification process can take up to six months depending on staff workloads at the Regional Board and various information requests.

5.5.4 LAHONTAN REGIONAL WATER QUALITY CONTROL BOARD - RESOLUTION NO. 6-93-08

The Water Quality Control Plan for the North Lahontan Basin (North Lahontan Basin Plan), as amended, prohibits the discharge or threatened discharge attributable to human activities of solid or liquid waste materials including soil, silt, clay, sand, and other organic materials below the high-water rim of Lake Tahoe or within the 100 year floodplain of the Truckee River or any tributary to Lake Tahoe or the Truckee River. Both potential alignments entail earth-moving activities crossing tributaries to the Truckee River and the Truckee River, itself. The Lahontan Board's Resolution No. 6-93-08 delegates authority to the Executive Officer to grant exceptions to the Basin Plan prohibitions regarding discharges of earthen materials to floodplains and stream environment zones. Exceptions are granted for specific discharges where " the projects are necessary to protect public health or safety or to provide essential public services". Exceptions for public services are allowed only when the Board makes ALL of the following findings:

- There is no reasonable alterative to locating the project or portions of the project within the 100-year floodplain.
- The project by its very nature must be located within the 100-year flood plain.
- The project incorporates measures that will insure that any erosion and surface runoff problems caused by the project are mitigated to levels of insignificance.
- The project will not, individually or cumulatively with other projects, directly or indirectly, degrade water quality or impair beneficial uses of water.
- All 100-year flood plain areas and volumes lost as a result of the project will be completely mitigation by restoration of the previously disturbed flood plain within or as close as practical to the project site.

Both potential project alignments would trigger the need a Discharge Prohibition Exception under Resolution No. 6-93-08. The exception process typically follows the same timeline as the 401 Certification. Therefore, it is estimated that the 401 Certification and Discharge Prohibition Exception process could take 6- 8 months. A beneficial use assessment may be required to verify the project does not "directly or indirectly degrade water quality or impair beneficial uses of water" in the Martis Creek basin. Such studies can add a year or more to the permitting processes.

5.5.5 STATE WATER RESOURCES CONTROL BOARD WATER QUALITY ORDER 99-08-DWQ - STATEWIDE CONSTRUCTION GENERAL PERMIT

Projects that entail land disturbance and grading of an area greater than one acre must comply with the State Water Resources Control Board Water Quality Order 99-08-DWQ. The project

proponent or contractor must prepare a Stormwater Pollution Prevention Plan (SWPPP) and submit a Notice of Intent (NOI) to the State Board. The SWPPP details the project specific erosion and sediment control Best Management Practices (BMPs) to be put in place during all construction activities to protect water quality. The Board will periodically inspect the site to ensure adherence to the SWPPP. Both potential project alignments would entail grading of over one acre and therefore trigger the need to develop and comply with a SWPPP.

5.5.6 CDFG STREAMBED ALTERATION AGREEMENT

Section 1602 of the Fish and Game code requires any person, state or local government agency, or public utility to notify the Department of Fish and Game, before beginning any activity that will do one or more of the following actions:

- Substantially obstruct or divert the natural flow of a river, stream or lake,
- Substantially change the bed, channel, or bank of a river, stream or lake,
- Use any material from the bed, channel, or bank of a river, stream or lake, and/or,
- Deposit or dispose of debris, waste, or other material containing crumbled, flaked or ground pavement where it can pass into a river, stream or lake.

Section 1602 applies to all perennial, intermittent, and ephemeral river, streams and lakes in the state. The SVPSD project will require acquisition of a Streambed Alteration Agreement from CDFG due to installation of the water supply pipeline across the Truckee River or due to the crossing of many tributaries. In addition, the pipeline may cross other water features regulated by CDFG, such as minor streams and drainages. The legal timeline for CDFG review and issuance of a Streambed Alteration Agreement is 90 days; however, in practice the permit timeline is often much longer.

5.5.7 GENERAL PLAN COMPLIANCE

According to California Government Code 53091(d), “zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment or transmission of water”. However, as a “responsible agency” under CEQA, the County will review the project for local land use plan compliance and provide comments to the lead agency. In addition, if the project entails a County or local agency discretionary action (i.e. issuance of a grading permit), all local ordinances will apply.

5.5.8 PRELIMINARY PERMITTING STRATEGY

We recommend that once the team identifies the preferred pipeline alternative, SVPSD initiate the CEQA process and discuss with the Tahoe National Forest if they are amenable to preparing a joint environmental document (if NFS 06 Alignment is chosen). The goal of preparing a joint document is to streamline the state and federal environmental review process in one step. If they agree, a Notice of Preparation/Notice of Intent would be prepared for the joint document. We believe at this juncture, with a project of this magnitude and complexity that preparation of an EIR will be required given the ongoing Martis Valley groundwater debate and is in the best

interest of SVPSD to document an open and transparent process. The EIR process will most likely take up to 12-16 months to complete. Of all the permits and approvals required for this project, the CWA 404 permit (with its associated Historic Preservation Act, Endangered Species Act, and Clean Water Act Section 401 compliance/certification) are the most problematic and require the most time to obtain. In a parallel effort with CEQA, we suggest SVPSD begin preparing permit applications and developing the required information for Clean Water Act 404 compliance. Section 404 permits can take up to a year or more to obtain. This will include formal wetland delineation of the project areas and submittal to the COE.

5.5.9 FUNDING CONSIDERATIONS

Our recent experience with other public infrastructure projects has revealed that if municipal bonds are used for funding, some bond underwriters require that all environmental permits and approvals be secured prior to the issuance of the bond offering for public sale. This requirement is not unique and should be considered by SVPSD in the overall project schedule. Therefore, a detailed schedule of the project will be prepared by ECO:LOGIC to ensure that financing requirements are incorporated with linkages to other permits and approvals.

5.6 SUMMARY

5.6.1 LISTED AND SPECIAL STATUS SPECIES

Plant Species

A desktop analysis of potential special status plant species within either pipeline alignment indicates a low to medium potential of listed status plant species being present. There is a medium potential for occurrence of Donner Pass buckwheat, Plumas ivesia, Marsh skullcap, and American manna grass. Three other species that have a low potential of impact from the proposed project are the Carson Range rock cress, the Nevada daisy, and Munroe's desert mallow because the project alignments are outside of the range of known populations of these species. The County will need to be consulted to determine if a tree removal permit is needed, if so, the timeline takes approximately one month to complete. Potential impacts and mitigation measures will need to be addressed in the CEQA/NEPA document.

Fish and Amphibians

The Lahontan cutthroat trout and mountain yellow-legged frog are known to occur in tributaries to the Truckee River. Both species have a low potential for occurrence within the area of either alignment. The Lahontan cutthroat is limited to Pole Creek upstream of a natural barrier where it cannot be harmed by predators; however, populations have been encountered in Martis Creek within in the past 8 years (CNDDB, 2008). The mountain yellow-legged frog federal listing only applies to San Gabriel, San Jacinto, and San Bernardino Mountain populations. The frog was historically found along Squaw Creek and in Squaw Meadow upstream from the end of both alignments. The last registered sighting of the frog in the project area was in the 1960s. Federally listed species and their habitat are protected under the Federal ESA. Therefore potential impacts to these species' habitat will require USFWS consultations.

Nesting Raptors and Migratory Birds

Our review of the potential for special-status animal species to inhabit the either potential pipeline alignment indicates that nesting raptors and other migratory birds (northern goshawk, spotted owl, bald eagle, yellow warbler, willow flycatcher, and the osprey) would be protected and impacts to these species, should they nest on site, could be avoided by construction windows and/or nest buffer planning. There is known northern goshawk habitat along the NFS 06 Road Alignment indicating a greater lever for occurrence than along the Highway 89 Alignment. Protocol-level spotted owl surveys may be required along the NFS 06 Road Pipeline Alignment (pers. com. USFS, 2008). Other nesting raptor surveys may be required as well.

Mammals

The long-legged myotis, California wolverine, Sierra Nevada mountain beaver, and the Sierra Nevada red fox have a medium potential to be impacted by either alignment. There is suitable habitat along both alignments and the species range is known to cover all or part of the project area. The Sierra Nevada Mountain Beaver has a greater chance of potential impact from the Highway 89 Alignment, since it is known to occur in several of the tributaries to the Truckee that the alignment will cross. Other mammals that could possibly be impacted by either alignment (low potential) are the Sierra Nevada snowshoe hare, the Sierra pine marten, and the western white-tailed jackrabbit.

Summary

Based on our literature review, the Army Corps of Engineers will likely need to conduct Federal ESA Section 7 consultations with the USFWS for the federal species mentioned above. If there is a potential to "kill, harm or harass" a federally listed species or disturb its habitat, formal consultations and an incidental take permit will be required. This permit process can take over one year to complete; therefore, it is recommended the permit process begin early in the project design phase.

5.6.2 WATERS OF THE US

The potential NFS 06 Road Alignment will be drilled under the Truckee River, thereby likely avoiding Corps jurisdiction (and impacts to aquatic species); however, the project will cross Deer Creek and may cross wetlands or other jurisdictional waters of the US. Additionally, the potential Highway 89 Alignment will cross multiple tributaries to the Truckee River and possibly unidentified wetlands. Wetland delineations should be the first steps once the pipeline route is defined. If impacts to wetlands/waters of the US can be reduced to less than 0.5 acres, the SVPSD may qualify for coverage under a Nationwide Permit #12 for Utility lines. If the impact area is larger than 0.5 acres, the District will need to apply for an individual permit. The Army Corps of Engineers will require avoidance, mitigation, or compensation for any proposed activities that would entail fill in jurisdictional waters of the US.

5.6.3 LAND USE

Based on our literature reviews of the relevant planning documents and sources, there appear to be no land use constraints associated with the development of the National Forest 06 Road Alignment or the Highway 89 Alignment of the SVPSD water supply pipeline.

5.6.4 CULTURAL RESOURCES

Based on our literature review, no specific cultural constraints could be identified along either potential alignment. However, the potential for the presence of cultural resources in the vicinity should be considered low to moderate, and a full records search and field survey by a qualified Archeologist or Paleontologist should be completed prior to any construction. If any new cultural resources are uncovered during construction, avoidance, mitigation, or compensatory measures will need to be employed as necessary.

5.6.5 ADDITIONAL ENVIRONMENTAL CONSIDERATIONS

In general, both projects would require Best Management Practices (BMPs) and possible mitigation measures to minimize potential environmental impacts to less than significant with regards to CEQA. Many of these standard BMPs can be included in the project description as environmental commitments the District is willing to make upfront in the process. Potential impacts on air quality, water quality, hydrology, geology, traffic, recreation, and climate change will need to be addressed in the CEQA/NEPA document for either alignment.

5.6.6 PERMITS AND APPROVALS

The potential project will likely trigger the following permit/environmental compliance requirements:

- California Environmental Quality Act Compliance
- National Environmental Quality Act Compliance (NEPA- Forest Service Route)
- Clean Water Act Sections 401 and 404 Permits/Certifications
- Lahontan Regional Board Discharge Prohibition Exception under Resolution No. 6-93-08
- US Fish and Wildlife Service Endangered Species Act Section 7 consultations
- State Historic Preservation Office NHPA Section 106 consultations
- California Fish and Game Code 1602 Permits
- Placer County Grading Permit
- Placer County Tree Permit

The timeline for these permits ranges from several weeks to over one year. Several of these permits, such as the Clean Water Act Section 404 permit can be streamlined by designing the project to avoid (to the extent feasible) and minimize impacts to jurisdictional waters of the

United States. Such measures will enable SVPSD to apply for coverage under existing nationwide permits rather than go through the longer process of obtaining and individual permit. **Table 5-3** illustrates the necessary permits and required timeline for each.

Table 5-3
Permit Timeline

Permit Name	Trigger	Estimated Timeline*
CEQA Compliance	Discretionary Action by a SVPSD	1 year to 18 months
NEPA Compliance	Special Use Permit from National Forest Service	12-16 months
Clean Water Act 401 Certification (and Board - Resolution No. 6-93-08)	Surface Waters of the US	4-5 months
Wetland Delineation Verification	Waters of US (ordinary high water mark) and wetlands	6-8 months
Clean Water Act 404 Permit	Waters of US wetlands/vernal pools (ordinary high water mark)	1 year to 18 months
USFWS ESA Section 7 Consultations	Federally listed species of potential habitat for federally listed	7-8 months (assuming formal consultations)
SHPO NHPA Section 106 Consultations	Cultural Resources	2-3 months
CFG Code 1602 Permits	Impacts to Bed/Bank and floodplain	4-5 months
Placer County Tree Permit**	Removal of trees 6 " dbh or greater	1-2 months
Encroachment Permits (Caltrans and local agency)	Placement of pipeline within Caltrans or County Easements	2-6 months
Grading Permit and SWPP	County grading permit and State SWPPP for grading areas > 1 acre	2-6 months

* Estimated Timeline includes APPROXIMATIONS for ECO:LOGIC's time to prepare an application and the agency's review period.

** Public Utilities may be exempt.

Appendix A

Listed and Special Status Species

ANIMAL SPECIES

LAHONTAN CUTTHROAT TROUT

Federally Threatened Lahontan cutthroat trout (Oncorhynchus clarkia henshawi) is known to exist within three miles of both potential pipeline routes (CNDDB, 2008). The Lahontan cutthroat trout is found in cold waters of the Lahontan Basin. The trout cannot tolerate the presence of other salmonids and require gravel riffles in streams for spawning (CNDDB, 2008). The Lahontan cutthroat trout typically spawn from April to July. According to CDFG, populations historically were found in Martis Creek, Independence Creek, Independence Lake, the Truckee River, and Pole Creek (USFWS, 1995; CNDDB, 2008). Truckee River populations have been historically monitored and stocked by the USFWS and CDFG (John Hiscox, Pers. Com.); however, stocked populations with no barrier to passage are typically rapidly depredated by brown trout. Currently known populations occur in Pole Creek and Martis Creek (CNDDB, 2008). This species tolerates varying stream conditions; however, it does not typically occur in streams utilized by other salmonids (CNDDB, 2001). The National Forest Service 06 Road Pipeline Alignment will intersect the Truckee River upstream of Pole Creek and Martis creeks. The potential Highway 89 Alignment runs adjacent to the Truckee River and will cross Pole Creek. Impacts to Lahontan cutthroat trout will need to be analyzed in the CEQA/NEPA document and through Section 7 consultations with the USFWS. Jack and bore operations with stringent erosion control BMPs will serve to minimize impacts to LCT and facilitate USFWS ESA consultations.

SPOTTED OWL

The spotted owl (*Strix occidentalis*); is a species of concern to state and federal resource agencies and is a USFS "sensitive" species. According to the US Forest Service, spotted owls are present within three miles of both potential pipeline alignments and special precautions to avoid impact should be taken (Roubique, pers comm. 4/14/08). Critical habitat for the spotted owl is considered mixed-coniferous forest. Spotted owls are nocturnal and have yearlong activities. Spotted Owl's reside in dense, old growth, multi-layered mixed conifer, redwood, and Douglas-fir habitats, from sea level up to approximately 2300 m (0-7600 ft). The Spotted owl requires blocks of 40-240 ha (100-600 ac) of mature forest with permanent water and suitable nesting trees and snags (Forsman 1976). In northern California the spotted owl prefers narrow, steep-sided canyons with north-facing slopes. There is potential for spotted owls within either pipeline alignment, either along the west facing cliffs along the Truckee River or along the NFS 06 Road. Surveys would need to be conducted and active spotted owl nests would require a year round no-construction a buffer of 500 feet (USFS, 2004).

NORTHERN GOSHAWK

Another species of concern is the Northern goshawk (*Accipiter gentiles*), listed as a State species of Special Concern (CNDDB, 2008). The Northern goshawk is found within and near coniferous forest. It uses old nests, and maintains alternate nest sites on north slopes near water in red fir, lodgepole pine, Jeffrey pine, and aspens. There is a potential for disturbance to northern goshawk nesting habitat along the NFS 06 Road Pipeline Alignment. As is it possible, but unlikely, that the potential Highway 89 Pipeline will disturb the northern goshawk nests. The northern goshawk is known to inhabit Sawtooth Ridge, an area 4 miles southwest of the Truckee airport and adjacent to the National Forest 06 Road where the NFS 06 Road Alignment would be located (CNDDB, 2008). Goshawk nests located near the pipeline will likely require a 500 foot buffer, if they are found to be active immediately prior and during the time of construction.

SIERRA NEVADA MOUNTAIN BEAVER

The Sierra Nevada mountain beaver (*Aplodontia rufa californica*) is listed as a State species of Special Concern (CNDDB 2008). The Sierra Nevada Mountain Beaver is known to inhabit dense growths of small deciduous trees and shrubs, wet soil, and abundance of forbs in the Sierra Nevada and the East slope. The mountain beaver needs dense understory for food and cover, since it burrows into soft soil and needs an abundant supply of water (CNDDB, 2008). Cabin Creek and Pole Creek are tributaries to the Truckee River and are known locations of the Sierra Nevada mountain beaver. Since the first potential alignment follows the National Forest Service Road, and is not near an abundance of water the Sierra Nevada mountain beaver is not likely to be affected by the potential project activities. The potential NFS 06 Alignment would be drilled under the Truckee River creating a potential disturbance to mountain beaver habitat. The second potential alignment, the Highway 89 pipeline alignment, will be parallel to the Truckee River and cross over both tributary creeks, creating a potential disturbance to mountain beaver habitat. Potential Impacts to mountain beaver from either alternative would need to be mitigated under CEQA.

WILLOW FLYCATCHER

The willow flycatcher (*Empidonax traillii*) is listed as a California Endangered species (CNDDB, 2008). This species breeds in the Sierra Nevada from May to September in elevations ranging from 2,000-8,000 feet above MSL. The willow flycatcher inhabits extensive thickets of low dense willows on the edge of wet meadows, ponds, or backwaters. Potential willow flycatcher habitat within three miles of either potential alignment is along the Truckee River, along Deer Creek, and along Martis Creek (CNDDB, 2008). Surveys for willow flycatcher would need to be conducted as a part of the CEQA process and if found, impacts to nesting birds would need to be mitigated.

SIERRA NEVADA SNOWSHOE HARE

The Sierra Nevada snowshoe hare (*Lepus americanus tahoensis*) is listed as a CDFG species of Special Concern (CNDDB, 2008). This species, a subspecies of *Lepus americanus*, is restricted to the Sierra Nevada mountain range and population numbers are thought to be low (Zeiner *et.*

al., 1990b). Sierra Nevada snowshoe hares occupy young growth mixed conifer, subalpine conifer, red fir, Jeffrey pine, lodgepole pine, and aspen forests and often utilize habitats characterized with dense understory growth located along forest edges in close proximity to meadows (Zeiner et. al., 1990b). The open road nature of both the potential NFS 06 Pipeline Alignment and the Highway 89 Pipeline Alignment are unlikely habitats for the snowshoe hare. However, the Truckee River and its tributaries are potential habitat for the Sierra Nevada snowshoe hare. Therefore, potential impacts to snowshoe hare would need to be mitigated under CEQA.

YELLOW WARBLER

The yellow warbler (*Dendroica petechia brewsteri*), a California species of Special Concern is known east of both potential alignments south of Mt. Watson and west of both alignments at the east end of Donner Lake (CNDDB, 2008). This migratory species arrives in California in April and typically leaves the northern California region by October. In the Sierra Nevada, this species occurs in open canopy coniferous forests up to 8,000 feet above MSL. Habitat is vegetation mostly a mosaic of quaking aspen stands, mixed conifer forest, and small areas of montane chaparral sagebrush scrub. The yellow warbler is also known to exist in close proximity to streams. The lack of water and high disturbance along the NFS 06 Road Pipeline Alignment indicates that warbler habitat is unlikely, however is possible and mitigation would be required if present. The Highway 89 Pipeline has available water adjacent to the alignment, therefore, warbler habitat is possible and mitigation would be required if present.

CALIFORNIA WOLVERINE

The State Threatened California wolverine (*Gulo gulo*) was seen one-quarter mile inside the entrance to Squaw Valley in 1953 and just recently documented on camera in the area 8.4 miles north of Truckee on Highway 89 near the Forest Service Sagehen monitoring station (CNDDB, 2008). The wolverine is found in the north Coast Mountains and the Sierra Nevada in a variety of high elevation habitats. In the northern Sierra Nevada, wolverines occur in mixed conifer, red fir, and lodgepole forests ranging from 4,300-7,300 feet above mean sea level (MSL) (CNDDB, 2008). The wolverine needs a water source and uses caves and logs to burrow for cover and den sites. Wolverines hunt in more open areas and are known to travel long distances (CNDDB, 2008). Wolverines are known to avoid human inhabited areas, so it is unlikely the Highway 89 Pipeline Alignment would impact wolverine habitat. It is more plausible for the wolverine to be present near the NFS 06 Road Pipeline Alignment, since it is relatively uninhabited by people. Potential impacts will need to be addressed and mitigated in the CEQA document.

WESTERN WHITE-TAILED JACKRABBIT

The western white-tailed jackrabbit (*Lepus townsendii*) is, according to CDFG, a state species of Special Concern. The jackrabbit was seen in 1920 near Tahoe City, California. Jackrabbit habitat consists of sagebrush, subalpine conifer, juniper, alpine dwarf shrub, and perennial grasslands. The jackrabbit prefers open areas with scattered shrubs and exposed flat-topped hills

with open stands of trees, brush, and herbaceous understory (CNDDB, 2008). Potential Impacts western white-tailed jackrabbit would need to be mitigated under CEQA/NEPA.

MOUNTAIN YELLOW-LEGGED FROG

The mountain yellow-legged frog (*Rana muscosa*) is a Federally Endangered species, a State species of Special Concern and a USFS sensitive species; however, the Federal listing refers to populations in the San Gabriel, San Jacinto, and San Bernardino mountains only (CNDDB, 2008). This species is found associated with lakes, streams, and ponds in elevations ranging from 1,200 feet to 7,500 feet above mean sea level (MSL) (Zeiner *et. al.*, 1988). Known populations of frogs occur in the Granite Chief wilderness area west of Squaw Valley, in the Squaw Valley meadow, and in Grey Creek a Truckee River tributary approximately 11miles east of the Town of Truckee. Surveys for mountain yellow-legged frog habitat will need to be conducted along the route. Potential impacts to the species and habitat will need to be addressed in the CEQA/NEPA document and through Section 7 consultations.

OSPREY

The osprey (*Pandion haliaetus*) is listed by the California Board of Forestry as a "Listed species" and "Sensitive Species". It also designated as a "Sensitive Species" by the U.S. Forest Service. The Department of Fish and Game listed the osprey as a second priority Species of Special Concern in 1978. The Osprey commonly nests within the forested habitats of California adjacent or near to rivers or large water bodies. Known populations of the osprey are known to occur on the southern side of Donner Lake on the west side of the Town of Truckee. Osprey habitat is possible along the Truckee River. Potential Impacts associated with either alignment would need to be mitigated under CEQA.

SIERRA NEVADA RED FOX

The Sierra Nevada red fox (*Vulpes vulpes necator*) is known to occur within three miles of the project location. The fox is listed by the state of California as a Threatened species. This species is also a USFS "sensitive" species. This species is typically found in higher elevations (>7,000 feet above MSL) but is known to occur in elevations as low as 3,900 feet above MSL. Sierra Nevada red fox occurs in a variety of habitats, including lodgepole pine, mixed conifer, montane riparian, and ponderosa pine forests within the Sierra Nevada mountain range. This species requires dense vegetation for cover and prefers habitats adjacent to meadows for hunting. The Sierra Nevada red fox dens in rock outcrops and hollow logs and is known to burrow in friable soils. Population numbers of this species are declining and this species is rare throughout its range (Zeiner *et. al.*, 1990b). Potential impacts to red fox including temporary disturbance of foraging areas will need to be addressed and mitigated in the CEQA/NEPA document.

PLANT SPECIES

PLUMAS IVESIA

The Plumas ivesia (*Ivesia sericoleuca*) is known to occur within three miles of the pipeline alignments. Listed by CNPS as 1B.2, the Plumas ivesia is a great basin scrub, found in lower montane coniferous forests, meadows, and vernal pools usually in substrates from 1450 meters to 2000 meters. Populations of Plumas ivesia have been found near the Truckee Airport. Since Plumas ivesia is typically found vernal pools and meadows it is not likely that there is suitable habitat along either pipeline route and would not pose a serious constraints to these pipeline corridors.

NEVADA DAISY

The Nevada daisy (*Ergeron nevadincola*) is a great basin scrub, found in lower montane coniferous forest and pinyon-juniper woodland from 1400 to 2900 meters. The Nevada daisy is listed by CNPS as 2.3, a rare plant that needs more information. The daisy is found in the Tahoe City USGS 7.5 minute quad near Deer Park above the summit of "The Craggs." Potential impacts to the Nevada daisy will need to be addressed in the CEQA/NEPA document.

CONSTANCE'S SEDGE

Constance's sedge (*Carex constancea*) is listed by CNPS as 1B.2 and known to occur near Sagehen Creek in the experimental forest area. Constance's sedge is found in subalpine coniferous forests normally in the shade (CNDDB, 2008). Potential Impacts to Constance's sedge will need to be addressed in the CEQA/NEPA document.

DONNER PASS BUCKWHEAT

Donner Pass buckwheat (*Eriogoonum umbellatum var. torreyanu*) is listed as a CNPS 1B.2 species. Donner Pass buckwheat is found in upper montane coniferous forest, chaparral, and meadows. Normally located on steep slopes and ridge tops in rocky volcanic soils surrounded by bare or sparsely vegetated areas (1840-2620meters). Known to occur in the upper reaches of Squaw Creek and near Highway 89 at the junction of Squaw Valley Road. Further analysis of Potential Impacts will be needed in the CEQA/NEPA document.

AMERICAN MANNA GRASS

Listed by CNPS as a 2.3, American manna grass (*Glyceria grandis*) is found in wet meadows, ditches, streams, and ponds in valleys and lower elevations in the mountains from 15 to 1980 meters. Manna grass is known to occur in the Truckee River near Squaw Creek, indicating a high potential of presence near the alignment. Detailed surveys and potential Impacts to American manna grass will need to be conducted for the CEQA/NEPA document.

MARSH SKULLCAP

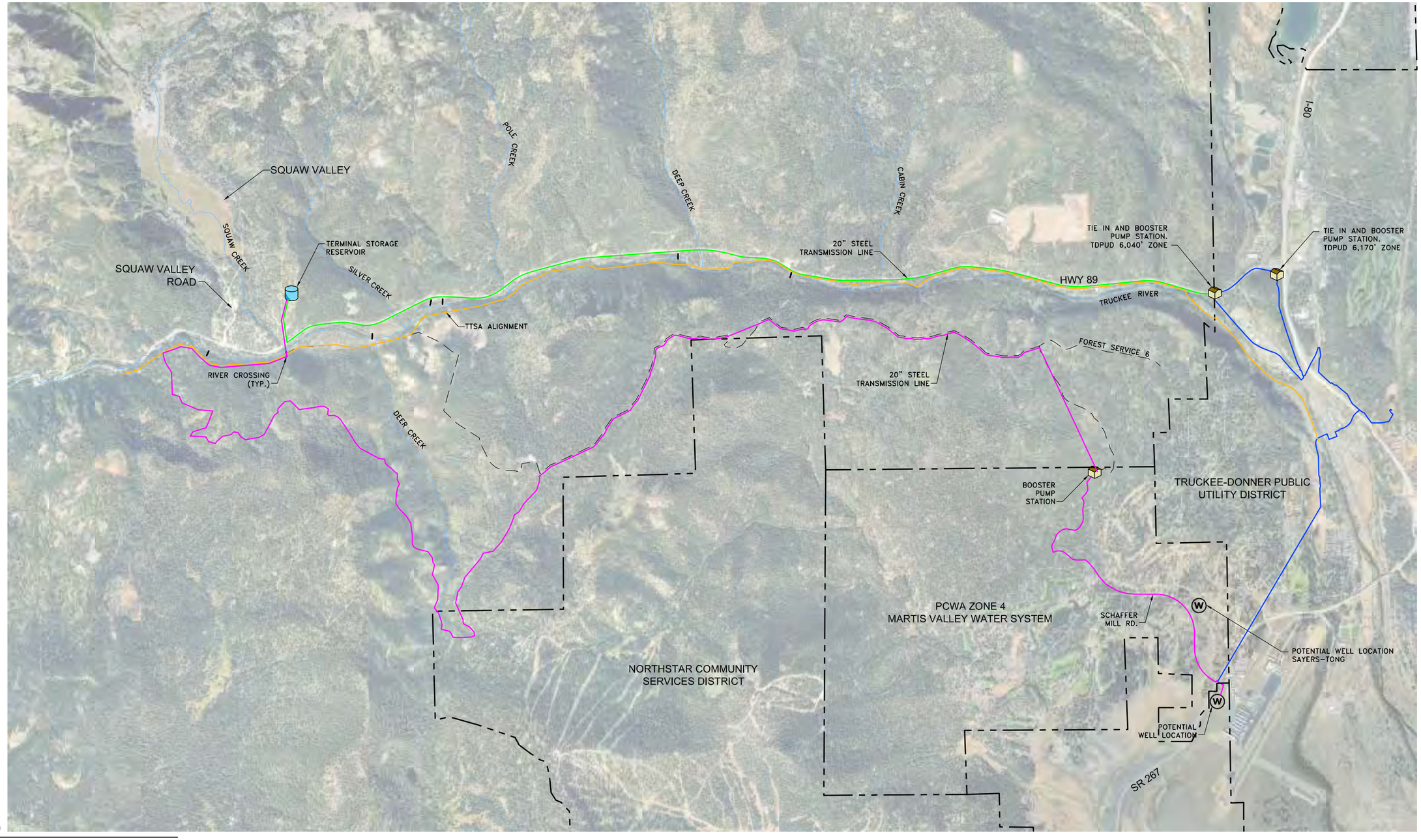
Marsh skullcap (*Scutellaria galericulata*) is listed by CNPS as a 2.2 species. Found in marshes and swamps throughout lower montane coniferous forest, meadows, and seeps the marsh skullcap could potentially be found in or near the Truckee River and its tributaries. The skullcap is found from 0 to 2100 meters and is known to occur near Truckee. Potential Impacts will need to be addressed in the CEQA/NEPA document.

MUNROE'S DESERT MALLOW

Munroe's desert mallow (*Sphhaeralcea munroana*) is listed by CNPS as a 2.2 species. It is a Great Basin scrub found around 2000 meters in dry open places. Munroe's desert mallow is known to occur on slopes above Squaw Creek. The potential for encountering desert mallow is considered low because the Highway 89 pipeline alignment will be located primarily on the valley floor where the predominant habitat is wet meadow and the NFS 06 Road Pipeline Alignment will cross the Truckee River in an area that is predominately wet meadow. However, there are patches of sagebrush scrub habitat in pocket areas. Since the pipeline alignments are in the vicinity of Squaw Creek, surveys may need to be conducted if suitable habitat exists in the final alignment and proper CEQA/NEPA mitigation measures and analysis will be needed.

TAHOE YELLOW CRESS

Only one plant species in the CNDDB search is listed under the State or Federal Endangered Species Act. The Tahoe yellow cress is listed as Endangered in California and as a Federal Candidate species (CNPS: 1B.1). The Tahoe yellow cress (*Rorippa subumbellata*) has been documented within three miles of the potential pipeline route. However, this species primarily inhabits sandy beaches, lakeside margins, and riparian communities; on decomposed granite sand. Therefore, the dry mixed coniferous habitat, previously disturbed dirt and paved roads, and the lack of wetlands along the NFS 06 Road Pipeline Alignment does not provide suitable habitat for Tahoe yellow cress. Neither does the paved shoulder of Highway 89; however, the nearby Truckee River and its tributaries provide habitat for the yellow cress. Potential impacts to the species and habitat will need to be addressed in the CEQA document and through Section 7 consultations.



LEGEND

- WATER PURVEYOR BOUNDARY
- FOREST SERVICE ROAD 6
- HWY 89 ALIGNMENT
- U.S. FOREST SERVICE CORRIDOR ALTERNATIVE
- TDPUD EXISTING PIPELINES
- TTSA ALIGNMENT
- TERMINAL STORAGE RESERVOIR
- BOOSTER PUMP STATION
- (W) POTENTIAL WELL LOCATIONS

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2000' 1000' 0 2000'
FULL SIZE PAPER 22" x 34"
1" = 2000'

2000' 1000' 0 2000'
HALF SIZE PAPER 11" x 17"
1/2" = 2000'

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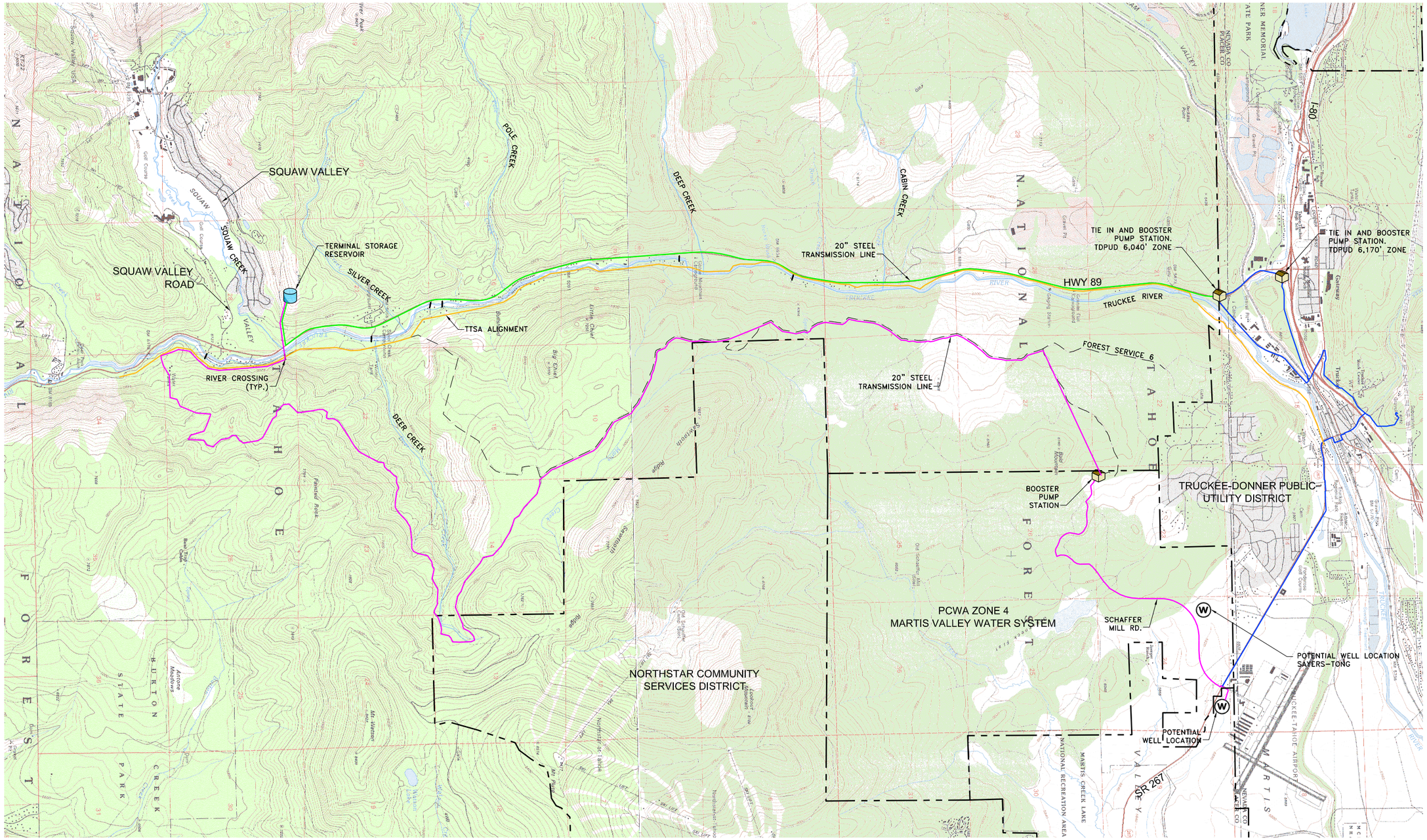
SQUAW VALLEY PUBLIC SERVICE DISTRICT

ALTERNATIVE/SUPPLEMENTAL WATER SUPPLY AND ENHANCED UTILITIES FEASIBILITY STUDY

SHEET TITLE:
ENVIRONMENTAL CONSTRAINTS ANALYSIS STUDY AREA

JOB #	SQAW07-007
DATE	AUGUST 2009
SCALE	AS SHOWN
DESIGNED	KDA
DRAWN	RJG
CHECKED	DTH

FIGURE NUMBER
5-1



LEGEND

- WATER PURVEYOR BOUNDARY
- FOREST SERVICE ROAD 6
- HWY 89 ALIGNMENT
- U.S. FOREST SERVICE CORRIDOR ALTERNATIVE
- TDPUD EXISTING PIPELINES
- TTSA ALIGNMENT
- TERMINAL STORAGE RESERVOIR
- BOOSTER PUMP STATION
- (W) POTENTIAL WELL LOCATIONS

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SQUAW VALLEY PUBLIC SERVICE DISTRICT

ALTERNATIVE/SUPPLEMENTAL WATER SUPPLY AND ENHANCED UTILITIES FEASIBILITY STUDY

SHEET TITLE:
ALIGNMENT CORRIDORS USGS BACKGROUND

JOB #	SQAW07-007
DATE	AUGUST 2009
SCALE	AS SHOWN
DESIGNED	KDA
DRAWN	RJG
CHECKED	DTH

FIGURE NUMBER
5-2

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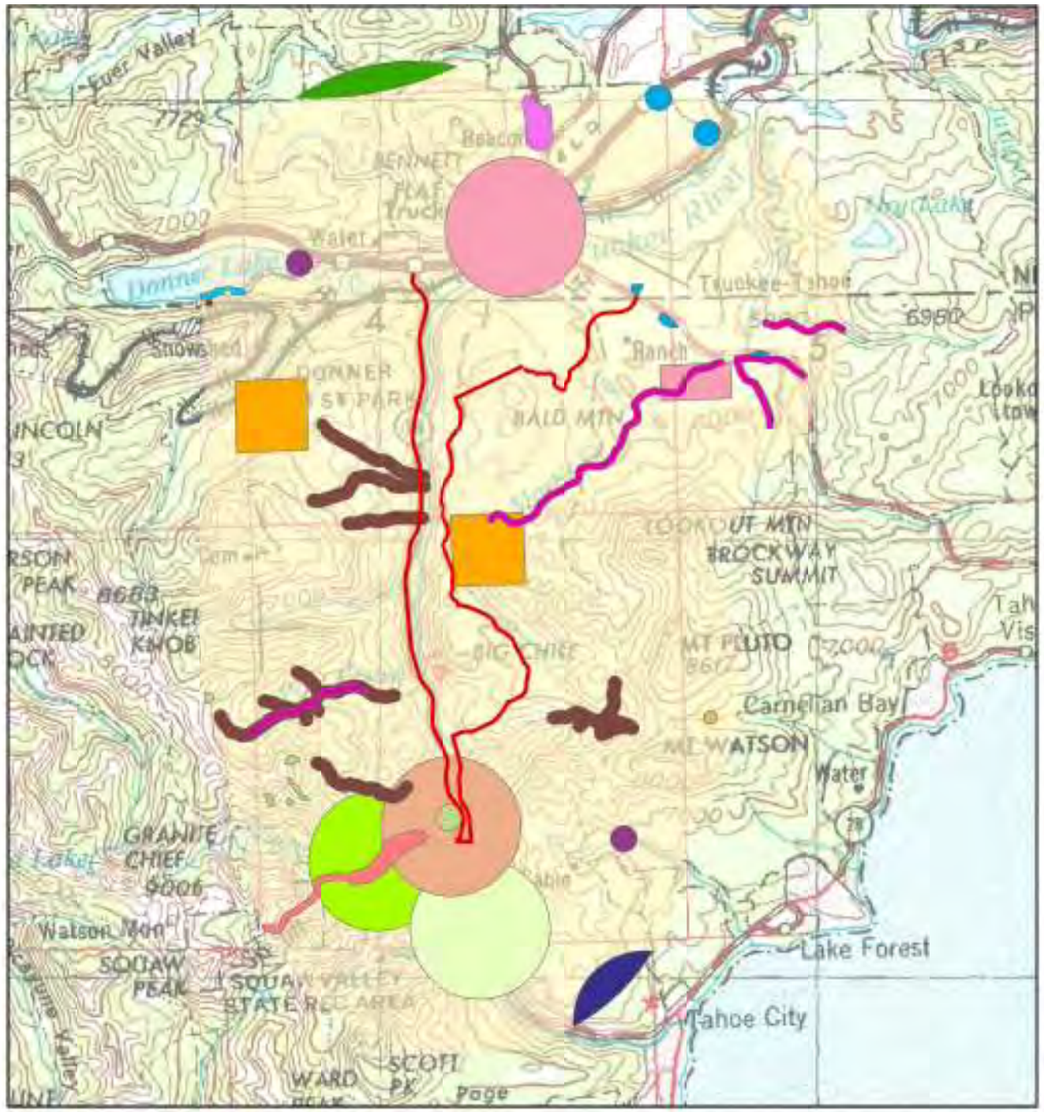

Legend

- Potential SVPSD Alignment Alternatives
- Three Mile Buffer

Special Status Species

- yellow warbler, Dendroica petechia brewsteri
- willow flycatcher, Empidonax traillii
- western white-tailed jackrabbit, Lepus townsendii
- Sierra Nevada mountain beaver, Aplodontia rufa californica
- Sierra Nevada snowshoe hare, Lepus americanus tahoensis
- Sierra Nevada red fox, Vulpes vulpes necator
- California wolverine, Gulo gulo
- long-legged myotis, Myotis volans
- mountain yellow-legged frog, Rana muscosa
- Lahontan cutthroat trout, Oncorhynchus clarki henshawi
- osprey, Pandion haliaetus
- northern goshawk, Accipiter gentilis
- bald eagle, Haliaeetus leucocephalus
- Tahoe yellow cress, Rorippa subumbellata
- Plumas ivesia, Ivesia sericoleuca
- Oregon fireweed, Epilobium oregonum
- Ivanish skullcap, Scutellaria galericulata
- Nevada daisy, Erigeron nevadincola
- Munroe's desert mallow, Sphaeralcea munroana
- Donner Pass buckwheat, Eriogonum umbellatum var. torreyanum
- Constance's sedge, Carex constanceana
- American manna grass, Glyceria grandis

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SQUAW VALLEY PUBLIC SERVICE DISTRICT

ALTERNATIVE/SUPPLEMENTAL WATER SUPPLY AND ENHANCED UTILITIES FEASIBILITY STUDY

SHEET TITLE:
SPECIAL-STATUS SPECIES KNOWN TO OCCUR WITHIN THREE MILES OF THE PROPOSED PIPELINE ALIGNMENT ALTERNATIVES

JOB #	SQAW07-007
DATE	AUGUST 2009
SCALE	AS SHOWN
DESIGNED	KDA
DRAWN	BB
CHECKED	DTH

FIGURE NUMBER
5-3

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Aug 17, 2009 - 3:40pm

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ENGINEERS · CONSULTANTS

Squaw Valley Public Service District - Alternative/Supplemental Water Supply and Enhanced Utilities Feasibility Study

Technical Memorandum No. 6 - Final

Planning Level Facilities Cost Estimate

Prepared For: Richard Lierman, General Manager

Prepared By: Ken Angst, P.E.
David Hunt, P.E.

Reviewed By: John Enloe, P.E.

Date: September 29, 2009

6.1 PURPOSE

This technical memorandum summarizes the required project facilities and provides planning level cost estimates for both the Highway 89 corridor and USFS corridor alternatives.

6.2 DISCUSSION

6.2.1 WATER SUPPLY FACILITIES COST SUMMARY

There are four different facilities that are needed to construct the Supplemental Water Supply Project. Each of these facilities are similar regardless of alignment alternative. They include the following:

- Well Construction (2,000 gpm capacity)
- Transmission Line
- Booster Pump Station
- Terminal Tank

ECO:LOGIC developed a detailed planning level cost estimate for each one of these facilities for each of the two potential alignments (Figure 6-1). The costs for the well and terminal water storage tank are similar for each option. The cost for transmission line construction for each alternative is different due to the fact the pipelines follow two completely different routes from the Martis Valley to Squaw Valley. The cost for the booster pump station is different based on the required pumping head for the two alternatives, with the USFS alternative requiring much higher horsepower pumps.

In addition to the four facilities described above, line items have also been added for the following:

- EIR preparation, environmental permitting, and preliminary planning and design
- Administrative and legal costs associated with land acquisition, easements, etc.
- Design engineering and construction management
- Construction contingency

Table 6-1 provides a side by side comparison of the summary costs associated with each alignment based. A more detailed cost estimate for each alternative is provided in Tables 6-2 and 6-3.

Table 6-1
Supplemental Water Project Cost Estimate

	Highway 89 Corridor	
1	Well Construction	$1,588,000
2	20 Inch Transmission	$14,483,000
3	Booster Pump Station	$1,288,000
4	Terminal Tank	$1,812,000
5	EIR/Permitting/Preliminary Design	$1,000,000
6	Administrative/Legal (10%)	$1,917,000
7	Engineering Design (8%)	$1,533,600
8	Construction Management (10%)	$1,917,000
9	Construction Contingency (10%)	$1,917,000
	Total	**$27,500,000**

	USFS 06 Road Corridor	
1	Well Construction	$1,588,000
2	20 Inch Transmission	$18,639,000
3	Booster Pump Station	$1,378,000
4	Terminal Tank	$1,812,000
5	EIR/Permitting/Preliminary Design	$1,000,000
6	Administrative/Legal (10%)	$2,341,700
7	Engineering Design (8%)	$1,873,360
8	Construction Management (10%)	$2,341,700
9	Construction Contingency (10%)	$2,341,700
	Total	**$33,000,000**

6.2.2 COST ESTIMATING ASSUMPTIONS

As discussed previously there are four different facilities that need to be constructed for the Supplemental Water Supply Project. They include the well, transmission main, booster pump station, and terminal tank. The cost estimates for each of these facilities were developed using various methods. First, ECO:LOGIC has performed the engineering design for several similar facilities over the past few years. This first hand knowledge provides unique insight into the current costs for construction of these types of facilities. In addition, ECO:LOGIC analyzed cost estimates of similar projects that have been constructed in the past 12 months within the Tahoe Basin as well as similar projects in Northern Nevada and California. Finally, ECO:LOGIC contacted several manufactures and general contractors about several of the components needed to build these facilities. These meetings and discussions were used to adjust the final cost estimate numbers as seen below.

Tables 6-2 and 6-3 provide the detailed planning level cost estimates for the Highway 89 and the USFS alternatives, respectively. Below is a discussion about each of these facilities.

Well

For planning purposes, a new 2,000 gallon per minute well is proposed. This would provide the District with water to meet the maximum day demand estimated for buildout in the Valley. The well would be gravel packed, constructed with appropriate sanitary seal, and would be equipped with a water lubricated vertical turbine pump. ECO:LOGIC estimates that this new well construction would cost approximately $1.5 million dollars.

The well does not readily lend itself to being phased. A potential phasing option would include constructing one well to meet the initial water demands, followed by a second well as demands required. This would require the District to secure land for two water supply wells in the same vicinity. The cost to do so would likely approach over $1 million dollars per well.

Transmission Main

Highway 89 Alternative

The Highway 89 Corridor presents many challenges. First, a transmission line would encroach into the Caltrans right-of-way for about 8.5 miles along Highway 89 from Truckee to Squaw Valley. Even though most of the transmission line would be constructed in the shoulder of Highway 89, there would be costly paving and resurfacing needed to rehabilitate the shoulder to bring it back into compliance with the Caltrans specifications. In addition, costly traffic control would be required during the entire installation of the transmission line along Highway 89. Also, there are approximately 12-15 culverts that run along Highway 89 that would require either open cut or jack and bore pipeline construction methods.

USFS Alternative

The USFS corridor alternative includes piping from the well site up Schaeffer Mill Road to the PCWA tanks (approximately 2 miles) and piping along the NFS 06 Road to Squaw Valley

(approximately 14.5 miles). Also, a crossing of the Truckee River will be necessary at some point along the alignment to get to the terminal tank in Squaw Valley. This alternative has less cost associated with pavement restoration and traffic control. One concern is the rock excavation that will be needed as the alignment runs NFS 06 Road. Currently, ECO:LOGIC has assumed rock excavation would need to occur for about 25% of the proposed route through this corridor. In addition, ECO:LOGIC anticipates a significant re-vegetation and Best Management Practices effort for this corridor.

Booster Pump Station

The booster pump station would supply water from the connection points within the PCWA or TDPUD systems to the terminal water storage tank in Squaw Valley. The facility would have an ultimate capacity of 2,000 gpm. The difference in cost between the two facilities is due to the difference in pumping head.

The Highway 89 option would take water off of the TDPUD system at a maximum hydraulic grade line (HGL) of 6,170 feet. The terminal tank HGL in Squaw Valley will be 6,460 feet (Zone 1). The pumping head for this alternative would require approximately 150 horsepower. The USFS alternative would draw water from PCWA tanks at an elevation of approximately 6,300 feet. This alignment would have a high point at near 7,200 feet elevation. The pumping head required for this option indicated a pump size of approximately 500 horsepower.

With either alternative, the booster pump station would be enclosed in a 800 sq-ft (minimum) masonry block building. The pump station would house the required electrical/control equipment, necessary vertical turbine pumps, and the appropriate chemical storage facilities. The estimated cost is approximately $1 million dollars for the Highway 89 option and over $1.4 million dollars for the USFS alternative.

The booster pump station does lend itself to construction phasing. Initially, the size of the building and mechanical layout will allow for the full 2,000 gpm flow. But, pumps can be installed in phases so as to provide 500-1000 gpm per each phase. The cost reduction using this method would be seen in the purchase and installation of the vertical turbine pumps.

Terminal Tank

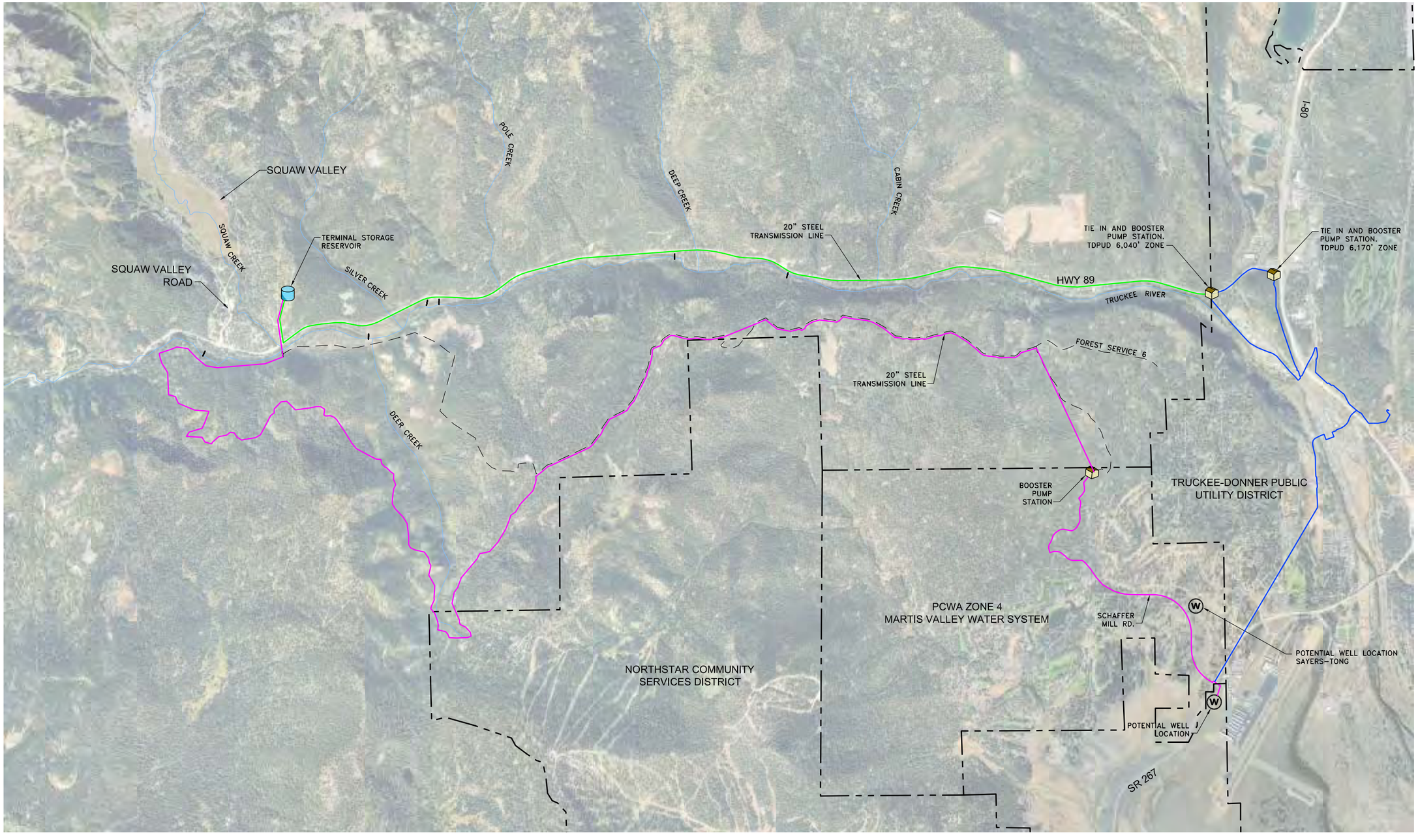
A two million gallon terminal tank located at the southern end of the water transmission main would be required for receiving the water supply. The tank would be located in the District's Zone 1 somewhere north of Squaw Creek and the Painted Rock subdivision. The recommended tank size is based on the following criteria:

- The District's current water storage capacity is 1,780,000 gallons
- The District's buildout maximum day demand (MDD) is 2,525 gpm
- The District's well capacity in the Olympic Valley is 1,315 gpm, with an additional 2,000 gpm provided from the Martis Valley

- The District must meet their MDD with the largest well out of service (the new 2,000 gpm well)
- The difference between the buildout MDD and the District's MDD supply will be 1,210 gpm (2,525 gpm MDD – 1,315 gpm supply with largest well out of service). This amounts to a daily storage volume of 1.75 million gallons
- Additional operating and emergency storage, along with fire flow storage would be necessary, amounting to approximately 2.25 million gallons
- Therefore, the total water storage capacity required at buildout includes 1.75 MG + 2.25 MG = 4 MG

Based on this analysis, an additional 2 million gallons of water storage would be necessary to meet buildout demands.

Distribution system piping to connect the tank to the existing water distribution system would also be required. The three largest expenditures for the terminal tank are site piping, site work, and tank erection. The total cost of the tank is approximately $1.8 million dollars.



LEGEND

- WATER PURVEYOR BOUNDARY
- FOREST SERVICE ROAD 6
- HWY 89 ALIGNMENT
- U.S. FOREST SERVICE CORRIDOR ALTERNATIVE
- TDPUD EXISTING PIPELINES
- TERMINAL STORAGE RESERVOIR
- BOOSTER PUMP STATION
- (W) POTENTIAL WELL LOCATIONS

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SQUAW VALLEY PUBLIC SERVICE DISTRICT

ALTERNATIVE/SUPPLEMENTAL WATER SUPPLY AND ENHANCED UTILITIES FEASIBILITY STUDY

SHEET TITLE:
FACILITIES COST ESTIMATE ALTERNATIVES

JOB #	SQAW07-007
DATE	AUGUST 2009
SCALE	AS SHOWN
DESIGNED	KDA
DRAWN	RJG
CHECKED	DTH

FIGURE NUMBER
6-1

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Table 6-2 - Planning Level Cost Estimate Highway 89 Corridor

Item No.	Description	Qty.	Unit	Unit Cost	Cost	
	CONSTRUCTION COSTS FOR WELL CONSTRUCTION					
1.0	**Mobilization/Demobilization**					
1.1	Mobilization/Demobilization	1	L.S.	$75,000	$75,000	
2.0	**Capital Cost**					
2.1	12-Inch Diameter Pilot Hole	750	L.F.	$100	$75,000	
2.2	Bore Hole Geophysical Log	1	L.S.	$3,000	$3,000	
2.3	36-Inch Diameter Bore Hole	100	L.F.	$300	$30,000	
2.4	30-Inch Diameter Blank Casing (Conductor HSLA)	105	L.F.	$140	$14,700	
2.5	26-Inch Diameter Bore Hole (Ream)	650	L.F.	$60	$39,000	
2.6	18-Inch Diameter Well Casing (Stainless)	402	L.F.	$460	$184,920	
2.7	18-Inch Diameter Well Screen (Stainless, wire-wrapped)	350	L.F.	$400	$140,000	
2.8	2 inch stainless steel sounding tube	1	L.S.	$16,500	$16,500	
2.9	Filter Pack	50	C.Y.	$500	$25,000	
2.10	Sanitary Seal	20	C.Y.	$400	$8,000	
2.11	Well Development	1	L.S.	$35,000	$35,000	
2.12	Testing Mobilization & Demobilization	1	L.S.	$2,500	$2,500	
2.13	Install/Remove Test Pump	550	L.F.	$20	$11,000	
2.14	Test Pumping	50	Hrs	$400	$20,000	
2.15	Well Site work	1	L.S.	$38,000	$38,000	
2.16	Well Exterior Piping	1	L.S.	$77,000	$77,000	
2.17	Well Vertical Turbine Pump	1	L.S.	$87,000	$87,000	
2.18	Well Mechanical	1	L.S.	$103,000	$103,000	
2.19	Well HVAC	1	L.S.	$19,000	$19,000	
2.20	Well Electrical	1	L.S.	$344,000	$344,000	
2.21	Well Scada	1	L.S.	$40,000	$40,000	
2.22	Masonry Well Building	500	S.F.	$300	$150,000	
2.23	Site BMP's/Environmental	1	L.S.	$50,000	$50,000	
	Total Construction Cost of Collection System					**$ 1,588,000**
	CONSTRUCTION COSTS FOR TRANSMISSION LINE					
1.0	**Mobilization/Demobilization**					
1.1	Mobilization/Demobilization	1	L.S.	$677,500	$677,500	
2.0	**Capital Cost**					
2.1	20-inch Tie-in to existing TDPUD's system	1	L.S.	$30,000	$30,000	
2.2	20-inch Steel Transmission Main from Well House to Existing System	1,500	L.F.	$150	$225,000	
2.3	20-inch Steel Transmission Main (HWY 89 Corridor)	45,000	L.F.	$200	$9,000,000	
2.4	HWY 89 Culvert Crossing (Open Cut)	1,000	L.F.	$300	$300,000	
2.5	HWY 89 Culvert Crossing (Jack and Bore)	1,000	L.F.	$1,000	$1,000,000	
2.6	Paving and Resurfacing	200,000	S.F.	$7.50	$1,500,000	
2.7	Traffic Control	1	L.S.	$1,250,000	$1,250,000	
2.8	Testing and Disinfection	1	L.S.	$100,000	$100,000	
2.9	Stormwater Pollution Prevention Plan (SWPPP) / BMP's	1	L.S.	$250,000	$250,000	
2.10	Revegatation/Landscape	1	L.S.	$150,000	$150,000	
	Total Construction Cost of the Transmission Line					**$ 14,483,000**
	CONSTRUCTION COSTS FOR BOOSTER PUMP STATION					
1.0	**Mobilization/Demobilization**					
1.1	Mobilization/Demobilization	1	L.S.	$61,350	$61,350	
2.0	**Capital Cost**					
2.1	Temporary Erosion Controls and Tree Protection	1	L.S.	$50,000	$50,000	
2.2	Pump Station Site Work	1	L.S.	$50,000	$50,000	
2.3	Pump Station Building	2,000	SF	$125	$250,000	
2.4	Vertical Turbine Suction Cans	3	EA	$30,000	$90,000	
2.5	Vertical Turbine Pumps	3	EA	$50,000	$150,000	
2.6	Pump Station Mechanical	1	L.S.	$175,000	$175,000	
2.7	Chlorination Equipment	1	L.S.	$30,000	$30,000	
2.8	HVAC Equipment	1	L.S.	$25,000	$25,000	
2.9	Pump Station Electrical Work	1	L.S.	$200,000	$200,000	
2.10	Primary Power Infrastructure	1	L.S.	$50,000	$50,000	
2.11	Pump Station Instrumentation and Controls Work	1	L.S.	$125,000	$125,000	
2.12	Fire Sprinker System	1	L.S.	$20,000	$20,000	
2.13	Disinfection and Testing	1	L.S.	$12,000	$12,000	
	Total Construction Cost for the Booster Pump Station					**$ 1,288,000**
	CONSTRUCTION COSTS FOR TWO MILLON GALLON TERMINAL TANK					
1.0	**Mobilization/Demobilization**					
1.1	Mobilization/Demobilization	1	L.S.	$81,500	$81,500	
2.0	**Capital Cost**					
2.1	Terminal Storage Tank Site Work	1	L.S.	$250,000	$250,000	
2.2	Terminal Storage Tank Site Piping	1	L.S.	$400,000	$400,000	
2.3	Terminal Storage Tank Erection	1	L.S.	$600,000	$600,000	
2.4	Terminal Storage Tank Interior Painting	1	L.S.	$125,000	$125,000	
2.5	Terminal Storage Tank Exterior Painting	1	L.S.	$60,000	$60,000	
2.6	Terminal Storage Tank Telemetry, Control and Install	1	L.S.	$70,000	$70,000	
2.7	Landscaping and Revegetation	1	L.S.	$50,000	$50,000	
2.8	Cathodic Protection Equipment	1	L.S.	$75,000	$75,000	
2.9	Site BMP's/Environmental	1	L.S.	$100,000	$100,000	
	Total Construction Cost for the Terminal Tank					**$ 1,812,000**
	Construction Total					**$ 19,170,000**
2.0	**Other Costs**					
2.1	EIR/Preliminary Design	1	L.S.	$1,000,000	$1,000,000	
2.2	Administrative and legal expenses (10%)	1	L.S.	$1,917,000	$1,917,000	
2.3	Engineering Design (8%)	1	L.S.	$1,533,600	$1,533,600	
2.4	Construction Management (10%)	1	L.S.	$1,917,000	$1,917,000	
2.5	Construction Contingency (10%)	1	L.S.	$1,917,000	$1,917,000	
	Other Costs Total					**$ 8,280,000**
	TOTAL PROJECT COSTS					**$ 27,500,000**

Table 6-3 - Planning Level Cost Estimate USFS Corridor

Item No.	Description	Qty.	Unit	Unit Cost	Cost	
	CONSTRUCTION COSTS FOR WELL CONSTRUCTION					
1.0	**Mobilization/Demobilization**					
1.1	Mobilization/Demobilization	1	L.S.	$75,000	$75,000	
2.0	**Capital Cost**					
2.1	12-Inch Diameter Pilot Hole	750	L.F.	$100	$75,000	
2.2	Bore Hole Geophysical Log	1	L.S.	$3,000	$3,000	
2.3	36-Inch Diameter Bore Hole	100	L.F.	$300	$30,000	
2.4	30-Inch Diameter Blank Casing (Conductor HSLA)	105	L.F.	$140	$14,700	
2.5	26-Inch Diameter Bore Hole (Ream)	650	L.F.	$60	$39,000	
2.6	18-Inch Diameter Well Casing (Stainless)	402	L.F.	$460	$184,920	
2.7	18-Inch Diameter Well Screen (Stainless, wire-wrapped)	350	L.F.	$400	$140,000	
2.8	2 inch stainless steel sounding tube	1	L.S.	$16,500	$16,500	
2.9	Filter Pack	50	C.Y.	$500	$25,000	
2.10	Sanitary Seal	20	C.Y.	$400	$8,000	
2.11	Well Development	1	L.S.	$35,000	$35,000	
2.12	Testing Mobilization & Demobilization	1	L.S.	$2,500	$2,500	
2.13	Install/Remove Test Pump	550	L.F.	$20	$11,000	
2.14	Test Pumping	50	Hrs	$400	$20,000	
2.15	Well Site work	1	L.S.	$38,000	$38,000	
2.16	Well Exterior Piping	1	L.S.	$77,000	$77,000	
2.17	Well Vertical Turbine Pump	1	L.S.	$87,000	$87,000	
2.18	Well Mechanical	1	L.S.	$103,000	$103,000	
2.19	Well HVAC	1	L.S.	$19,000	$19,000	
2.20	Well Electrical	1	L.S.	$344,000	$344,000	
2.21	Well Scada	1	L.S.	$40,000	$40,000	
2.22	Masonry Well Building	500	S.F.	$300	$150,000	
2.23	Site BMP's/Environmental	1	L.S.	$50,000	$50,000	
	Total Construction Cost of Collection System					**$ 1,588,000**
	CONSTRUCTION COSTS FOR TRANSMISSION LINE					
1.0	**Mobilization/Demobilization**					
1.1	Mobilization/Demobilization	1	L.S.	$887,550	$887,550	
2.0	**Capital Cost**					
2.1	20-inch Steel Transmission Main (Well to Pump Station)	10,100	L.F.	$150	$1,515,000	
2.2	20-inch Steel Transmission Main (Pump Station to Squaw Valley)	71,280	L.F.	$200	$14,256,000	
2.3	Rock Excavation	4,000	C.Y.	$250	$1,000,000	
2.4	Traffic Control (Schaffer Mill Rd. & CalTrans crossing)	1	L.S.	$75,000	$75,000	
2.5	Paving and Resurfacing	40,000	S.F.	$6.00	$240,000	
2.6	Testing and Disinfection	1	L.S.	$100,000	$100,000	
2.7	Stormwater Pollution Prevention Plan (SWPPP)	1	L.S.	$315,000	$315,000	
2.8	Revegatation/Landscape	1	L.S.	$250,000	$250,000	
	Total Construction Cost of the Transmission Line					**$ 18,639,000**
	CONSTRUCTION COSTS FOR BOOSTER PUMP STATION					
1.0	**Mobilization/Demobilization**					
1.1	Mobilization/Demobilization	1	L.S.	$65,600	$65,600	
2.0	**Capital Cost**					
2.1	Temporary Erosion Controls and Tree Protection	1	L.S.	$50,000	$50,000	
2.2	Pump Station Site Work	1	L.S.	$50,000	$50,000	
2.3	Pump Station Building	2,000	SF	$125	$250,000	
2.4	Vertical Turbine Suction Cans	3	EA	$30,000	$90,000	
2.5	Vertical Turbine Pumps	3	EA	$50,000	$150,000	
2.6	Pump Station Mechanical	1	L.S.	$225,000	$225,000	
2.7	Chlorination Equipment	1	L.S.	$15,000	$15,000	
2.8	HVAC Equipment	1	L.S.	$50,000	$50,000	
2.9	Pump Station Electrical Work	1	L.S.	$200,000	$200,000	
2.1	Primary Power Infrastructure	1	L.S.	$75,000	$75,000	
2.1	Pump Station Instrumentation and Controls Work	1	L.S.	$125,000	$125,000	
2.1	Fire Sprinker System	1	L.S.	$20,000	$20,000	
2.1	Disinfection and Testing	1	L.S.	$12,000	$12,000	
	Total Construction Cost for the Booster Pump Station					**$ 1,378,000**
	CONSTRUCTION COSTS FOR TWO MILLON GALLON TERMINAL TANK					
1.0	**Mobilization/Demobilization**					
1.1	Mobilization/Demobilization	1	L.S.	$81,500	$81,500	
2.0	**Capital Cost**					
2.1	Terminal Storage Tank Site Work	1	L.S.	$250,000	$250,000	
2.2	Terminal Storage Tank Site Piping	1	L.S.	$400,000	$400,000	
2.3	Terminal Storage Tank Erection	1	L.S.	$600,000	$600,000	
2.4	Terminal Storage Tank Interior Painting	1	L.S.	$125,000	$125,000	
2.5	Terminal Storage Tank Exterior Painting	1	L.S.	$60,000	$60,000	
2.6	Terminal Storage Tank Telemetry, Control and Inst.	1	L.S.	$70,000	$70,000	
2.7	Landscaping and Revegetation	1	L.S.	$50,000	$50,000	
2.8	Cathodic Protection Equipment	1	L.S.	$75,000	$75,000	
2.9	Site BMP's/Environmental	1	L.S.	$100,000	$100,000	
	Total Construction Cost for the Terminal Tank					**$ 1,812,000**
	Construction Total					**$ 23,417,000**
2.0	**Other Costs**					
2.1	EIR/Preliminary Design	1	L.S.	$1,000,000	$1,000,000	
2.2	Administrative and legal expenses (10%)	1	L.S.	$2,341,700	$2,341,700	
2.3	Engineering Design (8%)	1	L.S.	$1,873,360	$1,873,360	
2.4	Construction Management (10%)	1	L.S.	$2,341,700	$2,341,700	
2.5	Construction Contingency (10%)	1	L.S.	$2,341,700	$2,341,700	
	Other Costs Total					**$ 9,898,460**
	TOTAL PROJECT COSTS					**$ 33,000,000**