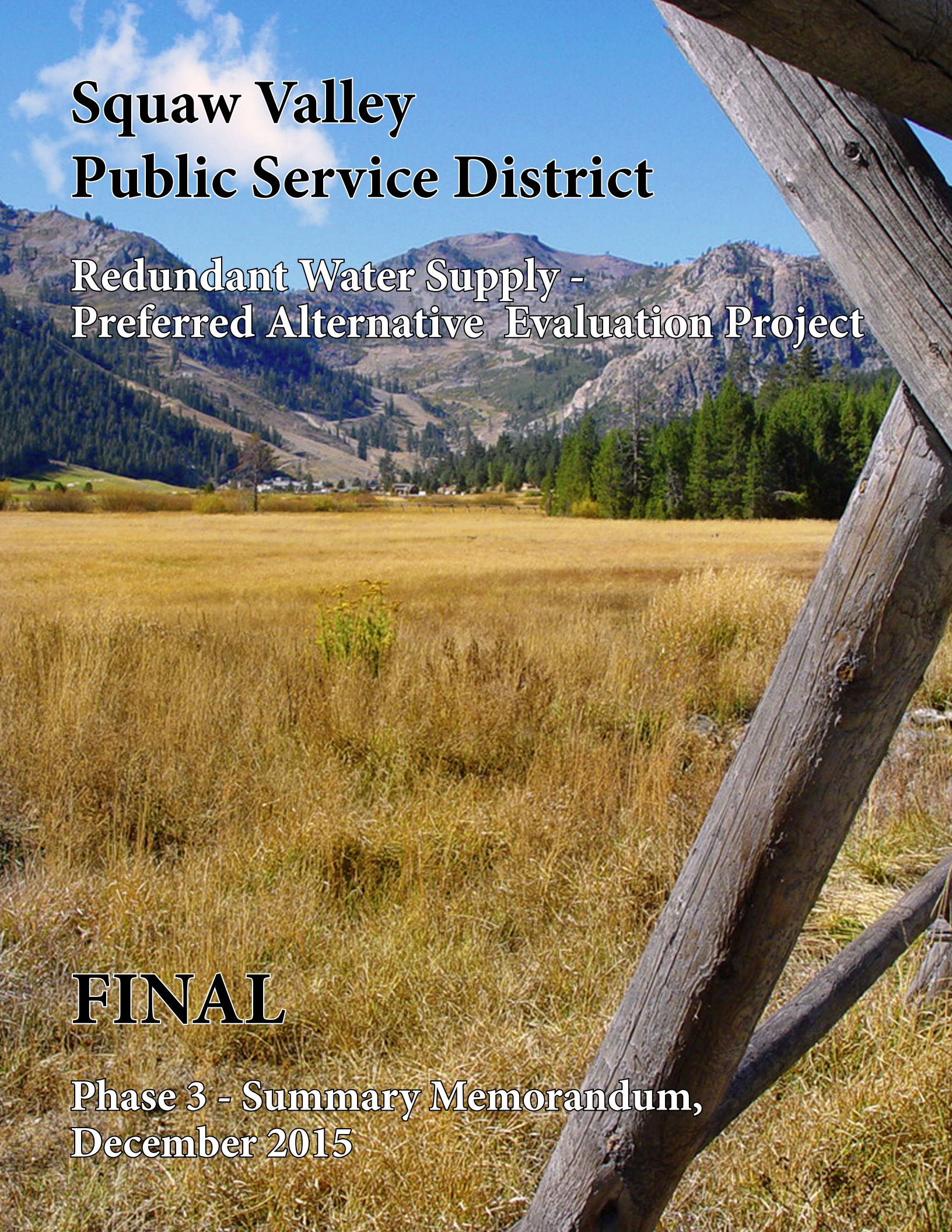


Squaw Valley Public Service District

Redundant Water Supply - Preferred Alternative Evaluation Project

FINAL

Phase 3 - Summary Memorandum, December 2015

Squaw Valley Public Service District

Redundant Water Supply – Preferred Alternative Evaluation Project

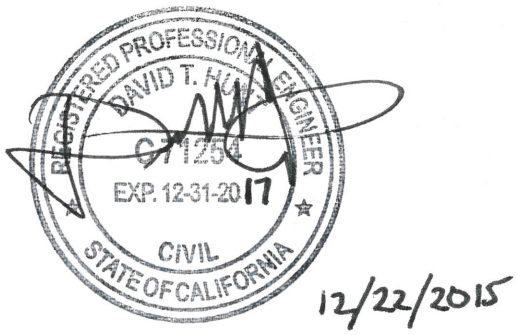
Phase 3 – Summary Memorandum

December 2015

Prepared by:

FARR WEST

ENGINEERING



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EXECUTIVE SUMMARY

SQUAW VALLEY PUBLIC SERVICE DISTRICT

REDUNDANT WATER SUPPLY – PREFERRED ALTERNATIVE EVALUATION PROJECT PHASE 3 – SUMMARY MEMORANDUM

Prepared For: Mike Geary, P.E., General Manager

Prepared By: David Hunt, P.E.

Review By: Matt Van Dyne, P.E.

Date: December 21, 2015

Subject: **Executive Summary**

ES.1 PURPOSE

The Summary Memorandum is the final component of the Squaw Valley Public Service District's (District) Redundant Water Supply – Preferred Alternative Evaluation Project (Project). The Summary Memorandum is made up of three technical memorandums (TMs). These TMs evaluate feasible water supply and transmission alternatives, develop preferred alternatives, and relay a project description to support the future preliminary design and environmental permitting tasks. The TMs include:

- TM No. 1 - Evaluation Criteria and Alternatives Evaluation Approach
- TM No. 2 - Alternatives Evaluation
- TM No. 3 - Project Description

The purpose of TM No. 1 is twofold; define the evaluation approach by which to compare project alternatives, and identify and describe the criteria that will be used to evaluate, rank, and select the preferred water source, transmission, pumping, and storage combination. The TM defines a comprehensive list of evaluation criteria developed by the project team, as well as preliminary weighting of each set of criteria and subcriteria.

The purpose of TM No. 2 is to present the results of the water supply, transmission, storage, and pumping alternatives evaluation and ultimately identify preferred project alternatives. The

selected project alternatives were determined based on a series of criteria and metrics used to rank the alternatives.

The purpose of TM No. 3 is to provide a project description that can be used for project planning, public outreach, and set a foundation for the specific project descriptions required for environmental documents and permits. The project description is written to be easily inserted into a CEQA, NEPA, or environmental permit application project description, as well as provide the District and the Board with a clear vision of the continued development of the project. The project description also aims to define the anticipated environmental permitting requirements, timelines and costs, and identify the "next steps" for the project leading into permitting and design.

ES.2 TM NO. 1 – EVALUATION CRITERIA AND ALTERNATIVES EVALUATION APPROACH

The Redundant Water Supply – Preferred Alternative Evaluation Project Phase 3 Feasibility Study Update (November 2015) identified potential transmission main corridors, water source locations, booster pump station locations, and terminal water storage tank locations. The alternatives evaluation occurred in two stages, with the level of detail increasing in each subsequent stage. The stages included:

- Preliminary Corridor Evaluation, and
- Detailed Alternatives Evaluation.

The purpose of the preliminary transmission main alignment evaluation was to evaluate the transmission main alignment alternatives and identify any undesirable routes based on constructability issues. The Feasibility Study Update showed that environmental impacts and permitting, USFS, and Caltrans right of way requirements did not indicate any fatal flaws for any of the alignment alternatives. Constructability issues could have a significant impact on the project cost as well as future operation and maintenance. To the extent possible, standard open cut trenching is desirable; however, special construction methods will be required for certain sections of all identified transmission main alternatives. This includes bridge crossings and jack and bore construction for creek and culvert crossings. Other constructability constraints include geotechnical constraints and rock excavation, topography and slope, construction equipment access, length of pipeline, linear alignment, operation and maintenance constraints, and cost. Identified alternative alignments within the USFS 06 corridor were found to have major constructability constraints based on the criteria presented above. Because of this, the USFS 06 Road and Liberty Energy Pole Line alignment alternatives were not considered for further, detailed evaluation.

The detailed evaluation of project alternatives included both non-economic and economic components. The project alternatives were evaluated using a matrix comparison, which allowed for an unbiased selection of the preferred alternatives relative to competing alternatives based on direct comparison. The matrix evaluation included development of criteria, subcriteria, and evaluation metrics developed by the project team.

ES.3 TM NO. 2 – ALTERNATIVES EVALUATION

Using the matrix evaluation approach described in TM #1, the project team performed a detailed non-economic and economic evaluation of the project alternatives. Table ES-1 through Table ES-3 provide a summary of the non-economic matrix evaluation results as well as the planning level cost estimates for each project component and alternative. Project alternatives are shown in Figures 1-3 in TM #2.

Table ES-1 – Transmission Main Evaluation Results

Alternative	Rank	Score	Cost Estimate ($M)
Hwy 89 West Shoulder	1	92.1	$13.7
Hwy 89 East Shoulder	2	89.9	$13.6
Placer County Bike Path	3	63.2	$16.3
TTSA TRI	4	57.8	$13.1

Table ES-2 – New Water Source Evaluation Results

Alternative	Rank	Score	Cost Estimate ($M)
Area A	1	91.7	$1.15
Zone 4	2	80.3	$1.15
Area B	3	76.2	$1.15
Area D	4	59.7	$1.15
Area C	5	57.6	$1.15

Table ES-3 – Water Storage Tank Evaluation Results

Alternative	Rank	Score	Cost Estimate ($M)
APN 096-290-051 (USFS Property)	1	94.1	$1.54
APN 096-230-041 (Poulsen Property)	2	79.7	$1.48

The detailed evaluation of the new water source location is based upon the assumption that the District will negotiate an intertie agreement with TDPUD and/or NCSD to secure additional available water supply from those regional water systems. This would occur prior to developing a new water source. If the District is unable to reach an agreement with TDPUD and/or NCSD, then the preferred new water source alternative would be Area A.

The preferred booster pump station location was not evaluated using the matrix evaluation because additional information is necessary to properly evaluate. The preferred location of the booster pump station will be located somewhere along the Highway 89 corridor with a connection to the TDPUD 6,170 foot pressure zone. To develop alternative sites, an understanding of the actual location of the transmission main (Caltrans ROW east or west shoulder) is necessary as well as a better understanding of the TDPUD water system hydraulics.

Table ES-4 provides the preferred project alternatives and planning level construction cost estimates based on the evaluation results.

Table ES-4 – Preferred Project Alternatives

Project Component	Alternative	Construction Cost Estimate ($M)
Transmission Main	Highway 89 Caltrans ROW (east or west shoulder)	$13.7
Water Source	Intertie agreement with TDPUD and/or NCSD	$0.0
Terminal Water Storage Tank	USFS Property (APN 096-290-051 (USFS Property)	$1.48
Booster Pump Station	Connection to TDPUD 6,170 foot zone	$1.1

ES.4 TM NO. 3 – PROJECT DESCRIPTION

The Project Description was written to support moving forward with the preliminary design process and environmental permitting tasks. It includes the necessary written descriptions to specifically support the CEQA/NEPA permitting processes. It is written in terms of the preferred project as identified in TM #2, but also provides a thorough presentation of project alternatives. This included alternatives to the proposed project, as well as alternatives within the proposed project.

Alternatives to the proposed project include those that were originally considered, but dismissed as infeasible as presented in the Phase 1 – Water Supply Feasibility Summary and Gap Analysis (November 6, 2014), Phase 2 – Evaluation of Water Supply Source(s) Identified in Gap Analysis (February 24, 2015) and Phase 3 Feasibility Study Update (November 10, 2015).

The Project Description also identified probable key environmental permits for the proposed Project as well as project next steps. These permits and their estimated timelines are shown in Table ES-5. The initial next step for the proposed Project is to begin a dialogue with the TDPUD and/or NCSD regarding water supply. The preferred water source for the proposed Project is an intertie agreement with TDPUD and/or NCSD. If an intertie agreement with these agencies cannot be executed, then the District would have to pursue a new water source as identified in TM #2. Following completion of the potential intertie agreement, the Project can move forward with Preliminary Design and Environmental Permitting. Preliminary Design activities will bring the Project forward to the 30 percent design level to support the Environmental Permitting documents. Table ES-6 below provides a list of tasks associated with the Preliminary Design and Environmental Permitting activities. The timing and costs of these activities will be scoped out in more detail as Project financing becomes available.

Table ES-5 – Permits and Timelines

Permit Name	Agency	Trigger	Estimated Timeline*
CEQA Compliance	SVPSD (Lead Agency)	Discretionary Action by the District	12-18 months
NEPA Compliance	USFS	Special Use Permit from USFS	12-16 months
CWA 401 Certification (and Board - Resolution No. 6-93-08)	RWQCB Lahontan	Surface Waters of the US (Lahontan RWQCB)	4-5 months
Wetland Delineation Verification	RWQCB Lahontan	Waters of U.S. (ordinary high water mark) and wetlands	6-8 months
CWA 404 Permit	USACE	Waters of US wetlands/vernal pools (ordinary high water mark)	12-18 months
USFWS ESA Section 7 Consultations	USFWS	Potential for "take" of Federally listed habitat or Individuals	9-12 months (assuming formal consultations)
SHPO NHPA Section 106 Consultations	SHPO	Cultural Resources	2-3 months
Fish and Game Code 1602 Permits	CDFW	Impacts to Bed/Bank and floodplain	4-5 months
Placer County Tree Permit**	Placer County	Removal of trees 6-inch dbh or greater	1-2 months
Encroachment Permits (Caltrans and local agency**)	Caltrans	Placement of pipeline within Caltrans or County Easements	2-6 months
Grading Permit** and Stormwater Pollution Prevention Plan (SWPPP)	SWRCB	County grading permit and State SWPPP for grading areas > 1-acre	2-6 months

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

** Special District Water Utilities may be exempt.

Table ES-6 – Preliminary Design and Environmental Permitting Tasks

Preliminary Design Activities	
Transmission Main	**Booster Pump Station**
• Field survey of the Highway 89 corridor • Geotechnical investigation • Preliminary alignment layout	• Hydraulic evaluation of TDPUD system • Hydraulic evaluation of transmission main between Truckee and Squaw Valley • Establish required elevation of booster pump station • Evaluate available land • Negotiate easement(s) with landowners • Survey and geotechnical investigation of selected site • 30% level design of site, building, and piping
Terminal Water Storage Tank	**New Water Source (if required)**
• Negotiate access road easement • Survey and geotechnical investigation • 30% level design of site, tank, access road, and piping	• Hydrogeologic investigation of preferred well site(s) • Negotiate easements with land owners • Exploratory drilling program and permitting
Environmental Permitting Activities	
• CEQA Documentation (Lead Agency to determine appropriate level of CEQA analysis through an Initial Study) • NEPA Documentation (water storage tank)(District to work with potential federal NEPA Lead Agencies to define NEPA Lead Agency and appropriate NEPA process) • Initiate the permit processes presented in Table ES-5 above	• Cultural resource records search through the California Historic Resources Information System (CHRIS) North Central Information Center (NCIC) • Cultural resource records search at the USFS (only applicable where Project components are located on USFS land) • AB52 and National Historic Preservation Act (NHPA) Section 106 compliant Native American Consultations • Obtain USFS Special Use Permit to complete cultural resource survey on any USFS land • Cultural Resource Survey

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TECHNICAL MEMORANDUM

SQUAW VALLEY PUBLIC SERVICE DISTRICT

REDUNDANT WATER SUPPLY – PREFERRED ALTERNATIVE EVALUATION PROJECT PHASE 3 – PREFERRED ALTERNATIVE EVALUATION

Prepared For: Mike Geary, P.E., General Manager

Prepared By: David Hunt, P.E.
Lucas Tipton, P.E.
Kimberly Clyma, J.D. (Stantec)
Jack Childress, P.G. (Interflow Hydrology)

Reviewed By: David Hunt, P.E.

Date: October 19, 2015

Subject: **Technical Memorandum No. 1 – Evaluation Criteria and Alternatives Evaluation Approach**

1.0 PURPOSE

The purpose of this Technical Memorandum (TM) is twofold:

1. Define the evaluation approach by which to compare project alternatives; and

2. Identify and describe the criteria that will be used to evaluate, rank, and select the preferred water source, transmission, pumping, and storage combination.

The TM defines a comprehensive list of evaluation criteria developed by the project team, as well as preliminary weighting of each set of criteria and subcriteria. These criteria and preliminary matrix weightings were presented to the Squaw Valley Public Service District (District) at a workshop on October 9, 2015. The workshop included an interactive discussion where District staff and the project team worked together to finalize the evaluation criteria and matrix weighting.

With acceptance by the District, the project team will move forward with evaluating and recommending a preferred project alternative(s) for the Redundant Water Supply Project (project).

2.0 INTRODUCTION

To address the need for a redundant water supply for the Olympic Valley, the District prepared the Alternative/Supplemental Water Supply and Enhanced Utilities Feasibility Study (Feasibility Study) in 2009 (ECO:LOGIC Engineering). The purpose of the study was to determine potential project "fatal flaws" and it investigated the feasibility of importing water supplies from outside District boundaries as a redundant water supply for the Valley's current and future water supply customers.

Farr West Engineering (Farr West) and the District recently completed an update to the Feasibility Study as part of the ongoing project. The primary goal of the project is to identify a redundant source of water supply for the Olympic Valley to allow for reliable quantity and quality that is geographically diverse from the aquifer currently used as the primary source of potable water, and to provide redundancy for improved emergency preparedness.

The scope of work for the project as a whole includes three distinct phases:

- Phase I – Water Supply Feasibility Summary and Gap Analysis.
- Phase II – Evaluation of Water Supply Source(s) Identified in Gap Analysis.
- Phase III – Preferred Alternative Evaluation.

The District recently completed Phase I – Water Supply Feasibility Summary and Gap Analysis (November 6, 2014) and Phase II – Evaluation of Water Supply Source(s) Identified in Gap Analysis (February 24, 2015).

This TM is part of Phase III of the project which includes the recently completed Feasibility Study Update as well as a thorough alternatives evaluation used to develop a project description and support moving forward with the CEQA/NEPA process, public outreach program, planning, permitting, and preliminary design of the water supply project. This TM includes the following sections:

- Corridor Evaluation and Alternatives Selection Approach,
- Preliminary Transmission Main Alignment Evaluation,
- Evaluation Approach, and
- Detailed Evaluation Criteria and Method.

3.0 CORRIDOR EVALUATION AND ALTERNATIVES SELECTION APPROACH

Potential transmission main corridors, water source locations, booster pump station, and terminal tank locations were developed in the Feasibility Study Update and are summarized in Table 1 - Table 3.

Table 1 - Transmission Main Corridors (Figure 4-1 from Feasibility Study Update)

Corridor	Alignment
Highway 89	
	Highway 89 West Shoulder
	Highway 89 East Shoulder
	Placer County Bike Path
	TTSA TRI Sewer Interceptor
	Combination of TRI/Bike Path/Highway 89
USFS 06	
	USFS 06 Road
	Liberty Energy Pole Line

Table 2 - Water Source Alternatives (Figure 3-2 from Feasibility Study Update)

Area	Location
Area A	Near Truckee Airport and Schaffer Mill Rd.
Area B	Vicinity of Donner Creek and Mouse Hole Highway 89
Area C	Southwest portion of MVGB (near Carson Range Tank)
Area D	Southwest portion of MVGB (near Olana Tank)
Zone 4	Within NCSD Zone Water System Boundary

Table 3 - Terminal Tank Alternatives (Figure 4-1 from Feasibility Study Update)

Area	Location
APN 096-230-041	Poulson Property North of Painted Rock
APN 096-290-051	USFS Property South of District Administration Building

It should be noted that the booster pump station required to move water from the Zone 4 or TDPUD systems to Squaw Valley will be evaluated after the source and transmission main preferred alternatives have been identified.

The alternatives evaluation will occur in two stages, with the level of detail increasing in each subsequent stage. The stages include:

- Preliminary Corridor Evaluation, and
- Detailed Alternatives Evaluation.

These stages are presented in more detail below.

4.0 PRELIMINARY TRANSMISSION MAIN ALIGNMENT EVALUATION

The purpose of the preliminary transmission main alignment evaluation is to evaluate the transmission main alignment alternatives and identify any undesirable routes based on constructability issues. The Feasibility Study Update showed that environmental impacts and

permitting, USFS and Caltrans right of way requirements did not indicate any fatal flaws for any of the alignment alternatives.

In the Feasibility Study Update, transmission main corridors were developed based on their ability to move water from the Martis Valley Groundwater Basin (MVGB) to Squaw Valley. Two alignment corridors were identified (Highway 89 and USFS 06), and five alternative alignments were developed within these corridors (Figure 4-1 Feasibility Study Update). The potential alignment alternatives were established based on the following considerations:

- Feasible water supply options which included independent District water supply and/or wheeling water through the NCSD, Zone 4, and/or TDPUD water systems;
- Field investigations of the corridors to assess the physical, engineering, operations and maintenance, and environmental characteristics of each alignment alternative;
- Formal meetings with the USFS and Caltrans regarding permitting and design criteria;
- Meetings with Placer County regarding their preferred bike path alignment along the Highway 89 corridor;
- Meeting with TTSA to discuss constraints and concerns regarding the TRI alignment; and
- Environmental constraints analysis to determine whether there were any major liabilities or fatal flaws that would render a corridor or alignment not permittable.

4.1 CONSTRUCTABILITY EVALUATION

Constructability issues could have a significant impact on the project cost as well as future operation and maintenance. To the extent possible, standard open cut trenching is desirable; however, special construction methods will be required for certain sections of all identified transmission main alternatives. This includes bridge crossings and jack and bore construction for creek and culvert crossings. Other constructability constraints include geotechnical constraints and rock excavation, topography and slope, construction equipment access, length of pipeline, linear alignment, operation and maintenance constraints, and cost.

Each of the identified alternative alignments share some or all of these constraints to some degree. However, the USFS 06 and Liberty Energy Pole Line alignments were found to have major constructability constraints. The USFS 06 alignment includes the longest pipeline (approximately 13 miles) as well as the highest construction cost (approximately $20 million, pipeline only). This alignment also traverses a very non-linear alignment with only one point of primary access for construction and maintenance (Sierra Meadows subdivision). The Pole Line alignment from the upper portion of the Zone 4 water system is a fairly linear corridor, but the major constraint for this alignment is the constructability within the major rock slide area near Big Chief. This area spans more than 1,600 linear feet through a boulder pile with slopes in excess of 75%. Access for maintenance to both of these pipeline alternatives is frequently limited by the USFS due to weather constraints. For these reasons, the alignments within the USFS 06 corridor will not be further evaluated in the detailed evaluation.

The alignments within the Highway 89 corridor do not exhibit any of the major constructability constraints.

5.0 EVALUATION APPROACH

The detailed evaluation of project alternatives will include both non-economic and economic components. The sections below include a description of the evaluation method as well as a presentation of the criteria and subcriteria that will be used to perform the detailed non-economic evaluation of water main alignments, water sources, and terminal tank locations.

The results from the non-economic evaluation will ultimately be paired with a cost based analysis that will identify the economic impacts of each alternative. The economic evaluation will provide a means to weigh the potential cost advantages or disadvantages associated with an alternative relative to its non-economic benefits. For example, if the second highest ranked alternative alignment is much less costly, it would be important to consider the possibility of potential savings when recommending the proposed alternative(s).

The detailed evaluation will initially include an evaluation of the transmission alignment and sources independently. The transmission main alignment does not necessarily dictate the source location, and vice versa. The ability to move water through the existing NCSD, Zone 4 and/or TDPUD systems provides the flexibility to provide source water from any of the potential source locations. We will bring the highest scoring source and transmission alternatives together after the independent non-economic and economic evaluations to create a preferred project. When the preferred source and transmission alternative(s) is identified, the required booster pumping alternatives will then be evaluated.

Evaluation of the terminal water storage tanks will also be performed independently of the source and transmission alternatives. The location of the terminal water storage tank in Squaw Valley does not bear on the selection of the source and transmission alterative(s).

5.1 NON-ECONOMIC EVALUATION METHOD

The pipeline, source, and storage alternatives will be evaluated using a matrix comparison. The matrix will be used as a tool to identify the best alternative relative to the competing alternatives based on direct comparison. This section includes a brief description of the methodology used for the comparison. Descriptions of the various criteria and the specific weighting assigned to each criterion are discussed in the sections below.

Each alternative under consideration is scored based on a number of criteria developed by the project team. The relative value assigned to each criterion determines its importance, or weight, compared to the other criteria used in the evaluation. Ultimately, a final score will be summed for each alternative based on the alternative's ranking and the weighting of the criterion. This final score represents the alternative's overall ranking relative to the other alternatives with a higher score being preferable to a lower one. The final score will be used in the selection of the recommended alternative(s).

Each set of criteria, subcriteria, and evaluation metrics will be assigned a weight based on the importance to the project as a whole, with a maximum of ten (10), representing critical importance,

and a minimum of zero (0), representing least importance. Table 4 presents the scale used in the weighting of criteria.

Table 4 – Criteria/Subcriteria Weighting Scale

Verbal Scale	Numeric Scale
Critical	10
Very Important	7.5
Important	5
Less Important	2.5
Least Important	0

The sections below describe in more detail the weighting of the primary evaluation criteria, subcriteria, and evaluation metrics.

6.0 DETAILED EVALUATION CRITERIA AND METHOD - PIPELINE

The detailed evaluation of the transmission pipeline is based upon the results of the preliminary evaluation process and the information available at the time of the evaluation. Therefore, based on the preliminary evaluation it is assumed that neither the USFS 06 alignment, nor the Pole Line alignments are considered viable alternatives and will not be evaluated any further.

6.1 PIPELINE EVALUATION METHOD

With careful consideration given to the goals and objectives of the project and the needs of District, the project team initially developed the evaluation criteria, subcriteria, and weighting convention assigned to each. The District was then solicited for review, input and acceptance of these parameters.

Five evaluation criteria were used to compare the pipeline corridor alternatives:

1. Operations and Maintenance
2. Engineering
3. Public/Regional Impacts
4. Environmental
5. Right-of-Way Requirements

Table 5 applies the weighting scale in Table 4 to each of the five evaluation criteria listed above. The "Priority" in Table 5 represents a normalization of the weighting, which reflects the relative contribution that a particular criterion has on the overall ranking relative to the other criteria. This priority is expressed as a percentage of the sum of all criterion weights. In this case there are five criteria categories that were weighted separately. These priorities reflect the total criteria scoring, equaling 100 percent.

Table 5 – Pipeline Criteria Weights and Priorities

Criteria	Weight	Priority
Operations and Maintenance	7.5	21.4%
Engineering	10	28.6%
Political and Public Impacts	5	14.3%
Environmental	7.5	21.4%
Right-of-Way Requirements	5	14.3%
Total	**35**	**100%**

The five main criteria listed above were broken down into a total of twenty-one (21) subcriteria, which are specific characteristics used to compare how well each alternative alignment meets each criterion. Each subcriterion was assigned a weight and a priority was calculated, similar to the five main criteria (as described above). Finally, a matrix weight was calculated for each subcriterion. The matrix weight represents the weight of which a particular subcriterion carries compared to all other subcriteria identified in the analysis. The subcriterion matrix weight is based on the product of the subcriterion priority and the criterion priority. The overall matrix weight for each criterion is equal to that criterion's priority. The matrix weight remains constant through the evaluation, unless criteria or subcriteria weighting is modified. Table 6 below summarizes the subcriteria weights, priorities, and matrix weights for the transmission main.

Finally, each subcriterion is defined by a series of evaluation metrics. These evaluation metrics are also given a weight and a calculated priority. The matrix weight of each metric is equal to the overall matrix weight of a subcriterion multiplied by the metrics priority. Criterion metrics are described in more detail below. A summary of criteria, subcriteria, and metric weights, priorities and matrix weights is provided in Table 7.

Ultimately, the last step in the evaluation will be to rank each of the alternative alignments against each subcriterion and calculate the resulting score. For example, there are five alternative alignments, and for each evaluation metric an alignment will be ranked relative to how well it compares on a range from one (1) to five (5), with five representing the highest rank. The score for a given metric is the rank divided by the number of alternatives and then multiplied by the metric matrix weight. These scores are then summed for all metrics to result in a subcriterion score. Subcriterion scores are summed for each alternative alignment to determine the highest scoring alternative. *Alternative scoring will be completed as part of TM No. 2 – Alternatives Evaluation.*

Table 6 – Pipeline Subcriteria Weights, Priorities, and Matrix Weights

Subcriteria	Weight	Priority	Matrix Weight
Operation & Maintenance Weight = 7.5, Priority = 21.4%			
Level of Operator Attention	5	18%	3.9
Accessibility	7.5	27%	5.9
Impacts from Repair and Maintenance	7.5	27%	5.9
Agency Coordination/Permitting	5	18%	3.9
Impacts from Natural Disaster	2.5	9%	1.9
Subtotal	27.5	100%	21.4
Engineering Weight = 10, Priority - 28.6%			
Constructability	10	31%	8.8
Geotechnical Constraints	7.5	23%	6.6
Accessibility	5	15%	4.4
Impacts to Existing Facilities	5	15%	4.4
Compliance with Drinking Water Regulations	2.5	8%	2.2
Flood Plain	2.5	8%	2.2
Subtotal	32.5	100%	28.6
Public/Regional Impacts Weight = 5, Priority = 14.3%			
Potential for Opposition	10	33%	4.8
Aesthetic Impacts	7.5	25%	3.6
Potential Regional Benefits	5	17%	2.4
Agency Cooperation/Dependence	7.5	25%	3.6
Subtotal	30	100%	14.3
Environmental Weight = 7.5, Priority = 21.4%			
Waters	10	33%	7.1
Biological Resources	10	33%	7.1
Cultural Resources	5	17%	3.6
Land Use	5	17%	3.6
Subtotal	30	100%	21.4
Right of Way Requirements Weight = 5, Priority = 14.3%			
Permanent Easements	10	80%	11.4
Temporary Construction Easements	2.5	20%	2.9
Subtotal	12.5	100%	14.3

TABLE 7 - NON ECONOMIC EVALUATION - TRANSMISSION MAIN

Criteria			Subcriteria			Subcriteria Metric			
Criteria	**Weight**	**Priority (%)**	**Subcriteria**	**Weight**	**Priority (%)**	**Metric**	**Weights**	**Priority (%)**	**Matrix Weight**
O & M	7.5	21.4%	**Level of Operator Attention**	5	18.2 %	Number of Appurtenances that require Maintenance and Repair	10	50%	1.9
						Pipeline Length	10	50%	1.9
						Sub-total	**20**	**100%**	**3.9**
			Accessibility	7.5	27.3 %	Remote Locations	10	44%	2.6
						Paved Road v. Dirt Road	7.5	33%	1.9
						Type of Vehicle Access: Snow Cat, ATV, Light Truck, etc.	5	22%	1.3
						Sub-total	**22.5**	**100%**	**5.8**
			Impacts from Repair and Maintenance	7.5	27.3 %	Traffic Control	10	36%	2.1
						Pedestrian/Public Impacts	7.5	27%	1.6
						AC Repair	7.5	27%	1.6
						Revegetation/BMP's	2.5	9%	0.5
						Sub-total	**27.5**	**100%**	**5.8**
			Agency Coordination/Permitting	5	18.2 %	Stream Crossings	7.5	43%	1.7
						Bridge Crossings	5	29%	1.1
						Impacts to Ex. Infrastructure	2.5	14%	0.6
						Interference with Other Utilities	2.5	14%	0.6
						Sub-total	**17.5**	**100%**	**3.9**
			Impacts from Natural Disaster	2.5	9.1 %	Flooding	5	29%	0.6
						Landslides	5	29%	0.6
						Stream Bank Erosion	5	29%	0.6
						Fire	2.5	14%	0.3
						Sub-total	**17.5**	**100%**	**1.9**
			Sub-total	**27.5**	**100.0 %**				**21.4**
Engineering	10	28.6%	**Constructability**	10	30.8 %	Standard v. Non-Standard Methods	10	24%	2.1
						Material Staging	10	24%	2.1
						Construction Vehicle Access	7.5	18%	1.6
						Jack and Bore	5	12%	1.0
						Bridge Crossings	5	12%	1.0
						Traffic Control	5	12%	1.0
						Sub-total	**42.5**	**100%**	**8.8**
			Geotechnical Constraints	7.5	23.1 %	# of Retaining Walls	10	33%	2.2
						Trench Integrity	7.5	25%	1.6
						Reuse of spoils for backfill	7.5	25%	1.6
						Rock Excavation	5	17%	1.1
						Sub-total	**30**	**100%**	**6.6**
			Accessibility	5	15.4 %	Bridge Reinforcement	5	40%	1.8
						Access Agreements	7.5	60%	2.6
						Sub-total	**12.5**	**100%**	**4.4**
			Impact to Existing Facilities	5	15.4 %	Negative effect on existing infrastructure during construction	2.5	100%	4.4
						Sub-total	**2.5**	**100%**	**4.4**
			Compliance with Drinking Water Regulations	2.5	7.7 %	Compliance with California State Waterworks Standards	2.5	100%	2.2
						Sub-total	**2.5**	**100%**	**2.2**
			Flood Plain	2.5	7.7 %	Location with respect to FEMA defined floodplain	5	100%	2.2
						Sub-total	**5**	**100%**	**2.2**
			Sub-total	**32.5**	**100.0 %**				**28.6**
Public/Regional Impacts	5	14.3%	**Potential for Opposition**	10	33.3 %	Consideration to traffic, noise, air quality impacts	10	25%	1.2
						Proximity to residences	10	25%	1.2
						Potential impacts to private property	10	25%	1.2
						Potential Impacts to commercial interests	10	25%	1.2
						Sub-total	**40**	**100%**	**4.8**
			Aesthetic Impacts	7.5	25.0 %	Short term construction impacts (grading, staging areas)	10	50%	1.8
						Long term impacts (change in topography, removal of vegetation, visibility of appurtenances)	10	50%	1.8
						Sub-total	**20**	**100%**	**3.6**
			Potential Regional Benefits	5	16.7 %	Fire Protection	10	57%	1.4
						Potable Drinking Water Source for Others	5	29%	0.7
						Utility corridor (fiber, cable, phone, etc.)	2.5	14%	0.3
						Sub-total	**17.5**	**100%**	**2.4**
			Agency Cooperation/Dependence	7.5	25.0 %	Reliance on neighboring agencies for water supply and use of existing infrastructure	7.5	43%	1.5
						Construction within or near existing utility corridors	5	29%	1.0
						Reliance on other public projects (Placer County Bike Path)	5	29%	1.0
						Sub-total	**17.5**	**100%**	**3.6**
			Sub-total	**30**	**100.0 %**				**14.3**
Environmental	7.5	21.4%	**Waters**	10	33.3 %	Waters of US	10	40%	2.9
						Waters of State	10	40%	2.9
						Stream Crossings	2.5	10%	0.7
						NPDES	2.5	10%	0.7
						Sub-total	**25**	**100%**	**7.1**
			Biological Resources	10	33.3 %	Listed Species	10	40%	2.9
						Critical Habitat	10	40%	2.9
						Species of Concern	2.5	10%	0.7
						Woodlands	2.5	10%	0.7
						Sub-total	**25**	**100%**	**7.1**
			Cultural Resources	5	16.7 %	Proximity to Water	10	33%	1.2
						Slopes	10	33%	1.2
						Known Resources	10	33%	1.2
						Sub-total	**30**	**100%**	**3.6**
			Land Use	5	16.7 %	USFS Lands	10	29%	1.0
						Private Property	7.5	21%	0.8
						Caltrans ROW	2.5	7%	0.3
						Sensitive Receptors	7.5	21%	0.8
						Traffic	2.5	7%	0.3
						Air Quality/Green House Gases	5	14%	0.5
						Sub-total	**35**	**100%**	**3.6**
			Sub-total	**30**	**100.0 %**				**21.4**
ROW Requirements	5	14.3%	**Permanent Easements**	10	80.0 %	Probability of Obtaining an Easement	10	33%	3.8
						Cost of Obtaining an Easement	10	33%	3.8
						% within Existing ROW/PUE Easement	5	17%	1.9
						Public or Private easement	5	17%	1.9
						Sub-total	**30**	**100%**	**11.4**
			Temporary Construction Easements	2.5	20.0 %	Ability to secure temporary construction easements	2.5	100%	2.9
						Sub-total	**2.5**	**100%**	**2.9**
			Sub-total	**12.5**	**100.0 %**				**14.3**
Total	**35**	**100%**							**Total**

Weight = value assigned to given criterion (or subcriterion) with respect to other criteria (or subcriteria).

Priority = the value of weights after normalization.

Matrix Weight = the metric priority multiplied by the criterion priority.

6.2 PIPELINE NON-ECONOMIC CRITERIA AND SUBCRITERIA

Table 7 summarizes the criteria, subcriteria, and evaluation metrics serving as the primary basis for selecting the proposed conveyance pipeline alignment for the project. Detailed descriptions and assigned weightings for the criteria and subcriteria are discussed in the sections below. The weight assigned to each of the criteria has significant bearing on the final score for each alternative. Weights reflect the judgment of the project team, with input provided by the District.

A. Operations & Maintenance

The operations and maintenance of transmission mains are a significant consideration in the overall project evaluation and preliminary design. Only certain operational subcriteria are pertinent to a comparative evaluation of alternative transmission main alignments and ultimately the selection of the most preferable alignment. For these reasons, this criterion gives a "Very Important" consideration to the operational advantages of any one alternative alignment over another. This criterion attempts to evaluate for each alternative the degree of maintenance, operation and how well the alignment accommodates long term accessibility for maintenance purposes.

Level of Operator Attention

Appurtenances installed along the transmission main will require regular inspection and maintenance. This subcriterion compares alternatives based upon the number of appurtenances installed and will have an "Important" consideration in the final operations and maintenance criterion score. Alternatives with more changes from positive to negative slopes will receive lower scores than corridors with fewer changes in slope. This subcriterion also evaluates the overall length of the alignment with the intention that a longer alignment will have a higher probability for repair than a shorter alignment. Assessments were based upon data and profiles drawn from planning level topographical data, and will potentially vary from actual design level profiles.

Accessibility

Pipelines and appurtenances require routine inspections and/or maintenance. Therefore, they should have long term accessibility, preferably via paved or well graded dirt roads. Access to the pipeline, especially at critical locations such as at the appurtenances, is weighted "Very Important" under the operations and maintenance criterion. This subcriterion evaluates the ability for maintenance crews to access the pipeline appurtenances and fittings for the purpose of long term maintenance. Alternative corridors that are located in remote areas, difficult to access by vehicle, and without existing roadways will receive lower scores than those that are easily accessible by vehicle, either within or near existing roads.

Impacts from Repair and Maintenance

Repair and maintenance activities often require large equipment and construction material staging in order to replace segments of failing infrastructure. This subcriterion evaluates the additional impacts which may be required during maintenance activities. Items such as traffic control, asphalt replacement, BMP's and public access will be estimated for each alternative. Those alternatives which necessitate additional considerations will be ranked lower than those which do not and will

have an "Important" consideration in an alternative's final operations and maintenance criterion score.

Agency Coordination/Permitting

With the length of the water main alignments covering over 8 miles between Truckee and Squaw Valley, numerous water features, roads and other utility line corridors will be crossed or shared by the proposed alignment. The District will need to coordinate maintenance and repair activities with any agency which owns adjacent infrastructure, and this subcriteria presumes that less coordination is favorable to more coordination. Alignments with the fewest crossings of the Truckee River, access bridges, pedestrian bridges, drainage culverts, sewer interceptors and power lines will rank higher than those which cross more infrastructure. This subcriterion shall have a "Less Important" influence on the final criterion score.

Impacts from Natural Disaster

Typically, open trench/direct bury construction provides an extremely secure environment for pipeline materials and the fluids which they transmit. However with the remoteness of the alignments, any potential for the transmission main to be damaged by natural causes is a disadvantage compared to an alignment which will be installed in a more secure environment. The Highway 89 corridor has unstable mountain slopes, a major river which is subject to flooding and a dense pine forest canopy with significant forest fire potential. This subcriterion attempts to estimate the threat posed by flooding, erosion, landslides and fire to each alignment alternative. This subcriterion will have a "Less Important" influence on an alternative's final operations and maintenance criterion score.

B. Engineering

The design and constructability of the pipeline is a "Critical" criterion to consider when selecting alternative alignments, since construction challenges have the potential to cause a significant increase in project costs and/or delay in schedule, and could impact the feasibility of constructing the project as a whole. The engineering criterion considers the potential ease of construction relative to the geology (soils), regulatory compliance, topography, accessibility and work conditions along the alternative alignments. If alternative corridors contain steep, rugged slopes, rock outcroppings, retaining walls, or major obstacles, special construction methods will likely be necessary which will increase construction costs and make for difficult work conditions. The following six subcriteria are used to determine the overall score for engineering for each alternative.

Constructability

Open trench construction is the preferred method for the installation of the transmission main from the Town of Truckee to Squaw Valley. Large heavy equipment will be used to excavate a trench approximately 4-8 feet deep and 3-5 feet wide with finished surfaces to match adjacent surfaces. Bedding and backfill materials will need to be trucked in and staged near construction activities. In cases of river crossings, culvert crossings or bridge crossings the pipeline will need to be installed using a jack and bore method or in an insulated sleeve secured to the bridge. Alignments shown in Figure 4-1which have a high number of special crossings, remote access, challenging

terrain or narrow access will be ranked unfavorably in this subcriteria through the metrics detailed above. This subcriterion will have a "Critical" influence on an alternative's final engineering criterion score.

Geotechnical Constraints

Geotechnical factors are "Very Important" in determining the appropriate construction methods, pipe materials and backfill requirements, and the overall feasibility of construction. Several of the alternative corridors are located in areas with rock outcroppings. Rock trenching techniques are required when rock is encountered in the trenching process. These techniques are more costly and time consuming than standard open cut trenching techniques. Rocky soils will be difficult to reuse in trench backfill activities and need to be hauled offsite. Retaining wall construction and design would also be required where the pipeline traverses steep side slopes. This subcriterion accounts for any particular intricacies associated with difficult excavation such as blasting and slope stability issues, retaining walls, or traversing terrain which may increase construction challenges. Lower ranks are given to alternatives that go through difficult areas identified in the preliminary investigation phases of this project.

Accessibility

Accessibility plays an "Important" role on an alternative's final engineering criterion score, since heavy equipment and large trucks will need access to the work site. Poor accessibility due to light duty bridges and private property will slow the construction progress and significantly impact/increase the mobilization constraints. Within this subcriterion, the alternative is assessed for how accessible it is during construction, such as the relative ease associated with getting construction equipment and materials in and out of the work site. Alternatives that are entirely or almost entirely accessible by way of existing public roadways are given the highest scores and those that are accessed by way of private roads and bridges are given the lowest scores.

Impact to Existing Facilities

With the Highway 89 corridor being a primary access route between the Town of Truckee and North Lake Tahoe, multiple utilities have infrastructure installed either above or below ground. Considerations for how an alignment will impact existing infrastructure is an "Important" factor in determining an alternative's final engineering criterion score and in turn evaluating the feasibility of the proposed project. Alternatives which would require shutdowns, stabilization or re-alignment of existing utilities will rank lower than those which can be constructed without any interference.

Compliance with SWRCB Drinking Water Regulations

While compliance with the California State Water Resource Control Board (SWRCB) regulations is necessary for project permitting, many regulations can be waived or modified according to previously accepted guidance documents and regulator judgement. However, waivers are never a sure thing and any alignment which depends on a modification to an existing regulation should be seen as less feasible than one which does not require special consideration. Due to this variability, this subcriteria has been assigned a "Less Important" weight on an alternative's final engineering criterion score in this analysis.

Flood Plain

When designing and constructing potable water supply facilities, the threat of contamination from flood events should be kept to a minimum. Underground transmission pipelines do not offer a high level of exposure for flood waters to enter into the system, however entrance through an air release blowoff is present. For this reason, this subcriterion will have a "Less Important" weight on an alternative's final engineering criterion score. Alignments which are installed further away from and at a higher elevation than the Truckee River will be ranked higher than those which are closer to the flowline of the river.

C. Public and Regional Impacts

It is important to acknowledge the political sensitivity and concerns of the general public throughout the Truckee area. These concerns generally center on the import of water to Squaw Valley from Martis Valley and are the same for all project alternatives. The issues of political sensitivity and public perception will continue to be mitigated throughout the project through public outreach and education. Therefore, political sensitivity and public perception issues are not considered as evaluation criteria at this phase of the project.

So, these subcriteria acknowledge the potential aesthetic impacts to the public as well as regional benefits associated with the project and are considered "Important" to the evaluation.

Potential for Opposition

This subcriterion evaluates the potential for public opposition as it relates to the consideration of traffic, noise and air quality impacts, the proximity of the waterline and appurtenances to private and commercial properties, and potential impacts to private property. Alternatives that are within private property and residential/commercial corridors will be given lower scores since they are more likely to receive opposition from local landowners. This subcriterion will have a "Critical" consideration in an alternative's public and regional impact criterion score.

Aesthetic Impacts

This subcriterion evaluates the short and long term impacts that will exist during and after construction. Short term impacts include construction related tasks such as clearing and grubbing, grading, material and equipment staging areas, and construction vehicle access. Construction related aesthetic impacts will be higher when in close proximity to residential areas. Long term impacts include those realized after construction is complete, and include changes in topography, removal of vegetation, visibility of appurtenances, and maintenance related activities. These impacts will also be higher when in close proximity to residential areas. This subcriterion will have a "Very Important" consideration in an alternative's public and regional impact criterion score.

Potential Regional Benefits

Water supply and construction of a pipeline in the Highway 89 corridor can have substantial positive impacts to the community. This would be seen in enhanced fire protection facilities (i.e. fire hydrants), a potential potable water source to individual and small development areas in the

Truckee River canyon, and development of a utility corridor that may provide enhanced communication services to these same residences as well as Squaw and Alpine valleys. Alternative alignments that are more conducive to providing these regional benefits will be given higher scores. This subcriterion will have an "Important" consideration in an alternative's public and regional impact criterion score.

Agency Cooperation/Dependence

Construction of the project will require close coordination and cooperation with many local agencies, including NCSD, TDPUD, TTSA, and Placer County, at a minimum. Reliance on NCSD and TDPUD will be required for potential water supply and use of existing infrastructure to wheel water to Squaw Valley. The pipeline alternatives are also potentially reliant on acceptance/cooperation with existing utilities and agencies, such as the TTSA TRI interceptor and the proposed Placer County Bike Path. Alternatives that minimize this reliance will be given higher scores. This subcriterion will have a "Very Important" consideration in an alternative's public and regional impact criterion score.

D. Environmental

Environmental considerations are weighted "Very Important" because alternatives that require environmental permits, California Environmental Quality Act (CEQA) compliance, and National Environmental Policy Act (NEPA) have the potential to significantly increase project costs and schedule, or directly impact the viability of a project should the permits become impossible to obtain, or the environmental mitigations become prohibitively costly or unreasonable. California's public agencies under CEQA must disclose and avoid or mitigate to the extent feasible, all probable significant environmental impacts that could result from the District's proposed discretionary action or project.

An ideal project would not have the potential to significantly affect the environment, requiring few, if any mitigation measures. Environmental considerations criterion received a high weighting due to the fact that, during evaluation of the preliminary alternatives, it was a primary criteria used to define feasibility of preliminary corridors in an effort to avoid or minimize significant environmental issues wherever possible. The recommended alternative would require compliance with CEQA, 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 1602, two Regional Board general orders, and other local permits. Additionally, depending on the alternative selected NEPA and use permits could be required.

Within the environmental consideration criterion the overall level of difficulty, the potential to trigger NEPA compliance, the potential costs of obtaining individual permits, and the costs for mitigation measures anticipated for each alternative corridor are assessed. The score for this criterion is comprised of the scores of the subcriteria that are listed below. The subcriteria assigned the maximum weight of '10' were designated so since they are most heavily considered in both the CEQA and Federal and State environmental permitting processes. The alternative with the highest score for this criterion will be the alternative that has been assessed to have the least

environmental impact, and the least difficult and least costly to take through the environmental permitting and CEQA processes.

Water Resources

Potential "Waters of the US" are federally regulated under the Clean Water Act, which increases the difficulty of obtaining permits as well as the associated mitigation costs. Therefore, this subcriterion is considered "Critical" when obtaining environmental permits and completing the CEQA process. This subcriterion considers the portions of the pipeline corridors that are adjacent to, near or cross potential water bodies of the US, such as creeks, streams, drainages, and wetlands protected under the Clean Water Act, Section 404. The entire project as a whole will trigger the CWA Section 404 permit process and will require completion of the CEQA process, regardless of which alignment is chosen. However, from a permit complexity and mitigation perspective, and in order to reduce the overall impacts to these waters, it is preferred to avoid or reduce the number of such impacts whenever possible. The more potential waters of the US that are impacted, the more potential there is to impact the project costs or construction schedule. Therefore, the alternative assessed as having the fewest potential impacts to waters of the US is given the highest score and the one(s) assessed as having the most potential impacts to the waters of the US is given the lowest score.

Riparian zones are essential to soil conservation (erosion control) in protecting aquatic environments and providing wildlife habitat and food. If riparian zones are damaged during construction, restoration is possible by replanting and implementing erosion control measures, however damage to these zones is undesirable because it makes the CEQA and permitting process more difficult, so this metric is weighted "Critical" under the Environmental Considerations Criterion. This metric considers the portions of the pipeline corridor that cross riparian zones (identified by Placer County and aerial images) that are likely regulated by the CDFW.

Alternatives crossing riparian zones that result in substantial obstructions, diversions or changes to natural flow require streambed alteration agreements. The alternative that has the potential to impact the most riparian zones or that may require the most streambed alteration agreements is given the lowest score and the alternative that has the fewest impacts to riparian zones is given the highest score.

The number of stream crossings has the potential to impact water quality. While Waters of the US and State permitting covers potential impacts associated with stream impacts, additional potential CEQA impacts arise that are likely to trigger additional hydrology and water quality mitigation measures. Alternatives that have more stream crossings require more Best Management Practices (BMPs) and avoidance measures that can add to project costs. These alternatives that have more stream crossings are given the lowest score and alternatives with fewer stream crossings are given higher scores.

Biological Resources

This subcriterion is considered "Critical" since special status species are typically the focus of avoidance, minimization and mitigation requirements under CEQA, and impacting their habitat or the individuals involves the approval of and environmental permits from State and/or Federal

public agencies. This subcriterion assesses the construction impacts to areas that have federal or state listed plant and wildlife species or their potential habitats protected under the Federal or State Endangered Species Acts (ESA). The alternative that appears to have the fewest potential impacts to these species and/or their habitats is given the highest score and the alternative that appears to have the most potential impacts to these species and/or potential habitats receives the lowest score.

Species of Special Concern are those species not listed as threatened or endangered under the federal or state ESA but considered sensitive by state or federal agencies or scientific based groups. These species require evaluation under CEQA and can require mitigation measures to reduce potential impacts. Therefore, the metric was given a slightly less than "Important" weight and alternatives with a greater potential for impacts were given lower scores while those alternatives with a lesser potential were given higher scores.

The Placer County tree ordinance mandates that a permit be obtained for removal or disturbance of any tree over six inches in breast height diameter. Since the District is a special district for water utility, it is exempt from the County ordinance. Due to the exemption, this metric is considered slightly less than "Important" compared to the other subcriteria under the Environmental Considerations Criteria. Within this metric, impacts to trees due to disturbance of or the need to remove these trees during construction activities is assessed. Acres of wooded areas within each alternative were assessed to evaluate the need for potential tree trimming. The highest score is given to corridors that have the least impact to trees by staying within existing roads, previously disturbed lands, and/or the areas of the lowest tree density.

Cultural Resources

If it is determined that a project may have a substantial adverse change to historical and archaeological resources or disturbs human remains, alternative plans or measures to mitigate the effects to the resource(s) must be considered. Significant cultural resource impacts may require federal permitting under Section 106 of the National Historic Preservation Act, so this subcriterion is weighted "Critical" under Environmental Considerations Criterion. Within this subcriterion, consideration is given to the portions of the alignments that traverse areas of cultural resource sensitivity. An impact is considered significant if it results in a substantial adverse change to the resource, such as demolition, replacement, substantial alteration, and relocation.

Cultural resource sites are rated by sensitivity levels of low, moderate and high by evaluating the proximity to water and the slopes of the area. The alternative that has the greatest potential to impact culturally sensitive areas and/or impact the areas of highest sensitivity is given the lowest score and the alternative that has the least potential to impact culturally sensitive areas or the areas with the lowest cultural resource sensitivity is given the highest score.

Land Use Constraints

It is preferable that the corridor not conflict with existing and future land use designations or uses. This subcriterion is considered "Important" to the environmental permitting and CEQA process. Land use constraints are typically associated with zoning issues; incompatible use issues relative to neighboring properties; and general planning issues relative to moratoriums, easements, or growth constraints. Additionally land use constraints can result from requirements of additional

permitting and NEPA triggers for crossing US forest service lands or encroachment permits for being within State Highway Right-of-Way. Alternatives that are compatible with nearby land uses are given higher scores than those that would be incompatible with nearby land uses. Alternatives that cross US Forest Service lands (metric weight: 10) were given lower scores due to extra permitting and NEPA compliance requirements, while alternatives that cross private property were ranked for potential to conflict with the existing use or generate controversy (metric weight: 7.5). Alternatives within Caltrans (state highway) Right-of-Way were given a lower importance ranking of 2.5 because of the relatively easy encroachment permit process.

Another factor considered in evaluating land use constraints was the amount of disturbed lands. This metric is weighted "5" under the evaluation criteria. Corridors that remain in previously disturbed areas have significantly fewer environmental impacts than those within undisturbed lands. This metric considers the quantity of the corridor that is within disturbed lands, such as paved and dirt roads. The highest score is given to the alternative corridor that will have the least impact to undisturbed land (outside of existing paved or dirt roadways or driveways), because it has the potential to simplify the CEQA process.

Noise pollution is inherent to any construction project and is temporary in nature. Employing mitigation measures can significantly reduce the disturbance to sensitive receptors, such as residences, by limiting construction hours of operation, locating staging areas and hauling routes away from residences wherever possible, and operating noisy equipment during optimal weekday hours when homeowners are away from their residences. Due to the sensitivity of the project area and the public scrutiny applied this potential impact is considered important. The potential for night construction required within the Caltrans Right-of-Way is just one factor that would limit the effectiveness of potential mitigation. Air pollution due to dust generated during construction can be substantially minimized by using Best Management Practices (BMPs), such as staying within paved roads when constructing and hauling materials, covering removed soils and backfill when not in use, as well as regular watering of exposed working areas. Consideration is given to the level of and potential for dust to be generated during construction activities and the potential for complaints about dust pollution from nearby residences within this subcriterion.

This subcriterion attempts to assess the relative potential for complaints and the associated mitigation measures required to minimize impacts to residents due to the noise of construction activities and the vicinity of the construction in relation to residential areas. Higher scores are given to construction locations that are outside of residential zones compared to the alternatives within or near residential zones and higher scores are given to alternatives that have greater pipeline lengths within paved roadways and that are outside of residential areas.

Reduction of traffic impacts is possible by providing alternate routes or by only closing one lane during construction activities, constructing during nonpeak hours (at night), and regulating construction traffic vehicles. The alternative corridors are located along the Truckee River along Highway 89 with few alternate routes available and traffic impacts are considered a moderate concern. Therefore, this metric is considered "Less Important" than others under the environmental criterion. This metric will assess the level of traffic impacts during construction activities within public and private roadways. Alternative corridors within private roads that have little to no other alternate access routes, or alternatives within roads that provide the sole or primary access to many homes are given lower scores than alternative corridors within public

roads and Highway 89 that have one or more alternate routes during construction or have few residents relying on them. The alternative with the fewest traffic impacts is given the highest score.

E. Right of Way Requirements

Right of way (ROW) is an "Important" criterion in determining the most feasible alternative corridor. By locating the corridor in Public ROW, it potentially reduces the environmental impacts, property owner opposition, and project costs. The required land acquisition and associated costs are also reduced by staying within public ROW or existing PUE's eliminating the need to purchase permanent easements. The acquisition of temporary construction easements is included as a subcriterion for the following reasons: construction easements in public ROW are deemed more probable, and some alignments would require construction easements through private property. Finally, the terms of the easement carry significance since a permanent easement would be favorable over a renewable easement or a long term maintenance agreement.

Permanent Easements

The alternative alignments proposed along the Highway 89 corridor traverse a mix of public and private property for the entire eight miles from Truckee to Squaw Valley. Since it would be infeasible to expect the District to purchase all of the property inside of an alignments corridor, an access and utility easement will be necessary for installation, maintenance and operation. Due to the importance of easements, the probability of obtaining an easement becomes vital to the feasibility of an alignment. Public entities, federal or state, are typically considered preferable to that of private land owners since they commonly deal in the granting of easements as opposed to private land owners. An existing easement is also preferred as it sets a precedent for this project to obtain an easement as well. Alignments which cross multiple private parcels or have a high degree of uncertainty tied to the acquisition of an easement will rank lower than those which do not. This subcriterion will have a "Critical" consideration in an alternative's ROW requirements criterion score.

Temporary Construction Easements

Temporary construction easements will be required to account for materials staging, trench spoils, and equipment access during construction. It is not feasible to require a contractor to stay within the footprint of the permanent easement as the permanent width is sized for long term operation and maintenance activities. This evaluation will prioritize the type of owner, public or private, with whom the easement is secured and will reward a shorter length of temporary easement over a longer one. This subcriteria carries a weight of "Less Important" on an alternative's final ROW requirements criterion score.

7.0 DETAILED EVALUATION CRITERIA AND METHOD – WATER SOURCE

The detailed evaluation of the source location is based upon the assumption that the District should attempt to secure additional capacity from a regional utility's existing source prior to developing a new source alternative as presented in this evaluation. If the District is unable to reach an agreement with another utility, they should implement the highest ranking alternative provided in this analysis.

Similar to the pipeline analysis, this section includes the non-economic matrix evaluation method as well as a presentation of the evaluation criteria and subcriteria.

7.1 SOURCE EVALUATION METHOD

With careful consideration given to the goals and objectives of the project and the needs of District, the project team initially developed the evaluation criteria, subcriteria, and weighting convention assigned to each. The District was then solicited for review, input and acceptance of these parameters.

Eight evaluation criteria were used to compare the groundwater source location alternatives:

1. Subsurface Conditions
2. Surface Conditions
3. Water Quality
4. Environmental
5. Political and Public Impacts
6. Right-of-Way Requirements
7. Operations and Maintenance
8. Engineering

Each criterion was assigned a weight based on the criterion's importance to the project as a whole, with a maximum of ten (10), which represents critical importance, and a minimum of zero (0), which represents the least importance. The source location evaluation uses the same weighting scale as presented in Table 4.

Table 8 applies the weighting scale to each of the eight evaluation criteria and represents a normalization of the weighting, which reflects the relative contribution that a particular criterion has on the overall ranking relative to the other criteria. This is expressed as a percentage of the sum of all criterion weights. In this case there are eight criteria categories that were weighted separately. These priorities reflect the total criteria scoring equaling 100 percent.

Table 8 – Water Source Criteria Weights and Priorities

Criteria	Weight	Priority
Subsurface Conditions	10	16.0
Surface Conditions	7.5	12.0
Water Quality	10	16.0
Environmental	7.5	12.0
Political and Public Impacts	5	8.0
Right-of-Way Requirements	5	8.0
Operations and Maintenance	7.5	12.0
Engineering	10	16.0
Total	**62.5**	**100**

The eight main criteria listed above were broken down into a total of twenty-four (24) subcriteria, which are specific characteristics used to compare how well each alternative source meets each criterion. The non-economic evaluation method proceeds in the same manner detailed previously in the pipeline evaluation. *Alternative scoring will be completed as part of TM No. 2 – Alternatives Evaluation.*

Table 9 below summarizes the subcriteria weights, priorities, and matrix weights for the water sources. A summary of criteria, subcriteria, and metric weights, priorities and matrix weights is provided in Table 10.

Table 9 – Water Source Subcriteria Weights, Priorities, and Matrix Weights

Subcriteria	Weight	Priority	Matrix Weight
Subsurface Conditions Weight = 10, Priority = 16%			
Proximity to Areas with Acceptable Groundwater Quality	10	25%	4.0
Anticipated Depth-To-Water and Well Depth	7.5	19%	3.0
Hydrogeologic Conditions Conducive to Providing Necessary Well Yield	10	25%	4.0
Geologic Material Where Secondary Permeability Provides Most of the Well Yield	7.5	19%	3.0
Location in Area in a Highly Exploited Portion of Aquifer	5	13%	2.0
Subtotal	40	100%	16.0

Subcriteria	Weight	Priority	Matrix Weight
Surface Conditions Weight = 7.5, Priority = 12%			
Proximity to Springs and/or Other Surface Water Features, and Complies with TROA Guidelines and General Guidelines of the MVGMP	10	40%	4.8
Proximity to Private or Public Wells	7.5	30%	3.6
Distance from Areas Potential Inundated with Flood Water	2.5	10%	1.2
Distance from Sources of Possible Groundwater Contamination (Natural or Anthropogenic)	5	20%	2.4
Subtotal	25	100%	12.0
Water Quality Weight = 10, Priority = 16%			
Water Quality Compared to Squaw Valley	10	67%	10.7
Level of Treatment Required	5	33%	5.3
Subtotal	15	100%	16.0
Environmental Weight = 7.5, Priority = 12%			
Waters	10	33%	4.0
Biological Resources	10	33%	4.0
Cultural Resources	5	17%	2.0
Land Use	5	17%	2.0
Subtotal	30	100%	12.0
Public/Regional Impacts Weight = 5, Priority = 8%			
Potential for Opposition	10	33%	2.7
Aesthetic Impacts	7.5	25%	2.0
Potential Regional Benefits	5	17%	1.3
Agency Cooperation/Dependence	7.5	25%	2.0
Subtotal	30	100%	8.0
Right of Way Requirements Weight = 5, Priority = 8%			
Permanent Easements	10	80%	6.4
Temporary Construction Easements	2.5	20%	1.6
Subtotal	12.5	100%	8.0
Operation & Maintenance Weight = 7.5, Priority = 12%			
Accessibility	7.5	38%	4.5
Level of Treatment Required	7.5	38%	4.5
Impacts from Repair and Maintenance	5	25%	3.0
Subtotal	20	100%	12.0
Engineering Weight = 10, Priority - 16%			
Constructability	10	50%	8.0
Power Supply	10	50%	8.0
Subtotal	20	100%	16.0

TABLE 10 - NON ECONOMIC EVALUATION - WATER SOURCE

Criteria			Subcriteria			Subcriteria Metric				
Criteria	**Weight**	**Priority (%)**	**Sub criteria**	**Weight**	**Priority (%)**	**Metric**		**Weights**	**Priority (%)**	**Matrix Weight**
Subsurface Conditions	10	16.0%	**Proximity to Areas with Acceptable Groundwater Quality**	10	25.0 %	Water Quality Data Available		5	100%	4.0
							Sub-total	**5**	**100%**	**4.0**
			Anticipated Depth-To-Water and Well Depth	7.5	18.8 %	Depth to Water		7.5	50%	1.5
						Depth of Well		7.5	50%	1.5
							Sub-total	**15**	**100%**	**3.0**
			Hydrogeologic Conditions Conducive to Providing Necessary Well Yield	10	25.0 %	Existing well data available to base yield estimates		7.5	43%	1.7
						Exploratory drilling program requirements		10	57%	2.3
							Sub-total	**17.5**	**100%**	**4.0**
			Geologic Material Where Secondary Permeability Provides Most of the Well Yield	7.5	18.8 %	Nearby wells produce water mainly from primary porosity of unconsolidated sediments		7.5	60%	1.8
						Title 22 capacity rating (alluvial vs. bedrock)		5	40%	1.2
							Sub-total	**12.5**	**100%**	**3.0**
			Location in Area in a Highly Exploited Portion of Aquifer	5	12.5 %	Historic groundwater usage		7.5	50%	1.0
						Water level trends, if known		7.5	50%	1.0
							Sub-total	**15**	**100%**	**2.0**
			Sub-total	**40**	**100.0 %**					
Surface Conditions	7.5	12.0%	**Proximity to Springs and/or Other Surface Water Features, and Complies with TROA Guidelines(b) and General Guidelines of the MVGMP**	10	40.0 %	Affect on springs or streams, including Truckee River and tributaries		7.5	60%	2.9
						Compliance with TROA and MVGMP		5	40%	1.9
							Sub-total	**12.5**	**100%**	**4.8**
			Proximity to Private or Public Wells	7.5	30.0 %	Proximity to private or public wells		10	67%	2.4
						Mitigation required to reduce interference		5	33%	1.2
							Sub-total	**15**	**100%**	**3.6**
			Distance from Areas Potentially Inundated with Flood Water	2.5	10.0 %	Flood Plain Delineation		2.5	100%	1.2
							Sub-total	**2.5**	**100%**	**1.2**
			Distance from Sources of Possible Groundwater Contamination (Natural and Anthropogenic)	5	20.0 %	Distance to natural contamination		10	50%	1.2
						Distance to anthropogenic contamination		10	50%	1.2
							Sub-total	**20**	**100%**	**2.4**
			Sub-total	**25**	**100.0 %**					
Water Quality	10	16.0%	**Water Quality Compared to Squaw Valley**	10	66.7 %	Primary Standards		10	33%	3.6
						Secondary Standards		10	33%	3.6
						Radionuclides		10	33%	3.6
							Sub-total	**30**	**100%**	**10.7**
			Level of Treatment Required	5	33.3 %	Chlorination		10	40%	2.1
						pH Adjustment		5	20%	1.1
						Fe, Mn, As, surface water, etc.		10	40%	2.1
							Sub-total	**25**	**100%**	**5.3**
			Sub-total	**15**	**100.0 %**					
Environmental	7.5	12.0%	**Waters**	10	33.3 %	Waters of US		10	44%	1.8
						Waters of State		10	44%	1.8
						Stream Crossings		2.5	11%	0.4
							Sub-total	**22.5**	**100%**	**4.0**
			Biological Resources	10	33.3 %	Listed Species		10	40%	1.6
						Critical Habitat		10	40%	1.6
						Species of Concern		2.5	10%	0.4
						Woodlands		2.5	10%	0.4
							Sub-total	**25**	**100%**	**4.0**
			Cultural Resources	5	16.7 %	Proximity to Water		10	33%	0.7
						Slopes		10	33%	0.7
						Known Resources		10	33%	0.7
							Sub-total	**30**	**100%**	**2.0**
			Land Use	5	16.7 %	USFS Lands		10	29%	0.6
						Private Property		7.5	21%	0.4
						Caltrans ROW		2.5	7%	0.1
						Sensitive Receptors		7.5	21%	0.4
						Traffic		2.5	7%	0.1
						Air Quality/Green House Gases		5	14%	0.3
							Sub-total	**35**	**100%**	**2.0**
			Sub-total	**30**	**100.0 %**					
Public/Regional Impacts	5	8.0%	**Potential for Opposition**	10	33.3 %	Consideration to traffic, noise, air quality impacts		10	100%	2.7
						Proximity to residences/commercial properties				
						Potential impacts to private property				
							Sub-total	**10**	**100%**	**2.7**
			Aesthetic Impacts	7.5	25.0 %	Short term construction impacts (drilling, grading, staging areas)		7.5	100%	2.0
						Long term impacts (construction of well house, removal of vegetation, visibility of appurtenances)				
							Sub-total	**7.5**	**100%**	**2.0**
			Potential Regional Benefits	5	16.7 %	Supplemental source for existing water system (TDPUD, NCSD)		10	100%	1.3
							Sub-total	**10**	**100%**	**1.3**
			Agency Cooperation/Dependence	7.5	25.0 %	Reliance on neighboring agencies for use of existing infrastructure		7.5	100%	2.0
							Sub-total	**7.5**	**100%**	**2.0**
			Sub-total	**30**	**100.0 %**					
ROW Requirements	5	8.0%	**Permanent Easements**	10	80.0 %	Probability of Obtaining an Easement		10	33%	2.1
						Cost of Obtaining an Easement		10	33%	2.1
						% within Existing ROW/PUE Easement		5	17%	1.1
						Public or Private easement		5	17%	1.1
							Sub-total	**30**	**100%**	**6.4**
			Temporary Construction Easements	2.5	20.0 %	Ability to secure temporary construction easements		2.5	100%	1.6
							Sub-total	**2.5**	**100%**	**1.6**
			Sub-total	**12.5**	**100.0 %**					
O & M	7.5	12.0%	**Accessibility**	7.5	37.5 %	Remote Locations		10	40%	1.8
						Paved Road v. Dirt Road		7.5	30%	1.4
						Type of Vehicle Access:		5	20%	0.9
						Snow Cat, ATV, Light Truck, etc.				
						Snow Removal		2.5	10%	0.5
							Sub-total	**25**	**100%**	**4.5**
			Level of Treatment Required	7.5	37.5 %	Type of treatment processes		10	100%	4.5
							Sub-total	**10**	**100%**	**4.5**
			Impacts from Repair and Maintenance	5	25.0 %	Pedestrian/Public Impacts		10	100%	3.0
							Sub-total	**10**	**100%**	**3.0**
			Sub-total	**20**	**100.0 %**					
Engineering	10	16.0%	**Constructability**	10	50.0 %	Material Staging		10	36%	2.9
						Drilling equipment and construction vehicle access		10	36%	2.9
						Development and testing residuals and water disposal		7.5	27%	2.2
							Sub-total	**27.5**	**100%**	**8.0**
			Power Supply	10	50.0 %	Location of Available power supply		10	100%	8.0
							Sub-total	**10**	**100%**	**8.0**
			Sub-total	**20**	**100.0 %**					
Total	**62.5**	**100%**								**Total**

Weight = value assigned to given criterion (or sub criterion) with respect to other criteria (or sub criteria).

Priority = the value of weights after normalization.

Matrix Weight = the metric priority multiplied by the criterion priority.

7.2 WATER SOURCE NON-ECONOMIC CRITERIA AND SUBCRITERIA

Detailed descriptions and assigned weightings for the criteria and subcriteria are discussed in the sections below. Any subcriterion which is also applicable to the pipeline evaluation and has already been detailed will not be replicated in this section. The weight assigned to each of the criteria has significant bearing on the final score for each alternative. Weights reflect the judgment of the project team, with input provided from the District.

A. Subsurface Conditions

The performance and reliability of any underground drinking source is highly dependent on a variety of subsurface conditions. The project team developed a list of five subcriterion which provides a broad view of elements related to underground conditions. Because the ability of an underground source to produce water is of "Critical" importance, this criteria has been assigned a weight which reflects that importance.

Proximity to Areas with Acceptable Groundwater Quality

Groundwater quality of any new source will have a "Critical" weight in the evaluation of a source alternative. This subcriterion will evaluate the horizontal proximity between the proposed well location and existing wells with known water quality. A proposed location alternative which is closer to an existing well with good water quality will be ranked higher than a location which is further away or near a well with poor water quality. If adjacent water quality is unavailable, the location shall be scored higher than a location with poor groundwater quality.

Anticipated Depth-To-Water and Well Depth

Depth to groundwater is a "Very Important" consideration in well design and in a source alternative's final subsurface condition criterion score since as the size of the pump increases driving up construction and operation costs. Deeper wells also cost more to construct. Well locations with shallower groundwater will rank higher than those with aquifers further from the surface.

Hydrogeologic Conditions Conducive to Providing Necessary Well Yield

Well yield is a "Critical" consideration in the performance evaluation of a groundwater well and it will play an equal role in determining the location for the well. Location alternatives will be assessed for the availability of existing well data and for the need for an exploratory drilling program. Locations with limited data available and which require exploratory drilling will rank lower than those which have existing wells or information to base well yield estimates off of.

Geologic Material Where Secondary Permeability Provides Most of the Well Yield

This subcriterion addresses the geologic material associated with primary production of water. This is considered "Very Important" in the selection of a location for a well. Wells with production zones primarily in unconsolidated sediments will receive higher ratings that wells constructed in bedrock. This subcriterion also addresses the SWRCB regulations governing well capacity ratings,

based on the fact that determining well capacity is impacted by completion in alluvial material versus bedrock.

Location in Area in a Highly Exploited Portion of Aquifer

This subcriterion will play an "Important" role in the source location evaluation through assessment of historic groundwater usage and any water level trends, if available. Similar to other subcriteria which attempt to evaluate well yield, the construction of a new source in a highly exploited area will rank lower than that of a location with a minimal amount of groundwater pumping. Locations with little available data will rank slightly higher than those with poor performance data.

B. Surface Conditions

While many of the subsurface conditions are difficult to assess without extensive testing, surface conditions are capable of thorough investigation and will play a "Very Important" role in a preferred source location selection. Well locations will be evaluated against three subcriteria which will score a well location with favorable surface conditions over that of a location with unfavorable conditions.

Proximity to Springs and/or Other Surface Water Features

There are two major water features within the influence of the proposed source locations which are the Truckee River and the MVGB and the interaction between the proposed well location and these features will have a "Critical" weight in the Surface Condition assessment. Both features have existing guideline documents which detail the impact of source locations on these features and the surrounding areas. Well locations which do not affect nearby springs, streams and tributaries will rank higher than those which do not. Also, locations which comply with both the Truckee River Operating Agreement (TROA) and the Martis Valley Groundwater Management Plan (MVGMP) will rank higher than those which do not.

Proximity to Private or Public Wells

Interference between groundwater sources is "Very Important" consideration when evaluating a new water source and it will play an equal role in determining an alternative's final surface condition criterion score. It is assumed that the closer the new well is drilled to an existing public or private well, the more negative influence the new well may have on that existing source. Locations in remote areas will rank higher than those in highly developed areas. Well locations will also be assessed for the need of an operational plan to minimize its impact on an existing source. Wells which do not require mitigation will rank higher than those that do require an operational plan.

Distance from Sources of Possible Groundwater Contamination

The benefit of a surface condition assessment is the ability to accurately pinpoint sources of potential contamination caused by either natural or anthropogenic conditions. Alternative locations will be ranked according to their proximity to these contaminant locations, with a further distance ranking higher than that of a closer distance. Since many of the proposed well locations

are large areas as shown on Figure 3-2, it would be in the best interest of the District to relocate the well to a location which would not be under the threat of groundwater contamination. For this reason, this subcriterion will only have an "Important" weight on an alternative's subsurface condition criterion score.

C. Water Quality

The District currently provides groundwater to its customers which is non-chlorinated and of excellent quality. Current water treatment in District sources includes the addition of sodium hydroxide for pH adjustment and corrosion control. The District places a "Critical" importance on the quality of any potential water source entering their system and water quality shall have the same importance on an alternative's final score.

Water Quality Compared to Squaw Valley

The water quality of a new source will be assessed across three separate metrics: primary standards, secondary standards and radionuclides. All three metrics will have equal weight in its score with sources which have standards above the maximum contaminant level (MCL) scoring lower than those which pass all MCL's. This subcriterion shall be of "Critical" importance to an alternative's final water quality criterion score.

Level of Treatment Required

Water treatment is not a preferred plan of action by the District. However, a subcriterion which addressed the treatment needs of the new groundwater source is needed in the case that treatment is unavoidable. Well locations which do not need any chlorination, pH adjustment, or treatment of any form will rank higher in this subcriterion than alternatives which require a greater level of treatment.

D. Environmental

Any new well location will impact local waters, biological and cultural resources, and land uses by way of construction activities and the permanent presence of an underground well and a well house. The environmental considerations play a "Very Important" role in the evaluation of a source well location. The subcriterion and metrics for the source location are identical to those discussed in Section 6.12 for the pipeline evaluation, and will therefore not be discussed in any further detail in this section.

E. Public and Regional Impacts

It is important to acknowledge the political sensitivity and concerns of the general public throughout the Truckee area. These concerns generally center on the import of water to Squaw Valley from Martis Valley and are the same for all project alternatives. The issues of political sensitivity and public perception will continue to be mitigated throughout the project through public outreach and education. Therefore, political sensitivity and public perception issues are not considered as evaluation criteria at this phase of the project.

So, these criteria acknowledge the potential aesthetic impacts to the public as well as regional benefits associated with the project and are considered "Important" to the evaluation.

Potential for Opposition

This subcriterion evaluates the potential for public opposition as it relates to the consideration of traffic, noise and air quality impacts, the proximity of the well house and appurtenances to private and commercial properties, and potential impacts to private property. Alternatives that are within private property and residential/commercial corridors will be given lower scores since they are more likely to receive opposition from local landowners. This subcriterion is considered "Critical" for the evaluation.

Aesthetic Impacts

This subcriterion evaluates the short and long term impacts that will exist during and after construction and is considered "Very Important" in the evaluation. Short term impacts include construction related tasks such as well drilling and testing, clearing and grubbing, grading, material and equipment staging areas, and construction vehicle access. Construction related aesthetic impacts will be higher when in close proximity to residential areas. Long term impacts include those realized after construction is complete, and include changes in topography, removal of vegetation, visibility of the well building and appurtenances, and maintenance related activities. These impacts will also be higher when in close proximity to residential areas.

Potential Regional Benefits

Construction of a new municipal production well in the Martis Valley area may have the added regional benefit of providing a supplemental water source for the existing NCSD, Zone 4, and/or TDPUD water systems. The District will use a new production well as an emergency redundant water supply. When not in use by the District, a new well may provide added operational flexibility to one or all of the area water systems. Water source areas that are more conducive to providing these regional benefits will be given higher scores. Potential regional benefits are considered to play an "Important" role in the evaluation.

Agency Cooperation/Dependence

Construction of a new water source requires close coordination and cooperation with NCSD and TDPUD and therefor this subcriterion is "Very Important". Reliance on NCSD and TDPUD will be required for potential use of existing infrastructure to wheel water to Squaw Valley. Water source alternatives that minimize this reliance will be given higher scores.

F. Right of Way Requirements

The acquisition of ROW by the District for a new source location will include the purchase of land for the source itself and an easement for the linear pipeline portion which will connect the new source to existing system infrastructure. In many cases the linear portion will be small, 100 to 500 feet long; however Areas C and D in Figure 3-2 may require pipelines up to one mile in length. The two subcriteria selected for evaluation are identical to those discussed in the pipeline portion of this memorandum and will not be detailed any further in this section. Source alternatives which

require shorter lengths of easements with a fewer number of land owners will rank higher than those which involve a more easements with more land owners. The ROW requirements for the source location will play an "Important" role in determining the highest rated source alternative.

G. Operations and Maintenance

The operations and maintenance criteria for the new groundwater source has been broken into two subcriteria which carry a "Very Important" weight on an alternative's final score in this evaluation. This analysis will evaluate the accessibility of the new locations and provide an estimate of parties affected by an operations or repair activity.

Accessibility

The new well location will require routine inspections and maintenance activities. Therefore, they should have long term accessibility, preferably via paved or dirt roads. Access to the well site and its associated pipeline, will have a "Very Important" effect on an alternative's score in this subcriterion. Wells that are located in remote areas, difficult to access by vehicle, without existing roadways, will receive lower scores than those that are easily accessible by vehicle, either within or near existing roads.

Impacts from Repair and Maintenance

Repair and maintenance activities often require large equipment and construction material staging in order to replace failing infrastructure. This subcriterion is considered "Important" and attempts to evaluate the impacts to the public which may be required during maintenance activities. Areas adjacent to the proposed well locations are used by pedestrians, motorists, bicyclists, hikers and residents. Any location which will impact or limit access to the use of existing facilities will be ranked lower than those which do not.

H. Engineering

The design and constructability of the new groundwater well is a "Critical" criterion to consider when selecting alternative locations. Construction challenges have the potential to cause significant increases in project costs and/or delays in schedule. Due to the unknown nature of potential construction challenges beneath the surface, this criterion will only evaluate ground level conditions/infrastructure. A well location alternative which lends itself well to accommodating well drilling equipment, well drilling materials and has an available power source will score much higher than one which does not. The following two subcriteria are used to determine the final score for each source alternative in the engineering criterion.

Constructability

Constructability plays a "Critical" role in the evaluation and selection of a water source alternative. Well drilling involves large drill rigs which need horizontal and vertical clearance to construct the well. A well location which provides adequate open space for equipment and the staging of materials will be preferable to one which does not. Finally, a location which can accommodate water disposal during well development and testing without impacting adjacent parcels would be

the most preferred as well. Well locations which rank high in these categories will score higher than those which do not.

Power Supply

The availability of power supply is "Critical" to the location of a new water source. A dedicated power supply to the well house location and well will be required regardless of the well location alternative selected as the most preferable. This subcriterion will evaluate each location for proximity to existing power lines, with closer being preferable to further away; and will evaluate the size and phase of the existing power source for its compatibility with an underground well application.

8.0 DETAILED EVALUATION CRITERIA AND METHOD – TERMINAL WATER STORAGE TANK

The detailed evaluation of the terminal tank location is based upon the assumption that the District will create a new pressure zone at the east end of the Valley. Water modeling has been completed as part of the Water Master Plan to define the hydraulic grade requirement for the new tank and the new pressure zone boundary. Based on this, two alternative tank locations have been identified and will be evaluated as part of the project.

Similar to the pipeline analysis, this section includes the non-economic matrix evaluation method as well as a presentation of the evaluation criteria and subcriteria.

8.1 TANK EVALUATION METHOD

With careful consideration given to the goals and objectives of the project and the needs of District, the project team initially developed the evaluation criteria, subcriteria, and weighting convention assigned to each. The District was then solicited for review, input and acceptance of these parameters.

Five evaluation criteria will be used to compare the tank location alternatives:

1. Operations and Maintenance
2. Engineering
3. Public and Regional Impacts
4. Environmental
5. Right-of-Way Requirements

Each criterion was assigned a weight based on the criterion's importance to the project as a whole, with a maximum of ten (10), which represents critical importance, and a minimum of zero (0), which represents least importance. The tank location evaluation uses the same weighting scale as presented in Table 4.

Table 11 applies the weighting scale to each of the five evaluation criteria and represents a normalization of the weighting, which reflects the relative contribution that a particular criterion has on the overall ranking relative to the other criteria. This is expressed as a percentage of the

sum of all criterion weights. In this case there are eight criteria categories that were weighted separately. These priorities reflect the total criteria scoring equaling 100 percent.

Table 11 – Tank Criteria Weights and Priorities

Criteria	Weight	Priority
Operations and Maintenance	5	15.4
Engineering	10	30.8
Public/Regional Impacts	5	15.4
Environmental	7.5	23.1
Right-of-Way Requirements	5	15.4
Total	**32.5**	**100**

The five main criteria listed above were broken down into a total of fifteen (15) subcriteria, which are specific characteristics used to compare how well each alternative meets each criterion. The non-economic evaluation method proceeds in the same manner detailed previously in the pipeline and source evaluations. *Alternative scoring will be completed as part of TM No. 2 – Alternatives Evaluation.*

Table 12 below summarizes the subcriteria weights, priorities, and matrix weights for the tank evaluation. A summary of criteria, subcriteria, and metric weights, priorities and matrix weights is provided in Table 13.

Table 12 – Tank Subcriteria Weights, Priorities, and Matrix Weights

Subcriteria		Weight	Priority	Matrix Weight
Operation & Maintenance Weight = 5, Priority = 15.4%				
Accessibility		7.5	50%	7.7
Impacts from Repair and Maintenance		5	33%	5.1
Impacts from Natural Disaster		2.5	17%	2.6
	Subtotal	15	100%	15.4
Engineering Weight = 10, Priority - 30.8%				
Constructability		10	50%	15.4
Accessibility		5	25%	7.7
Connection to Existing System		5	25%	7.7
	Subtotal	20	100%	30.8
Public Impacts Weight = 5, Priority = 15.4%				
Potential for Opposition		10	57%	8.8
Aesthetic Impacts		7.5	43%	6.6
	Subtotal	17.5	100%	15.4
Environmental Weight = 7.5, Priority = 23.1%				
Waters		2.5	9%	2.1
Biological Resources		10	36%	8.4
Cultural Resources		7.5	27%	6.3
Land Use		7.5	27%	6.3
	Subtotal	27.5	100%	23.1
Right of Way Requirements Weight = 5, Priority = 15.4%				
Permanent Easements		10	80%	12.3
Temporary Construction Easements		2.5	20%	3.1
	Subtotal	12.5	100%	15.4

TABLE 13 - NON ECONOMIC EVALUATION - TANK

Criteria			Subcriteria			Subcriteria Metric			
Criteria	**Weight**	**Priority (%)**	**Subcriteria**	**Weight**	**Priority (%)**	**Metric**	**Weights**	**Priority (%)**	**Matrix Weight**
O & M	5	15.4%	**Accessibility**	7.5	50.0 %	Length of Access Road	7.5	75%	5.8
						Type of Vehicle Access: Snow Cat, ATV, Light Truck, etc.	2.5	25%	1.9
						Sub-total	**10**	**100%**	**7.7**
			Impacts from Repair and Maintenance	5	33.3 %	Property Owner Impacts	5	100%	5.1
						Sub-total	**5**	**100%**	**5.1**
			Impacts from Natural Disaster	2.5	16.7 %	Avalanche	5	50%	1.3
						Landslides	5	50%	1.3
						Sub-total	**10**	**100%**	**2.6**
			Sub-total	**15**	**100.0%**				
Engineering	10	30.8%	**Constructability**	10	50.0 %	Standard v. Non-Standard Methods	10	27%	4.1
						Material Staging	5	13%	2.1
						Construction Vehicle Access	5	13%	2.1
						Slope	10	27%	4.1
						Rock Excavation	7.5	20%	3.1
						Sub-total	**37.5**	**100%**	**15.4**
			Accessibility	5	25.0 %	Length of Access Road	5	50%	3.8
						Existing/New Access Road	5	50%	3.8
						Sub-total	**10**	**100%**	**7.7**
			Connection to Existing System	5	25.0 %	Length of Pipeline	5	40%	3.1
						Difficulty of Construction	7.5	60%	4.6
						Sub-total	**12.5**	**100%**	**7.7**
			Sub-total	**20**	**100.0%**				
Public Impacts	5	15.4%	**Potential for Opposition**	10	57.1 %	Consideration to traffic, noise, air quality impacts	5	25%	2.2
						Proximity to residences	10	50%	4.4
						Potential impacts to private property	5	25%	2.2
						Sub-total	**20**	**100%**	**8.8**
			Aesthetic Impacts	7.5	42.9 %	Short term construction impacts (grading, staging areas)	5	33%	2.2
						Long term impacts (change in topography, removal of vegetation, visibility of tank)	10	67%	4.4
						Sub-total	**15**	**100%**	**6.6**
			Sub-total	**17.5**	**100.0%**				
Environmental	7.5	23.1%	**Waters**	2.5	9.1 %	Waters of US	10	44%	0.9
						Waters of State	10	44%	0.9
						Stream Crossings	2.5	11%	0.2
						Sub-total	**22.5**	**100%**	**2.1**
			Biological Resources	10	36.4 %	Listed Species	10	40%	3.4
						Critical Habitat	10	40%	3.4
						Species of Concern	2.5	10%	0.8
						Woodlands	2.5	10%	0.8
						Sub-total	**25**	**100%**	**8.4**
			Cultural Resources	7.5	27.3 %	Proximity to Water	2.5	11%	0.7
						Slopes	10	44%	2.8
						Known Resources	10	44%	2.8
						Sub-total	**22.5**	**100%**	**6.3**
			Land Use	7.5	27.3 %	USFS Lands	10	31%	1.9
						Private Property	7.5	23%	1.5
						Sensitive Receptors	7.5	23%	1.5
						Traffic	2.5	8%	0.5
						Air Quality/Green House Gases	5	15%	1.0
						Sub-total	**32.5**	**100%**	**6.3**
			Sub-total	**27.5**	**100.0%**				
ROW Requirements	5	15.4%	**Permanent Easements**	10	80.0 %	Probability of Obtaining an Easement	10	33%	4.1
						Cost of Obtaining an Easement	10	33%	4.1
						% within Existing ROW/PUE Easement	5	17%	2.1
						Public or Private easement	5	17%	2.1
						Sub-total	**30**	**100%**	**12.3**
			Temporary Construction Easements	2.5	20.0 %	Ability to secure temporary construction easements	2.5	100%	3.1
						Sub-total	**2.5**	**100%**	**3.1**
			Sub-total	**12.5**	**100.0%**				
Total	**32.5**	**100%**							**Total**

Weight = value assigned to given criterion (or subcriterion) with respect to other criteria (or subcriteria).

Priority = the value of weights after normalization.

Matrix Weight = the metric priority multiplied by the criterion priority.

8.2 TANK NON-ECONOMIC CRITERIA AND SUBCRITERIA

Detailed descriptions and assigned weightings for the criteria and subcriteria are discussed in the sections below. Any subcriterion which is also applicable to the pipeline or source evaluation and has already been detailed will not be replicated in this section. The weight assigned to each of the criteria has significant bearing on the final score for each alternative. Weights reflect the judgment of the project team.

A. Operations & Maintenance

The operations and maintenance of the water tank is a somewhat important consideration in the overall project evaluation. Only certain operational subcriteria are pertinent to a comparative evaluation of tank locations and ultimately the selection of the most preferable site. For these reasons, this criterion gives an "Important" consideration to the operational advantages of any one tank site over another. This criterion attempts to evaluate for each alternative the degree of maintenance, operation and how well the tank site accommodates long term accessibility for maintenance purposes.

Accessibility

Water storage tanks require routine inspections and/or maintenance. Therefore, they should have long term accessibility, preferably via paved or dirt roads. Access to the tank is weighted "Very Important" under the operations and maintenance criterion. This subcriterion evaluates the ability for maintenance crews to access the tank for the purpose of long term maintenance. Lengthy access roads, difficult to access by vehicle, will receive lower scores than those that are easily accessible by vehicle, either within or near existing roads.

Impacts from Repair and Maintenance

Repair and maintenance activities often require large equipment and construction material staging in order to replace segments of failing infrastructure. For this reason, this subcriterion is considered "Important" to the evaluation process. This subcriterion evaluates the additional impacts which may be required during maintenance activities. Items such as property owner impacts will be evaluated for each alternative site. Those alternatives which necessitate additional considerations will be ranked lower than those which do not.

Impacts from Natural Disaster

The water storage tank sites selected to be evaluated as part of this project are somewhat vulnerable to various natural disasters. The tank locations are both located in potentially unstable mountain slopes, potentially subject to landslides and avalanche hazards. This subcriteria is considered generally "Less Important" and attempts to estimate the threat posed by these natural impacts to each tank site alternative.

B. Engineering

The design and constructability of the tank is a "Critical" criterion to consider when selecting alternative sites since construction challenges have the potential to cause a significant increase in

project costs and/or delay in schedule. The engineering criterion considers the potential ease of construction relative to the geology (soils), topography, accessibility and work conditions. If alternative tank sites are located on steep slopes, special construction methods will likely be necessary which will increase construction costs and make for difficult work conditions. The following subcriteria are used to determine the overall score for engineering for each alternative.

Constructability

Constructability in comparing tank site alternatives will be primarily evaluated based on construction methods and type of tank. It is preferable to construct a typical welded steel tank on a site that has favorable topography, soil conditions, and accessibility. Steep topography and soil conditions can require special construction methods materials for a tank including a concrete or steel tank cut into a hillside. This subcriterion is considered "Critical" to the evaluation. Sites with good access and an opportunity to construct a typical at grade welded steel storage tank will be ranked more favorable.

Accessibility

Accessibility plays an "Important" role, since heavy equipment and large trucks will need access to the work site. Poor accessibility due long and narrow access roads and private property will slow the construction progress and significantly impact/increase the mobilization constraints. Within this subcriterion, the alternative is assessed for how accessible it is during construction, such as the relative ease associated with getting construction equipment and materials in and out of the work site. Alternatives that are entirely or almost entirely accessible by way of existing public roadways are given the highest scores and those that are accessed by way of private roads are given the lowest scores. Also, alternatives with shorter access roads are rated more favorably.

Connection to Existing Facilities

Location of the tank will dictate the difficulty in connecting the tank to the existing water system with the construction of waterline. This subcriterion is considered "Important" and relates to the length of the connecting pipeline and its difficulty of construction. Shorter pipeline lengths as well as those that can be constructed within existing roadways or easements, and less steep terrain, will be ranked more favorable.

C. Public and Regional Impacts

These criterion acknowledge the potential aesthetic impacts to the public and are considered "Important" to the evaluation.

Potential for Opposition

This subcriterion is considered "Critical" and evaluates the potential for public opposition as it relates to the consideration of traffic, noise and air quality impacts, the proximity of the tank and appurtenances to private properties, and potential impacts to private property. Alternatives that

are within private property and residential/commercial corridors will be given lower scores since they are more likely to receive opposition from local landowners.

Aesthetic Impacts

This subcriterion is considered "Very Important" and evaluates the short and long term impacts that will exist during and after construction. Short term impacts include construction related tasks such as clearing and grubbing, grading, material and equipment staging areas, and construction vehicle access. Construction related aesthetic impacts will be higher when in close proximity to residential areas. Long term impacts include those realized after construction is complete, and include changes in topography, removal of vegetation, visibility of the tank, and maintenance related activities. These impacts will also be higher when in close proximity to residential areas.

D. Environmental

Any water tank location may impact local waters, biological and cultural resources, and land uses by way of construction activities and the permanent presence of an above ground storage tank. The environmental considerations play a "Very Important" role in the evaluation of a tank location. The subcriterion and metrics for the tank location are identical to those discussed in Section 6.2 for the pipeline evaluation, and will therefore not be discussed in any further detail in this section.

E. Right of Way Requirements

ROW is an "Important" criterion in determining the most feasible tank location. By locating the corridor in public ROW, it potentially reduces the environmental impacts, property owner opposition, and project costs. The required land acquisition and associated costs are also reduced by staying within public ROW or existing PUE's eliminating the need to purchase permanent easements. The acquisition of temporary construction easements is included as a subcriterion for the following reasons: construction easements in public ROW are deemed more probable, and both tank sites would likely require construction easements through private property. Finally, the terms of the easement carry significance since a permanent easement would be favorable over a renewable easement or a long term maintenance agreement.

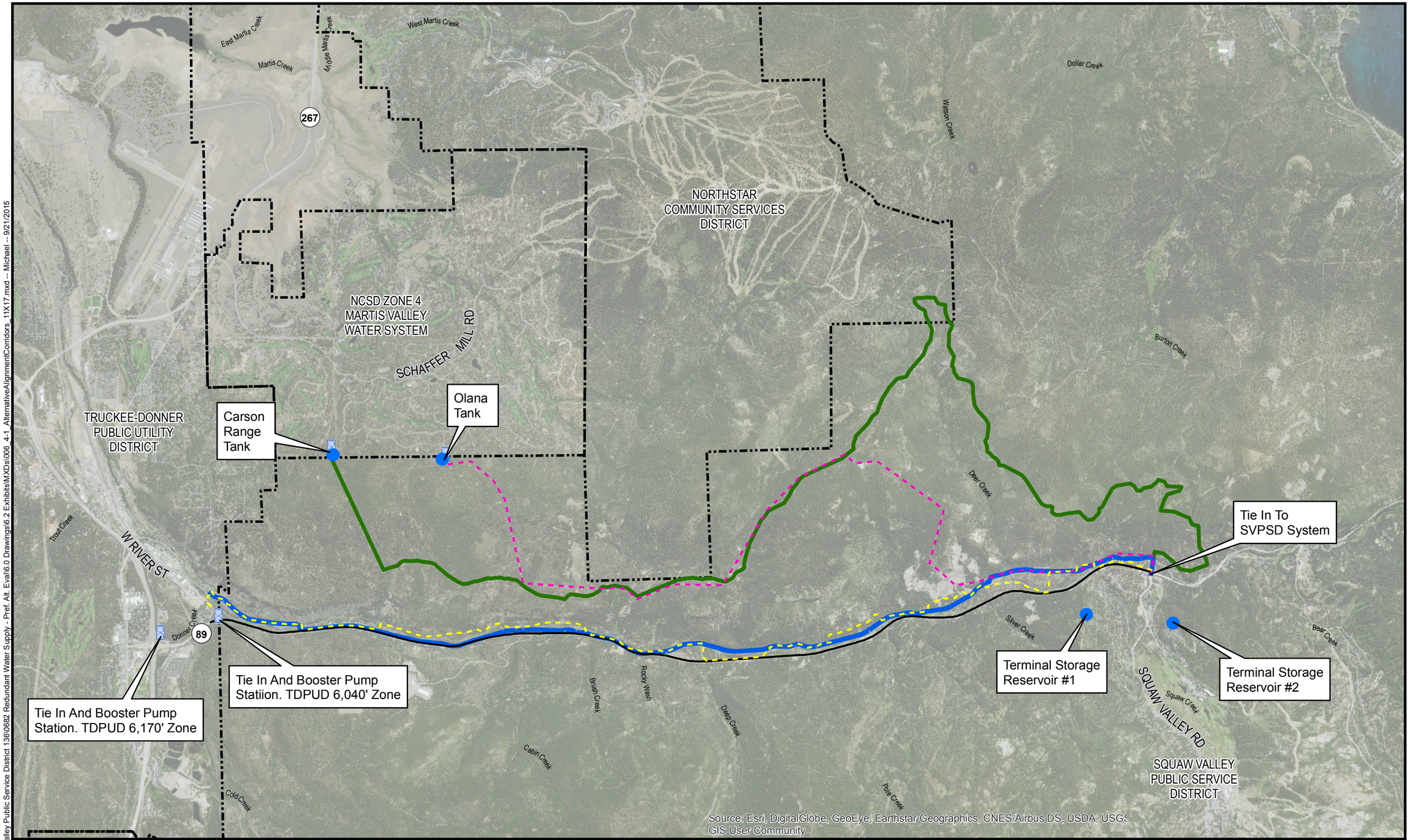
Permanent Easements

Due to the importance of easements, the probability of obtaining an easement becomes "Critical" to the feasibility of a tank site. Public entities, federal or state, are typically considered preferable to that of private land owners since they commonly deal in the granting of easements as opposed to private land owners. An existing easement is also preferred as it sets a precedent for this project to obtain an easement as well. Tank sites that are tied to the acquisition of a private easement will rank lower than those which do not.

Temporary Construction Easements

Temporary construction easements will be required to account for materials staging and equipment access during construction. It is not feasible to require a contractor to stay within the footprint of the permanent easement as the permanent width is sized for long term operation and maintenance activities. This evaluation will prioritize the type of owner, public or private, with whom the

easement is secured and will reward a shorter length of temporary easement over a longer one. This subcriterion carries “Less Important” weight in the overall evaluation due to the fact that all tank site alternatives will likely be equally scored in this category.



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LEGEND

- Storage Reservoir
- Booster Pump Station
- Bike Path Alignment
- Powerline Alignment
- USFS 06 Alignment
- Highway 89 Alignment
- TTSA TRI Alignment
- Water Purveyor Boundary

0 2,000 4,000 Feet

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SQUAW VALLEY PUBLIC SERVICE DISTRICT

REDUNDANT WATER SUPPLY - PREFERRED ALTERNATIVE EVALUATION PROJECT
PHASE 3 - FEASIBILITY STUDY UPDATE

SHEET TITLE:
ALTERNATIVE
ALIGNMENT CORRIDORS

FIGURE NUMBER:
4-1

P:\Client Projects\Squaw Valley Public Service District 136\0682 Redundant Water Supply - Pref. Alt. Eval\6.0 Drawings\6.2 Exhibits\MXDs\004_3-2_ExistingWells_PossibleLocations(ALT)_11X17.mxd -- Michael -- 10/19/2015

Trout Creek
Donner Creek
Cold Creek
Cabin Creek
Brush Creek
Rocky Wash
Martis Creek
East Martis Creek
West Martis Creek
Middle Martis Creek
Martis Camp Creek

80
89
267

Schaffer Mill #1
Schaffer Mill #4
Schaffer Mill #3
Lahontan Irrigation #1
Lahontan Irrigation #2
Lahontan #1
Lahontan #2
Martis Camp Irrigation #1
Siller Ranch #1
Martis Camp Irrigation #2

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- Well Locations
- Water Purveyor Boundary
- Martis Valley Groundwater Basin

Potential Well Areas

- A
- B
- C
- D

0 1,000 2,000 Feet

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SQUAW VALLEY PUBLIC SERVICE DISTRICT

REDUNDANT WATER SUPPLY - PREFERRED ALTERNATIVE EVALUATION PROJECT
PHASE 3 - FEASIBILITY STUDY UPDATE

SHEET TITLE: EXISTING MVGB WELLS AND POSSIBLE PRODUCTION WELL LOCATIONS

FIGURE NUMBER: 3-2

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TECHNICAL MEMORANDUM

SQUAW VALLEY PUBLIC SERVICE DISTRICT

REDUNDANT WATER SUPPLY – PREFERRED ALTERNATIVE EVALUATION PROJECT PHASE 3 – PREFERRED ALTERNATIVE EVALUATION

Prepared For: Mike Geary, P.E., General Manager

Prepared By: David Hunt, P.E.
Lucas Tipton, P.E.

Reviewed By: Matt Van Dyne, P.E.

Date: December 8, 2015

Subject: **Technical Memorandum No. 2– Alternatives Evaluation**

1.0 PURPOSE

The purpose of this technical memorandum (TM) is to present the results of the water supply, transmission, storage, and pumping alternatives evaluation and ultimately identify preferred project alternatives. The selected project alternatives will be determined based on a series of criteria and metrics used to rank the alternatives. The selected alternatives will be carried forward for detailed analysis during future predesign activities and eventually be incorporated into a formal project description as part of the environmental review process.

2.0 BACKGROUND

This TM is one part of a Summary Memorandum that will be completed for the Redundant Water Supply – Preferred Alternative Evaluation Project (Project). The Summary Memorandum will include the flowing TMs:

- TM No. 1 - Evaluation Criteria and Alternatives Evaluation Approach
- TM No. 2 - Alternatives Evaluation
- TM No. 3 - Project Description

Alternatives for the Project were identified in the Phase 3 – Feasibility Study Update (November 10, 2015). This report includes water supply alternatives for water source, transmission pipeline, booster pumping, and a terminal water storage tank in Olympic Valley. A discussion of the development of evaluation criteria, subcriteria, and metrics used in this evaluation are presented

in TM No. 1 - Evaluation Criteria and Alternatives Evaluation Approach (October 19, 2015). The project team and District staff held a workshop on October 9, 2015 to finalize the evaluation criteria and matrix weighting. The evaluation criteria are used in TM No. 2 to provide a non-economic evaluation of the proposed Project alternatives. The results from the non-economic evaluation will be used in conjunction with a cost based analysis to determine the preferred project alternatives.

The project team submitted preliminary non-economic evaluation results to the District and conducted a workshop on November 16, 2015 to discuss the results. The preliminary results were also presented to the Board on November 17, 2015.

3.0 SUMMARY

Tables 1 through 3 provide a summary of the non-economic matrix evaluation results as well as the planning level cost estimates for each project component and alternative. The preferred project alternatives are based on these results, but due to the complexity of, and the time span involved with the Project, there is the potential that various elements may change over time, with additional or new information becoming available. Future changes have the potential to alter the scores of the alternatives relative to one another or alter the relative costs of the alternatives. The alternative rankings and the alternative differential costs have been provided separately in order to offer the District information to be able to assess the effects of changes, both now and into the future.

3.1 TRANSMISSION MAIN

Based on the evaluation results, the preferred transmission main alignment is along the east or west shoulder of Highway 89. The transmission main alignment evaluation results are summarized in **Table 1**. Although the estimated cost for the Tahoe Truckee Sanitation Agency Truckee River Interceptor (TTSA TRI or TRI) alignment is slightly lower than the Highway 89 alternatives, the non-economic criteria score for the Highway 89 alignments outweighs the small difference in cost. Also, the higher environmental permitting requirements for the TTSA TRI alternative will likely exceed the difference in estimated construction costs. Details of this evaluation are presented in more detail in Section 4.1.

Table 1 – Transmission Main Evaluation Results

Alternative	Rank	Score	Cost Estimate ($M)
Hwy 89 West Shoulder	1	92.1	$13.7
Hwy 89 East Shoulder	2	89.9	$13.6
Placer County Bike Path	3	63.2	$16.3
TTSA TRI	4	57.8	$13.1

3.2 WATER SOURCE

The evaluation results for the water source are presented in **Table 2**. The water source alternatives presented in the table are for *new water source locations* only, and does not include the potential

for the District to secure water from an existing source from Truckee Donner Public Utilities District (TDPUD) and/or the Northstar Community Services District (NCSD).

The *preferred* alternative water source for the District's redundant water supply (RWS) demands is to develop an intertie agreement with the TDPUD and/or the NCSD to utilize excess capacity in lieu of a new well. This satisfies the intent and goal of the District's RWS need, and eliminates the high capital costs associated with a new source, as well as the long term operation and maintenance (O&M) and depreciation costs. Negotiations with these agencies will be an important next step to determine the actual RWS source.

If negotiating an intertie agreement with TDPUD and/or NCSD proves unsuccessful, then the District will have to develop a new groundwater source. In this case, the preferred water source would be developed in Area A (near the Truckee Airport and Schaffer Mill Road). Details of this evaluation are presented in more detail in Section 4.2.

Table 2 – Water Source Evaluation Results

Alternative	Rank	Score	Cost Estimate ($M)
Area A	1	91.7	$1.15
Zone 4	2	80.3	$1.15
Area B	3	76.2	$1.15
Area D	4	59.7	$1.15
Area C	5	57.6	$1.15

3.3 WATER STORAGE TANK

The evaluation results for the terminal water storage tank are presented in **Table 3**. The preferred water storage tank location is on APN 096-290-051, a USFS parcel south of the District administration building and just east of Sierra Crest Trail. Details of this evaluation are presented in more detail in Section 4.3.

Table 3 – Storage Tank Evaluation Results

Alternative	Rank	Score	Cost Estimate ($M)
APN 096-290-051 (USFS Property)	1	94.1	$1.54
APN 096-230-041 (Poulsen Property)	2	79.7	$1.48

3.4 BOOSTER PUMP STATION

A booster pump station will be required to transmit water from the Truckee area to Olympic Valley. It is likely that the District's RWS will pick up water from the TDPUD system at some point within their 6,170 foot or 6,040 foot tank zones. The preferred *location* of the booster pump station has not been evaluated at this stage of the project. There are a number of tasks to be completed in future phases of the Project that are necessary to make this determination, including, but not limited to; the specific location of the pipeline (east or west shoulder of Highway 89),

negotiation of an intertie or wheeling agreement with TDPUD, and a detailed understanding of the operation and hydraulics of the TDPUD system. The *preferred booster pump station alternative* would be to connect to TDPUD's 6,170 foot pressure zone, which may provide the hydraulic grade required to allow for the booster pump station to be located near Squaw Valley. Further discussion of this evaluation is presented in Section 4.4.

4.0 ALTERNATIVES EVALUATION

The detailed evaluation of project alternatives includes both non-economic and economic components. The evaluation approach, as well as the criteria and subcriteria used to perform the evaluation, was presented in TM #1 – Evaluation Criteria and Alternatives Evaluation Approach (October 19, 2015).

This section includes the evaluation of Project alternatives. The main objective of this evaluation is to compare and rank the component alternatives, evaluate the non-economic and economic impacts, and to identify the recommended preferred alternative(s) for the purpose of moving forward with preliminary design and environmental permitting. The purpose of the non-economic evaluation is to assess the alternatives with respect to a common set of evaluation criteria without specific consideration given to Project costs.

After the alternatives were ranked with respect to their non-economic advantages and disadvantages, comparative costs were estimated for each alternative relative to the highest ranked alternative in the non-economic evaluation. The comparative costs were then used to determine whether the cost differential was significant enough to alter the recommendation of the proposed alternative(s). For example, if the second highest ranked alternative pipeline alignment is much less costly, it would be important to consider the possibility of potential savings when recommending the proposed alignment.

The comparative costs are solely intended to compare the difference in costs between each alternative and are based on preliminary quantities and preliminary unit cost estimates. The level of detail for these cost comparisons are less than those in the overall opinion of Project cost, which will be further developed during the preliminary design and permitting phases of the Project. The comparative costs do not include a contingency nor do they include engineering and administrative, acquisition of land and easements, and permitting costs, which would be applied to the total Project cost. Since those costs are typically dependent on the overall Project construction costs and would further skew the results, they were intentionally omitted from the comparative costs.

4.1 TRANSMISSION MAIN

In this section, the transmission main alignment alternatives are evaluated. The non-economic detailed evaluation includes a table summarizing the alternative scores for each criterion and the overall score for each alternative. In an effort to facilitate the use of this TM for a wide range of readers, a thorough compilation of the detailed matrix evaluation has not been included in the body

of this report. Instead, the comprehensive matrix evaluation spreadsheet and specific rationale for the ranking process is provided in Appendix A.

Transmission main alignment alternatives evaluated in this section are presented below and shown in Figure 1.

The Highway 89 alignments, both east and west shoulders, are generally within the paved shoulder sections of the highway. The Placer County Bike Path (BP) and TTSA TRI alignments are primarily located off-road, with some sections of paved private driveway areas along the TRI alignment.

Transmission Main Alignment Alternatives – Highway 89 Corridor

- CT1 - Highway 89 West shoulder
- CT2 - Highway 89 East Shoulder
- BP - Placer County Bike Path alignment
- TRI - TTSA TRI alignment

4.1.1. NON-ECONOMIC EVALUATION

Table 4 summarizes the matrix scores for each criterion and gives the overall score for each alternative. Also included in this section is a summary description of the rationale used to develop the matrix scores.

Table 4 – Transmission Main Non Economic Evaluation Results

Results Summary - Transmission Main						
Criteria	**Weight**	**Priority**	**CT1**	**CT2**	**TRI**	**BP**
			Score	**Score**	**Score**	**Score**
Operations and Maintenance	7.5	21.4%	17.3	17.0	13.1	12.2
Engineering	10	28.6%	26.9	27.0	14.7	16.1
Public and Regional Impacts	5	14.3%	13.2	13.2	11.1	8.8
Environmental	7.5	21.4%	20.5	18.4	14.8	15.6
Right-of-Way Requirements	5	14.3%	14.3	14.3	4.0	10.5
Total	**35**	**100.0%**	**92.1**	**89.9**	**57.8**	**63.2**

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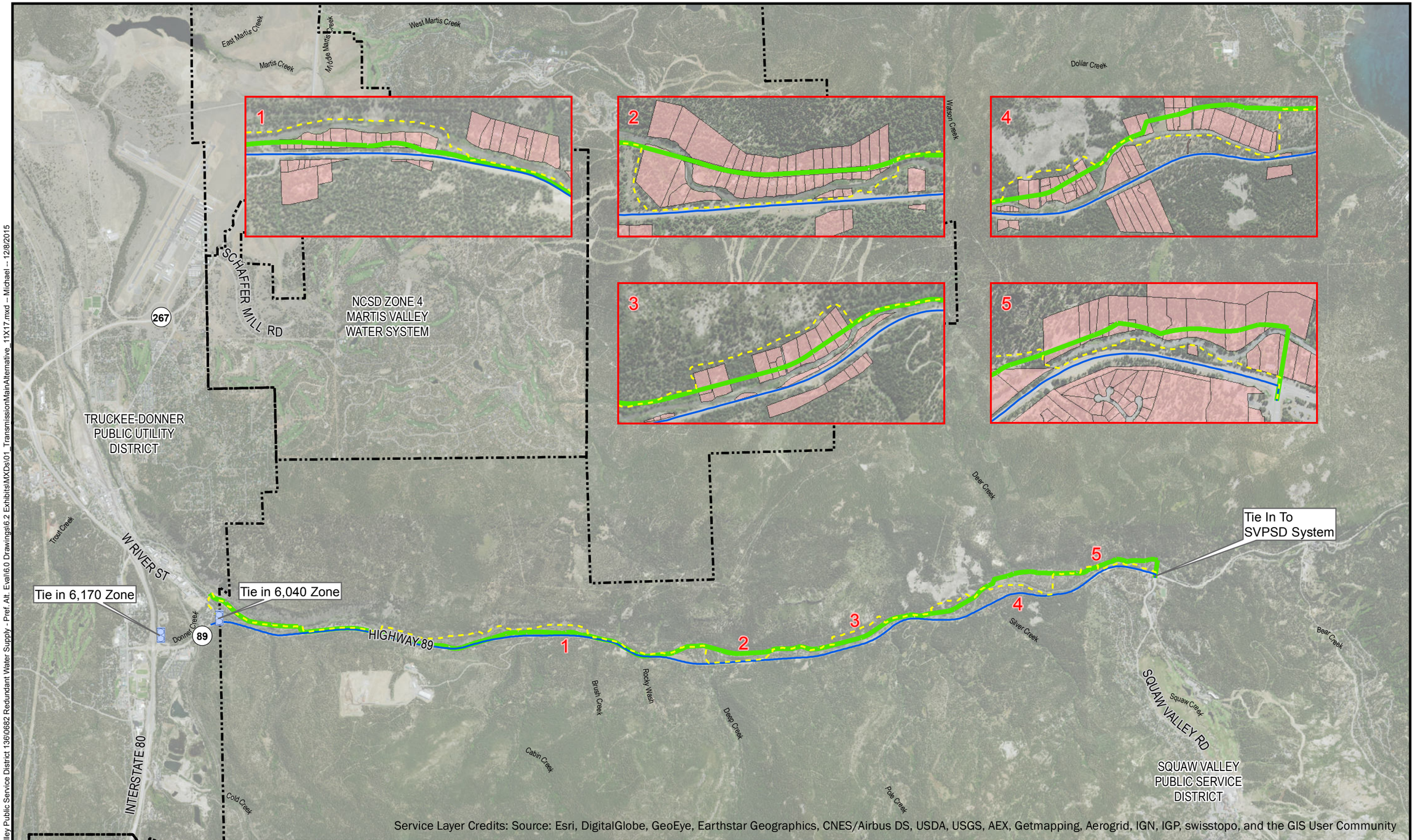

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LEGEND

- Booster Pump Station
- Bike Path Alignment
- Highway 89 Alignment (East & West Shoulder)
- TTSA TRI Alignment
- Water Purveyor Boundary
- Private Parcels

0 2,000 4,000 Feet

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REDUNDANT WATER SUPPLY - PREFERRED ALTERNATIVE EVALUATION PROJECT
PHASE 3 - ALTERNATIVES EVALUATION

SHEET TITLE: TRANSMISSION MAIN ALTERNATIVES

FIGURE NUMBER: 1

A. Operations & Maintenance

The O&M of transmission mains are a significant consideration in the overall project evaluation and preliminary design. Only certain operational subcriteria are pertinent to a comparative evaluation of alternative transmission main alignments and ultimately the selection of the most preferable alignment. This criterion evaluates for each alternative the level of operator attention, accessibility, impacts from repair and maintenance, agency coordination and permitting requirements, and potential impacts from natural disasters (fire and flooding).

The Caltrans Highway 89 right of way alignments scored the highest under the O&M criterion. Although slightly less in length than the off road alternatives (TRI and BP), the Highway 89 alignments do include more than 60 creek and culvert crossings along the length of the alignments. The effect of this is a number of air release and/or blow-off valves necessary to accommodate the crossing, and thus more appurtenances for District staff to maintain.

Accessibility to the Highway 89 pipeline outscores the other alternatives due to its easy paved access from the highway as well as accessibility by any maintenance vehicle type.

The Highway 89 alignment did score lower than the off road alternatives under the Impacts from Repair and Maintenance subcriterion. Since the majority of the pipeline would be installed within the asphalt paving, repair and maintenance activities would require asphalt replacement, traffic control and would have a higher potential to impact pedestrians and the public. Under Agency Coordination and Permitting, the Highway 89 alignments would pose minimal risk to existing infrastructure as well as interference with other utilities.

Finally, the potential impacts from natural disaster are much less likely in the Highway 89 right of way. This includes limited impacts from flooding (less length of pipeline within the 100-year flood zone), as well as minimal impacts from landslides, stream bank erosion, and fire.

B. Engineering

The engineering criterion considers the potential ease of design and construction relative to the geology (soils), regulatory compliance, topography, accessibility and work conditions along the alternative alignments. If alternative corridors contain steep, rugged slopes, rock outcroppings, retaining walls, or major obstacles, special construction methods will likely be necessary which will increase construction costs and make for difficult work conditions. This criterion evaluates for each alternative constructability, geotechnical constraints, accessibility, impacts to existing facilities, compliance with State Water Resources Control Board (SWRCB) drinking water regulations, and design within flood plains.

Under the Engineering criterion, the Highway 89 alignments ranked higher than the off-road alternatives for every subcriteria except traffic control and jack and bore construction requirements under the Constructability subcriterion. Specifically, Caltrans has indicated that they require directional drilling or jack and bore construction under all highway culvert and creek crossings. There are more than 60 such crossings within the Highway 89 right of way. It is anticipated, although, that Caltrans will only require special construction under their deeper, large diameter culverts, as well as the seven stream crossings**.** All work in the highway corridor is expected to have stringent full time traffic control requirements as compared to the off road alternatives.

C. Public and Regional Impacts

This criterion acknowledges the potential aesthetic impacts to the public as well as regional benefits associated with the project. This criterion attempts to evaluate the potential for public opposition as it relates to construction related activities, aesthetic impacts, the potential for regional benefits, and the dependence on local agencies including, but not limited to, TDPUD, NCSD, Placer County, TTSA, Caltrans, and the USFS.

Although it is important to acknowledge the political sensitivity and concerns of the general public throughout the Truckee area, these will continue to be mitigated throughout the project through public outreach and education. Therefore, political sensitivity and public perception issues are not considered as evaluation criteria at this phase of the project.

The Highway 89 alignment alternatives scored slightly higher than the off-road alternatives under most of the subcriteria in this category except for the consideration to traffic, noise, and air quality impacts under the Potential for Opposition subcriterion.

Construction of a transmission main along the Highway 89 corridor has the potential to provide a number of regional benefits. This includes installation of fire hydrants for fire protection, a potential potable water source to residences along the Truckee River canyon, as well as the potential benefit of joint utilities installed alongside the pipeline (fiber optic, cable, telephone, and natural gas). The potential for increased fire protection and potable water supply are noticeable for all alternatives. But, the location of the pipeline will dictate the difficulty in constructing these appurtenances. For example, a pipeline along the shoulder of Highway 89 would require perpendicular crossings to run water service laterals and fire hydrants to the opposite shoulder which is less preferable to a pipeline alignment which runs adjacent to multiple private residences.

D. Environmental

Alternatives that require environmental permits and approvals such as Clean Water Act permits and California Environmental Quality Act (CEQA) compliance and National Environmental Policy Act (NEPA) compliance have the potential to significantly increase project costs and schedule. These permits can directly impact the viability of a project should the permits become impossible to obtain, or if the environmental mitigations become prohibitively costly or unreasonable. Within the Environmental criterion the overall level of approval difficulty, the potential to trigger NEPA compliance, the potential costs of obtaining individual permits, and the costs for mitigation measures anticipated for each alternative corridor are assessed. The alternative with the highest score for this criterion will be the alternative that has been assessed to have the least environmental impact, and the least difficult and least costly to take through the environmental permitting and CEQA, and NEPA processes.

The Highway 89 alternatives ranked higher than the other two off-road alternatives under the environmental criterion in almost every subcriterion evaluated. The exceptions to this were: number of stream crossings, impacts within Caltrans ROW, proximity of private property owners, and potential air quality and greenhouse gas impacts. The west shoulder of Highway 89 ranked higher than the east shoulder in most cases due to the fewer number of private properties impacted and being further away from the Truckee River.

Due to the previously disturbed nature of Highway 89, both Highway 89 alignments had fewer environmental factors that would be impacted or triggered than the undisturbed or vegetated/forested areas of the Bike Path and TTSA TRI alignments. While the Highway 89 alternatives have more stream crossings, there are existing culverts that decreases the amount of permitting or mitigation that would be associated with them. This is compared to the Bike Path and TTSA TRI alternatives which require more crossings of the Truckee River, which would likely trigger additional permitting and costs. Crossing USFS land was found to be the biggest constraint for the TTSA TRI and Bike Path alternatives since they would require a Special Use permit that would trigger NEPA compliance.

Subcriterion associated with construction within highway ROW have a lower permitting cost associated with them since they can generally be evaluated and mitigated within the CEQA process. The Bike Path and TRI alternatives ranked higher under these subcriterion because they would have less of an impact to highway traffic and would likely be able to be constructed in less time based on Caltrans permit requirements, which would cause less air quality emissions.

E. Right of Way Requirements

Right of way (ROW) is an important criterion in determining the most feasible alternative alignment. By locating the corridor in Public ROW, it potentially reduces the environmental impacts, property owner opposition, and project costs. The required land acquisition and associated costs are also reduced by staying within public ROW or existing PUE's eliminating the need to purchase permanent easements. The acquisition of temporary construction easements is included as a subcriterion for the following reasons: construction easements in public ROW are deemed more probable, and some alignments would require construction easements through private property.

The Caltrans and Placer County Bike Path alignments would not require private easement acquisition as they are within the Highway 89 rights of way and/or USFS lands. Portions of the TTSA TRI alignment run directly through private property, including home sites and private driveways or access roads. Caltrans has expressed their willingness to permit a waterline project within their ROW, subject to the terms and conditions of their encroachment permit. Construction within the USFS lands would trigger NEPA, require a special use permit, and would need justification that the USFS corridor was the preferred alignment without consideration to cost or convenience. The need to acquire private easements would be the most costly and difficult to obtain.

4.1.2. COST COMPARISON

The comparative construction costs for each transmission main alternative are summarized in **Table 5**. Detailed planning level construction cost estimates for each pipeline alternative are provided in Appendix B.

Table 5 – Transmission Main Comparative Costs

Alternative	Rank	Score	Comparative Cost ($M)	Differential ($M)
Hwy 89 West Shoulder	1	92.1	$13.7	$0.0
Hwy 89 East Shoulder	2	89.9	$13.6	$-0.1
Placer County Bike Path	3	63.2	$16.3	$2.6
TTSA TRI	4	57.8	$13.1	$-0.6

The highest ranking alternatives in the non-economic evaluation were the west and east shoulder of Highway 89 alignments and both alignments have comparable construction costs of approximately $13,700,000. The Highway 89 corridor is a previously disturbed corridor which is amenable to any type of construction activity, however the corridor also has significant costs associated with pavement replacement and traffic control provisions. Both alignments project approximately 3 miles of pipeline installation in the unpaved shoulder and that half of the existing culverts can be crossed using standard construction methods. The primary reason for the difference in construction costs between the two alignments was the volume of rock excavation required. The west shoulder was determined to have a larger quantity of rock due to it being a cut slope and the east shoulder being constructed in a fill slope. The geotechnical investigation during preliminary design will provide a more precise estimation for both highway shoulders. Quantities and unit prices were derived from GIS data, preliminary negotiations with Caltrans, Caltrans construction cost databases, and similar project bid results and regional contractor opinions of probable costs.

The two alignment alternatives along the Truckee River corridor, the TTSA TRI and the Placer County Bike Path resulted in the lowest and highest construction cost estimates, respectively. Contributing to an estimated cost of $16,300,000, the Bike Path alignment has significant need for retaining walls, rock excavation and provisions for construction access limitations. The TTSA TRI alignment has the lowest estimated construction cost at $13,100,000, due to its limited need for expensive pavement replacement, retaining walls or traffic control.

With a price differential of less than 5 percent to that of the Highway 89 alternatives, the results of the non-economic evaluation should outweigh the cost savings identified in this analysis.

4.1.3. RECOMMENDED TRANSMISSION MAIN ALTERNATIVE

The recommended preferred transmission main alignment is the west or east shoulder of Highway 89, with overall normalized scores of 92.1 and 89.9, respectively. Although the comparative construction cost estimate for the TTSA TRI alignment is approximately $600,000 less than the east and west shoulder of Highway 89, the Highway 89 alternatives best meet the non-economic pipeline alignment goals and considerations. Also, it is estimated that the required environmental permitting (CEQA/NEPA) and private property easement acquisitions associated with the TTSA

TRI alignment will likely far exceed these same costs associated with the Highway 89 alignments, therefore the total Project cost is likely to be higher for the TTSA TRI alignment.

The actual alignment within the Caltrans Highway 89 ROW will be determined in subsequent phases of the Project and be based on preliminary design activities including detailed field survey and geotechnical investigations.

4.2 NEW WATER SOURCE

In this section, new water source alternatives are evaluated. This evaluation assesses new water source locations only and is secondary to the preferred source alternative which would be negotiating a water supply agreement with TCPUD and/or NCSD for available excess capacity in their system(s).

The non-economic detailed evaluation includes a table summarizing the alternative scores for each criterion and the overall score for each alternative. The comprehensive matrix evaluation spreadsheet and specific rationale for the ranking process is provided in Appendix C.

New source alternatives evaluated in this section are presented below and shown in Figure 2.

New Water Source Alternatives

- Area of Interest A (area near Truckee Airport and Schaffer Mill Road)
- Area of Interest B (vicinity of Donner Creek and the mouse hole along Highway 89)
- Areas of Interest C and D (southwest portion of the MVGB)
- New well in Zone 4 area (Martis Camp Water System)

Trout Creek
Northside Well
TRUCKEE-DONNER
PUBLIC UTILITY
DISTRICT
Martis Valley Well #1
80
Donner Creek
Donner Creek Well
AREA B
WEST RIVER STREET
89
Airport Well #1
Schaffer Mill #1
SCHAFFER MILL RD
AREA A
267
Cold Creek
AREA C
Schaffer Mill #4
Schaffer Mill #3
Lahontan Irrigation #1
Lahontan Irrigation #2
Lahontan #1
Lahontan #2
Martis Creek
East Martis Creek
TH #3
TH #2
Martis Camp Creek
NCSD ZONE 4
MARTIS VALLEY
WATER SYSTEM
89
USFS 06 RD
Martis Camp
Irrigation #1
Siller Ranch #1
Martis Camp
Irrigation #2
SCHAFFER MILL RD
267
Cabin Creek
AREA D
NORTHSTAR
COMMUNITY
SERVICES DISTRICT
Middle Martis Creek
Brush Creek
West Martis Creek
Rocky Wash
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- Existing Well Locations
- Water Purveyor Boundary
- Martis Valley Groundwater Basin

Potential Well Areas

- A
- B
- C
- D

0 1,000 2,000 Feet

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SQUAW VALLEY PUBLIC SERVICE DISTRICT

REDUNDANT WATER SUPPLY - PREFERRED ALTERNATIVE EVALUATION PROJECT
PHASE 3 - ALTERNATIVES EVALUATION

SHEET TITLE: NEW WATER SOURCE ALTERNATIVES

FIGURE NUMBER: 2

P:\Client Projects\Squaw Valley Public Service District 1360682 Redundant Water Supply - Pref. Alt. Eval\6.0 Drawings\6.2 Exhibits\MXDs\02_NewWaterSourceAlternatives_11X17.mxd -- Michael -- 12/8/2015

4.2.1. NON-ECONOMIC EVALUATION

Table 6 summarizes the matrix scores for each criterion and gives the overall score for each alternative. Also included is a summary description of the rationale used to develop the matrix scores.

Table 6 – New Water Source Non Economic Evaluation Results

Results Summary - Water Source							
Criteria	**Weight**	**Priority**	**A**	**B**	**C**	**D**	**Zone 4**
			Score	**Score**	**Score**	**Score**	**Score**
Subsurface Conditions	10	16.0%	14.5	13.7	6.2	8.6	13.4
Surface Conditions	7.5	12.0%	9.6	5.3	8.9	9.1	9.9
Water Quality	10	16.0%	14.4	11.4	8.6	8.6	15.1
Environmental	7.5	12.0%	9.7	10.2	9.2	8.7	7.5
Political and Public Impacts	5	8.0%	7.5	7.6	5.7	5.7	5.7
Right-of-Way Requirements	5	8.0%	8.0	6.8	5.7	5.7	4.2
Operations and Maintenance	7.5	12.0%	12.0	7.8	6.3	6.3	10.8
Engineering	10	16.0%	16.0	13.4	7.0	7.0	13.7
Total	**62.5**	**100.0%**	**91.7**	**76.2**	**57.6**	**59.7**	**80.3**

A. Subsurface Conditions

The performance and reliability of any underground drinking water source is highly dependent on a variety of subsurface conditions. This criterion includes known water quality, anticipated depth-to-water and depth of future wells, considerations based on the geologic material likely to be encountered by production wells in each zone, the need for an exploratory drilling program, anticipated yield, and additional considerations based on current use of the aquifer and groundwater level trends.

Area A scored the highest of all zones due to many factors. Area A is not expected to require an exploratory drilling program due to the favorable subsurface geology reported on the well log of the TDPUD Brockway well and the TDPUD Airport Well, the latter of which has been pumped in excess of 3,000 gpm. The previously mentioned wells were drilled through a mixture of volcanic rocks and alluvium (sand, gravel, clay) that both provide water to the wells and do not necessitate special testing for hard-rock aquifers and reduced well yields per Title 22 of the California Waterworks Standards. Area A is removed from, and exhibits lower well density than much of Zone 4 and adjacent Areas C and D. Groundwater quality from Zone A is known from the Airport Well, which reduces uncertainty in regards to the chemical characteristics of the source.

B. Surface Conditions

While many of the subsurface conditions are difficult to assess without extensive testing, surface conditions are more readily able to be evaluated. This criterion has three subcriteria, including

proximity to springs and/or other surface water features, proximity to private or public wells, and the distance from sources of possible groundwater contamination.

Zone 4 scored slightly higher for surface conditions than did Area A, though the difference is small. Zone 4 is reasonably removed from many surface water features; however, possible capture of Martis Creek flow is conceivable if the well is placed in proximity to the stream. In terms of possible stream capture and compliance with the Truckee River Operating Agreement and the spirit of the Martis Valley Groundwater Management Plan, Area A outscored Zone 4 due to its distance from surface water features. Areas for potential wells sites in both Zone 4 and Area A are outside of any recognized flood zone and rank equally. Neither Zone 4 nor Area A are near locations where individual homes are routinely served by domestic wells, and therefore impacts to private wells are unlikely.

The major difference between Zone 4 and Area A occurs when contrasting known water quality, or factors that could affect water quality in the future. Water quality reported for the Zone 4 wells meets all water quality standards and potential contaminant sources are generally limited to sewer collection facilities, a few recreational facilities, and low density housing. Water quality reported for the Airport Well near Area A is very near the MCL for arsenic (10 µg/L), with concentrations reported above 9.0 µg/L. Area A was outscored by Zone 4 due to the location's proximity to moderate density commercial/ housing complexes, a gas station, Highway 267, and other potential contaminant sources associated with the airport and the storage and transport of aviation fuel.

C. Water Quality

The District currently provides groundwater to its customers which is non-chlorinated and of excellent quality. Current water treatment in District sources includes the addition of sodium hydroxide for pH adjustment and corrosion control. This criterion evaluates well locations based on water quality compared to Squaw Valley, and the potential level of water treatment required.

A new source location in the Zone 4 area slightly outranked that of Area A for the water quality criterion; both outranking the other three alternatives evaluated. This is primarily due to the know water quality in the NCSD Zone 4 potable water wells. These wells meet state and federal primary and secondary drinking water standards. Area A is in close proximity to TDPUD's Airport Well and meets the primary drinking water standard for arsenic (9+ µg/L), but is close to the federal maximum contaminant level (MCL) of 10 µg/L. Wells in the Zone 4 area are shown to have arsenic concentrations of less than 5 µg/L. Areas C and D ranked lower than the other alternatives due to the unknown water quality in areas in and around USFS lands. Area B is located adjacent to Sierra College and West River Rd. TDPUD operates two wells near this area; the Northside well with an arsenic concentration that exceeds the MCL, and the Donner Creek well which is adjacent to Donner Creek and requires surface water treatment to be considered a potable water supply.

This criterion also evaluated the potential level of water treatment required, namely pH control, chlorination, and treatment for iron and manganese. All sources appear to meet the MCL for iron and manganese, with the exception of Areas C and D where the water quality is unknown. The level of pH adjustment for corrosion control will depend specifically on the water quality at the point of connection to the TDPUD system. Any source that will be wheeled through the NCSD

or TDPUD systems will require chlorination. It is likely that a maintenance chlorine residual will also be required between Truckee and Squaw Valley to prevent bacteriological issues in the long pipeline. This will be studied further later in the project.

D. Environmental

Any new well location may impact local waters, biological and cultural resources, and land uses by way of construction activities and the permanent presence of an underground well and a well house. Water source locations are evaluated equivalent to the pipeline evaluation discussed in Section 4.1.

Source water sites were evaluated for potential impacts by assessing the whole of the site area and the likelihood to be able to avoid impacts. Elevation of the source water, proximity and density of receptors, and quality of environment and habitat were all taken into account when scoring source water areas. Consideration of these factors ranked Area B the highest since there are disturbed areas where a well could be placed with minimal environmental permitting triggers or costs. Area A ranked a close second with Area C not too far behind. Surface environmental factors, while important for source location could likely be minimized or avoided for all source areas.

E. Public and Regional Impacts

This criterion acknowledges the potential aesthetic impacts to the public as well as regional benefits associated with the project. This criterion attempts to evaluate the potential for public opposition as it relates to construction related activities, aesthetic impacts, the potential for regional benefits, and the dependence on local agencies including, but not limited to, TDPUD, NCSD, Placer County, TTSA, Caltrans, and the USFS.

Although it is important to acknowledge the political sensitivity and concerns of the general public throughout the Truckee area, these will continue to be mitigated throughout the project through public outreach and education. Therefore, political sensitivity and public perception issues are not considered as evaluation criteria at this phase of the project.

Water source Areas A and B essentially ranked equivalent under this criterion. Alternatives that are within private property and residential corridors are given a lower score since they are more likely to receive opposition from local landowners. Area A was ranked the highest within the Potential for Opposition subcriterion, mostly due its location near Highway 267 and the airport, with negligible impacts due to the location and surrounding land use. Areas C, D and Zone 4 ranked the lowest in this case due to the potential for a well location in residential areas.

This criterion also included Potential Regional Benefits and Agency Cooperation/Dependence subcriterion. All of the potential new source locations have the potential to provide supplemental capacity and operational flexibility to the NCSD and TDPUD when the District is not pumping the full redundant water demands. Similarly, all of the source locations, with the exception of Area B, require the cooperation of NCSD and/or TCPUD for use of their infrastructure to wheel water to a District owned booster pump station. A new source in Area B provides the District the opportunity to construct an independent waterline more economically than the other areas based on its proximity to the transmission main.

F. Right of Way Requirements

The acquisition of ROW by the District for a new source location will include the purchase of land for the source itself and an easement for the linear pipeline portion which will connect the new source to existing system infrastructure. The water source alternatives are evaluated similarly to the pipeline. Source alternatives which require shorter lengths of easements with a fewer number of land owners will rank higher than those which involve more easements with more land owners.

Area A ranked the highest in this criterion. All of the alternatives are likely to require some level of private easements. It was assumed that securing a private easement in residential areas would be more expensive and less likely to obtain. For this reason, Areas C, D, and Zone 4 ranked the lowest. Area B well sites could be within the Sierra College property, or in the commercial corridor on West River Street. Area A wells would be located on private property, potentially on Airport District or DMB Highlands owned parcels. This area is currently zoned Open Space, and with no residential or commercial development allowed for this land use, it is anticipated that either property owner would be cooperative.

G. Operations and Maintenance

The O&M criterion for the new groundwater source evaluates each alternative against the accessibility of the new locations and the impacts to the public from repair and maintenance activities.

Access is the most important subcriterion under O&M. When in operation, a well site requires daily site visits by District staff, therefore, reliable and easy access is essential. Water source Area A ranked slightly higher than Zone 4 under this criterion. With respect to Accessibility, access to Areas A and B appears to be unrestricted based on its proximity to Highway 267 and Schaffer Mill Road. Access to Areas C and D is dependent upon location, but if a new well were sited on USFS land, access via Forest Service Road 06 would be considered remote.

H. Engineering

Construction challenges associated with the design and constructability of a new groundwater well have the potential to cause significant increases in project costs and/or delays in schedule. Due to the unknown nature of potential construction challenges beneath the surface, this criterion only evaluates ground level conditions/infrastructure. A well location alternative which lends itself well to accommodating well drilling equipment, well drilling materials and has an available power source will score much higher than one which does not.

Water source Area A ranked the highest under this criterion, with Areas B and Zone 4 following. Under the Constructability criterion, potential parcels within Area A are unoccupied and appear to have ample room for material staging. The other areas are located adjacent to commercial development (Area B), or residential areas and are assumed to have less open space for material staging. Access for drilling equipment is unrestricted in Areas A and Zone 4 due to their proximity to Highway 267 and Schaeffer Mill Road. Access would be more difficult if the well site was located on USFS land; therefore, Areas C and D ranked the lowest. Also, disposal of development and testing residuals and water disposal is necessary for drilling and development of a new well. Residuals management is best when sewer is located nearby and there is ample land available to

store development and testing residuals. Areas A and Zone 4 ranked highest under this subcriterion.

4.2.2. COST COMPARISON

The comparative construction costs for each new water source alternative are summarized in **Table 7**. The planning level cost estimate for a new water source is based on drilling, developing, and equipping a new water supply well. This includes drilling and testing an exploratory boring, drilling, developing and testing a new well, and construction of a well building and associated mechanical and electrical appurtenances. This cost estimate does not include acquisition of land and easements. Based on this, the planning level cost estimates for a new well are equivalent for each alternative with the information known at this time. Detailed planning level construction cost estimates for new source alternatives are provided in Appendix D.

Table 7 – New Water Source Comparative Costs

Alternative	Rank	Score	Cost Estimate ($M)	Differential ($M)
Area A	1	91.7	$1.15	$0.0
Zone 4	2	80.3	$1.15	$0.0
Area B	3	76.2	$1.15	$0.0
Area D	4	59.7	$1.15	$0.0
Area C	5	57.6	$1.15	$0.0

4.2.3. RECOMMENDED SOURCE ALTERNATIVE

The detailed evaluation of the new water source location is based upon the assumption that the District will negotiate an intertie agreement with TDPUD and/or NCSD to secure additional available water supply from those regional water systems. This would occur prior to developing a new water source. If the District is unable to reach an agreement with TDPUD and/or NCSD, then the preferred new water source alternative would be Area A.

The actual source location within Area A will be determined based on future negotiations with land owners to secure the required easements. This would be followed by exploratory drilling to assess groundwater conditions and water quality, followed by construction of a new well and piping to connect to existing conveyance infrastructure.

4.3 WATER STORAGE TANK

In this section, terminal water storage tank alternatives are evaluated. The non-economic detailed evaluation includes a table summarizing the alternative scores for each criterion and the overall score for each alternative. The comprehensive matrix evaluation spreadsheet and specific rationale for the ranking process is provided in Appendix E.

Terminal water storage tank alternatives evaluated in this section are presented below and shown in Figure 3.

Water Storage Tank Alternatives

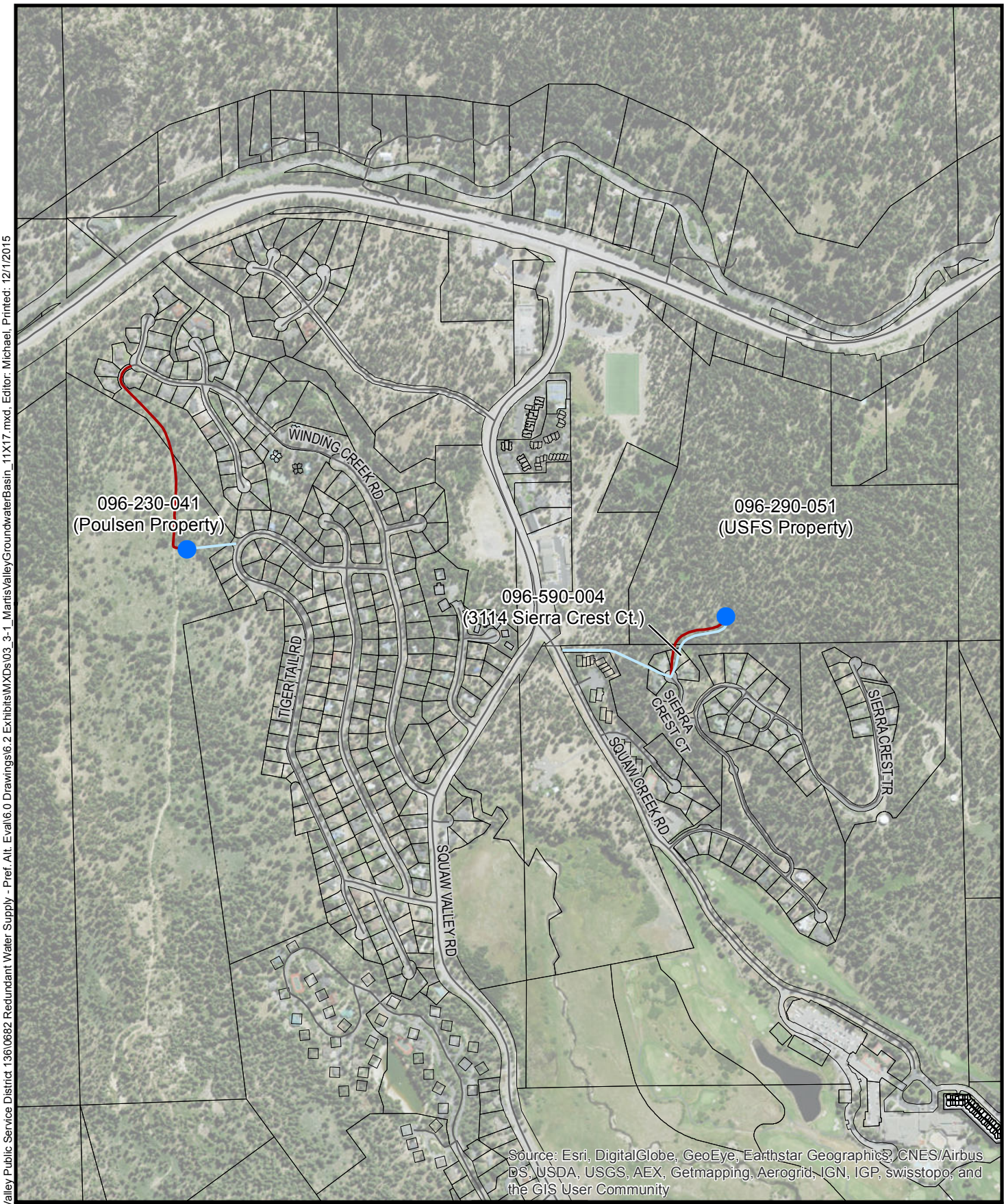
- APN 096-230-041 (Poulsen property north of Painted Rock)
- APN 096-290-051 (USFS property south of SVPSD Administration facility)

4.3.1. NON-ECONOMIC EVALUATION

Table 8 summarizes the matrix scores for each criterion and gives the overall score for each alternative. Also included is a summary description of the rationale used to develop the matrix scores.

Table 8 – Water Storage Tank Non Economic Evaluation Results

Results Summary - Water Storage Tank				
Criteria	**Weight**	**Priority**	**APN 096-230-041 (Poulsen Property)**	**APN 096-290-051 (USFS Property)**
			Score	**Score**
Operations and Maintenance	5	15.4%	11.2	15.4
Engineering	10	30.8%	23.2	27.3
Political and Public Impacts	5	15.4%	12.1	14.3
Environmental	7.5	23.0%	21.9	21.7
Right-of-Way Requirements	5	15.4%	11.3	15.4
Total	**32.5**	**100.0%**	**79.7**	**94.1**



LEGEND

- Storage Reservoir
- Access Road
- Streets
- Parcel Boundary
- Waterline

0 125 250 500 Feet

SQUAW VALLEY PUBLIC SERVICE DISTRICT

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REDUNDANT WATER SUPPLY
PREFERRED ALTERNATIVE EVALUATION PROJECT
PHASE 3 - ALTERNATIVES EVALUATION

SHEET TITLE: WATER STORAGE TANK ALTERNATIVES

FIGURE NUMBER: 3

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A. Operations & Maintenance

The O&M of the water tank is an important consideration in the overall project evaluation. Only certain operational subcriteria are pertinent to a comparative evaluation of tank locations and ultimately the selection of the most preferable site. This criterion evaluates for each alternative accessibility, impacts from repair and maintenance, and the potential impacts from natural disaster such as landslides and avalanches.

The USFS tank site ranked highest for this criterion. Both sites will be accessible from a well graded dirt road and snow removal would be required under winter conditions if accessed with a light truck. Access to the Poulsen Property site would be along an existing dirt road starting near the end of Winding Creek Rd. Access to the USFS site would begin on Sierra Crest Court, adjacent to 3114 Sierra Crest Court. The length of access road to the Poulsen tank site would be nearly twice as long as the USFS access road, and thus the USFS site ranked highest under this subcriterion. Impacts from repair and maintenance were considered equivalent for both tank sites.

Impacts from natural disaster were also evaluated. The steep uphill and less vegetated slope adjacent to the Poulsen tank site make this alterative more susceptible to landslide and avalanche damage.

B. Engineering

The engineering criterion considers the potential ease of construction relative to the geology (soils), topography, accessibility and work conditions. If alternative tank sites are located on steep slopes, special construction methods will likely be necessary which will increase construction costs and make for difficult work conditions. Specifically, this criterion evaluates constructability, accessibility, and the infrastructure requirements necessary for connection to the existing water system.

The USFS tank site ranked highest for this criterion. This is mainly due to the steep slope, extensive hillside excavation and site grading requirements for the Poulsen site. Standard construction methods are anticipated for the USFS site (i.e. at grade welded steel tank). The Poulsen site would require a large retaining wall to support the uphill slope if a welded steel tank were to be constructed. Otherwise, a partially buried precast concrete tank would be necessary.

This criterion also assessed the infrastructure required to connect to the existing water system. The Poulsen tank site is approximately 400 feet up slope from a potential connection point on Tiger Tail Road. This is the shortest distance to the existing system, but would require construction of a waterline on a steep slope. The waterline from the USFS tank site to the existing system connection point would be approximately 1,600 feet based on running a parallel pipeline from Sierra Crest Trail/Sierra Crest Court to the intersection of Squaw Creek Road and Squaw Valley Road (adjacent to the East Booster Pump station).

C. Public and Regional Impacts

This criterion acknowledges the potential aesthetic impacts to the public associated with the construction of a new water storage tank. This criterion attempts to evaluate the potential for public opposition as it relates to construction related activities, and aesthetic impacts.

The USFS site ranked higher than the Poulsen site under this criterion. This is primarily due to the potential aesthetic impacts associated with the visual impact of the tank. The heavy vegetation adjacent to the USFS site make the tank not visible, even from the adjacent residences. On the other hand, a tank on the Poulsen property would be visible from multiple vantage points in the Valley.

D. Environmental

Any new water tank location has the potential to impact biological and cultural resources and land uses by way of construction activities and the permanent presence of an above ground water storage tank. Water tank locations are evaluated equivalent to the pipeline evaluation discussed in Section 4.1.

The two tank sites ranked about the same under the environmental criterion as they will both have the same size and scale of impacts with similar potentials for permitting. The Poulsen site ranked slightly higher because it is not on USFS land and does not require USFS permitting, which would save time and requires less documentation. Additionally, the USFS is more densely forested creating the potential for the removal of more trees which would have higher mitigation costs.

In regards to cultural resources, cultural resources are known to occur in the area for both tank sites and the Washoe Tribe of Nevada and California owns property adjacent to the USFS property tank site. Due to these factors, there is a higher potential for inadvertent cultural resources or remains discoveries during construction and therefore an increased likelihood of required cultural resources monitoring during construction (archaeologist and a Native American monitor). In addition to the NEPA process, a USFS Special Use Permit (SUP) must be acquired and a USFS records search must be completed before a cultural resource survey can take place on USFS land. The process to obtain a SUP and complete a USFS records search can add to a project timeline and is a contributing factor to why the Poulsen property ranked higher

E. Right of Way Requirements

ROW acquisition is necessary for the construction of a new water storage tank. By locating the tank in public ROW, it potentially reduces the environmental impacts, property owner opposition, and project costs. The required land acquisition and associated costs are also reduced by staying within public ROW or existing PUE's eliminating the need to purchase permanent easements. The acquisition of temporary construction easements is included as a subcriterion for the following reasons: construction easements in public ROW are deemed more probable, and both tank sites would likely require construction easements through private property.

The USFS tank site ranked higher than the Poulsen site under this criterion. This is primarily due to the quantity of private land easement required. The Poulsen site would require private land easement for all components of the tank; access road, tank site, and pipeline. The USFS site would

require a small private easement for the access road within the property located at 3114 Sierra Crest Court. This property is currently owned by the Homesites at Squaw Creek Partnership and although it is zoned single family residential, it is assumed to be left as open space for access to the pond located on USFS land.

4.3.2. COST COMPARISON

The comparative construction costs for the terminal water storage tank alternatives are summarized in **Table 9**. Both alternatives estimate the construction costs of a 1,000,000 gallon welded steel water storage tank. This cost estimate does not include acquisition of land and easements. Detailed planning level construction cost estimates for each tank alternative are provided in Appendix F.

Table 9 – Water Storage Tank Non Economic Evaluation Results

Alternative	Rank	Score	Cost Estimate ($M)	Differential ($M)
APN 096-290-051 (USFS Property)	1	94.1	$1.54	$0.00
APN 096-230-041 (Poulsen Property)	2	79.7	$1.48	$-0.06

The highest ranking alternative in the non-economic evaluation was the USFS property on APN 096-29-051. The planning level cost estimates for each alternative are essentially equal. The USFS tank location will require a longer water main installation to connect to the existing system, and the Poulsen tank will require more grading and retaining walls to accommodate the steep slope on which the tank will be located. Another alternative to constructing a welded steel tank on the steep slope of the Poulsen property would be to construct a partially buried reinforced concrete tank. However, manufacturers cost estimates were 2 to 2.5 times higher than that of a welded steel tank, which would add an additional $400,000 to the Poulsen tank site.

4.3.3. RECOMMENDED WATER STORAGE TANK ALTERNATIVE

The recommended preferred terminal water storage tank location is the USFS property (APN 096-290-051). The actual location within this property will be determined based on future topographic survey and negotiations with the land owner at 3114 Sierra Crest Court to secure the necessary access road easement.

4.4 BOOSTER PUMP STATION

A booster pump station will be required to pump water from the lower elevations near Truckee to the terminal water storage tank in Squaw Valley. It is likely that the District's RWS will draw water from the TDPUD system at some point within their 6,170 foot or 6,040 foot tank zone. The preferred location of the booster pump station will be located somewhere within the Highway 89 corridor with a connection to TDPUD's 6,170 foot pressure zone, but to develop alternative sites, further evaluation is necessary.

The preferred booster pump station location was not evaluated using the matrix evaluation during this phase of the project because more information is necessary to properly evaluate, including:

- Actual location of pipeline within the Highway 89 right of way (east shoulder versus west shoulder will have a bearing on the location of the pump station);
- Negotiate water supply agreement(s) with NCSD and/or TDPUD to fully understand the point of connection;
- If negotiations for water supply from NCSD and/or TDPUD are unsuccessful, then the actual source location will play a part in location of pump station, and
- Evaluate TDPUD system hydraulics to understand if connection will occur within their 6,170 foot or 6,040 foot pressure zone.

The Squaw Valley terminal water storage tank hydraulic grade will be approximately 6,350 feet. If water can be drawn from the TDPUD 6,170 foot zone, then there may be an opportunity to site a booster pump station near Highway 89 and Squaw Valley Rd. (approximate elevation 6,100 feet). Hydraulic modeling of the TDPUD system would need to be completed to fully understand this. Currently, the TDPUD water system hydraulic model is going through a conversion, and was therefore not available to use for this analysis.

The planning level construction cost estimate to construct a booster pump station with a capacity of approximately 650 gallons per minute is approximately $1.1 million. This includes construction of a pump station building, site work, vertical turbine pumps, tie ins to the existing water system and new transmission main, and associated mechanical and electrical appurtenances. This cost estimate does not include acquisition of land and easements. Detailed planning level construction cost estimates for the booster pump station are provided in Appendix G.

5.0 RESULTS AND RECOMMENDATIONS

The primary objective of this evaluation was to recommend the preferred Project alternatives for the District's RWS Project.

Table 10 provides the preferred Project alternatives and planning level construction cost estimates based on the evaluation results. The planning level construction cost estimates do not include acquisition of land and easements.

Table 10 –Evaluation Results and Preferred Project Alternatives

Project Component	Alternative	Construction Cost Estimate ($M)
Transmission Main	Highway 89 Caltrans ROW (east or west shoulder)	$13.7
Water Source	Intertie agreement with TDPUD and/or NCSD	$0.0
Terminal Water Storage Tank	USFS Property (APN 096-290-051 (USFS Property)	$1.48
Booster Pump Station	Connection to TDPUD 6,170 foot zone	$1.1

This evaluation also presented viable alternatives to the preferred alternatives, specifically for the water source and booster pump station. These alternatives will be considered in the Project Description and during the CEQA/NEPA process.

The alternative to the water source would be considered if negotiations with TDPUD and/or NCSD for an intertie agreement are unsuccessful. The water source alternative would include drilling and developing a new well in Area A, as discussed in Section 4.2.

The booster pump station was not evaluated using the matrix criteria and method, although a preferred alternative was recommended given the data known at the time of this evaluation. The preferred alternative is connection to TDPUD's 6,170 foot tank zone. The alternative to this would be connection to TDPUD's 6,040 foot tank zone. Further evaluation of water system hydraulics, as well as future negotiation of an intertie agreement will be necessary to properly evaluate booster pump station alternatives and potential locations.

Given the data known at the time of this evaluation, it is our opinion that the preferred alternatives presented above best meets the District's intent and goals for the RWS Project and provides the District with an overall Project that is feasible and viable. This evaluation also provides the basis for development of the Project Description. The Project description will be written such that it can easily "dove-tail" into a CEQA, NEPA, or environmental permit application project description, as well as provide the District with a clear vision of the continued development of the Project.

Appendix A

Transmission Main Matrix and Scoring Rationale

APPENDIX A - NON ECONOMIC EVALUATION - TRANSMISSION MAIN

Criteria	Weight	Priority (%)	Subcriteria	Weight	Priority (%)	Subcriteria Metric	Weights	Priority (%)	Matrix Weight	ALIGNMENT ALTERNATIVES: CT1 HWY 89 West Shoulder Rank	CT1 HWY 89 West Shoulder Score	CT2 HWY 89 East Shoulder Rank	CT2 HWY 89 East Shoulder Score	TRI TTSA TRI Interceptor Rank	TRI TTSA TRI Interceptor Score	BP Placer County Bike Path Rank	BP Placer County Bike Path Score
O & M	7.5	21.4%	**Level of Operator Attention**	5	18.2 %	Number of Appurtenances that require Maintenance and Repair	10	50%	1.9	2	1.0	2	1.0	4	1.9	3	1.5
						Pipeline Length	10	50%	1.9	4	1.9	4	1.9	2	1.0	1	0.5
						Sub-total	**20**	**100%**	**3.9**		**2.9**		**2.9**		**2.9**		**1.9**
			Accessibility	7.5	27.3 %	Remote Locations	10	44%	2.6	4	2.6	4	2.6	2	1.3	1	0.6
						Paved Road v. Dirt Road	7.5	33%	1.9	4	1.9	4	1.9	1	0.5	2	1.0
						Type of Vehicle Access: Snow Cat, ATV, Light Truck, etc.	5	22%	1.3	4	1.3	4	1.3	2	0.6	2	0.6
						Sub-total	**22.5**	**100%**	**5.8**		**5.8**		**5.8**		**2.4**		**2.3**
			Impacts from Repair and Maintenance	7.5	27.3 %	Traffic Control	10	40%	2.3	2	1.2	2	1.2	4	2.3	3	1.8
						Pedestrian/Public Impacts	5	20%	1.2	2	0.6	2	0.6	4	1.2	3	0.9
						AC Repair	7.5	30%	1.8	2	0.9	2	0.9	4	1.8	3	1.3
						Revegetation/BMP's	2.5	10%	0.6	4	0.6	4	0.6	1	0.1	2	0.3
						Sub-total	**25**	**100%**	**5.8**		**3.2**		**3.2**		**5.4**		**4.2**
			Agency Coordination/Permitting	5	18.2 %	Stream Crossings	7.5	43%	1.7	3	1.3	3	1.3	1	0.4	4	1.7
						Bridge Crossings	5	29%	1.1	4	1.1	4	1.1	4	1.1	1	0.3
						Impacts to Ex. Infrastructure	2.5	14%	0.6	3	0.4	3	0.4	1	0.1	4	0.6
						Interference with Other Utilities	2.5	14%	0.6	4	0.6	4	0.6	1	0.1	2	0.3
						Sub-total	**17.5**	**100%**	**3.9**		**3.3**		**3.3**		**1.8**		**2.8**
			Impacts from Natural Disaster	2.5	9.1 %	Flooding	5	29%	0.6	4	0.6	3	0.4	1	0.1	2	0.3
						Landslides	5	29%	0.6	4	0.6	4	0.6	1	0.1	2	0.3
						Stream Bank Erosion	5	29%	0.6	4	0.6	3	0.4	1	0.1	2	0.3
						Fire	2.5	14%	0.3	4	0.3	4	0.3	2	0.1	2	0.1
						Sub-total	**17.5**	**100%**	**1.9**		**1.9**		**1.7**		**0.6**		**1.0**
			Sub-total	**27.5**	**100.0 %**				**21.4**		**17.3**		**17.0**		**13.1**		**12.2**
Engineering	10	28.6%	**Constructability**	10	30.8 %	Standard v. Non-Standard Methods	10	24%	2.1	4	2.1	4	2.1	4	2.1	4	2.1
						Material Staging	10	24%	2.1	4	2.1	4	2.1	2	1.0	2	1.0
						Construction Vehicle Access	7.5	18%	1.6	4	1.6	4	1.6	2	0.8	2	0.8
						Jack and Bore	5	12%	1.0	2	0.5	2	0.5	3	0.8	4	1.0
						Bridge Crossings	5	12%	1.0	4	1.0	4	1.0	4	1.0	1	0.3
						Traffic Control	5	12%	1.0	2	0.5	2	0.5	4	1.0	4	1.0
						Sub-total	**42.5**	**100%**	**8.8**		**7.8**		**7.8**		**6.7**		**6.2**
			Geotechnical Constraints	7.5	23.1 %	# of Retaining Walls	10	40%	2.6	4	2.6	4	2.6	2	1.3	1	0.7
						Trench Integrity	5	20%	1.3	4	1.3	4	1.3	1	0.3	2	0.7
						Reuse of spoils for backfill	5	20%	1.3	3	1.0	4	1.3	3	1.0	3	1.0
						Rock Excavation	5	20%	1.3	3	1.0	4	1.3	3	1.0	3	1.0
						Sub-total	**25**	**100%**	**6.6**		**5.9**		**6.6**		**3.6**		**3.3**
			Accessibility	5	15.4 %	Bridge Reinforcement	5	40%	1.8	4	1.8	4	1.8	2	0.9	2	0.9
						Access Agreements	7.5	60%	2.6	4	2.6	4	2.6	2	1.3	2	1.3
						Sub-total	**12.5**	**100%**	**4.4**		**4.4**		**4.4**		**2.2**		**2.2**
			Impact to Existing Facilities	5	15.4 %	Negative effect on existing infrastructure during construction	2.5	100%	4.4	4	4.4	4	4.4	1	1.1	2	2.2
						Sub-total	**2.5**	**100%**	**4.4**		**4.4**		**4.4**		**1.1**		**2.2**
			Compliance with Drinking Water Regulations	2.5	7.7 %	Compliance with California State Waterworks Standards	2.5	100%	2.2	4	2.2	4	2.2	1	0.5	2	1.1
						Sub-total	**2.5**	**100%**	**2.2**		**2.2**		**2.2**		**0.5**		**1.1**
			Flood Plain	2.5	7.7 %	Location with respect to FEMA defined floodplain	5	100%	2.2	4	2.2	3	1.6	1	0.5	2	1.1
						Sub-total	**5**	**100%**	**2.2**		**2.2**		**1.6**		**0.5**		**1.1**
			Sub-total	**32.5**	**100.0 %**				**28.6**		**26.9**		**27.0**		**14.7**		**16.1**
Public/Regional Impacts	5	14.3%	**Potential for Opposition**	10	33.3 %	Consideration to traffic, noise, air quality impacts	10	25%	1.2	2	0.6	2	0.6	4	1.2	4	1.2
						Proximity to residences	10	25%	1.2	4	1.2	4	1.2	1	0.3	2	0.6
						Potential impacts to private property	10	25%	1.2	4	1.2	4	1.2	4	1.2	4	1.2
						Potential Impacts to commercial interests	10	25%	1.2	4	1.2	4	1.2	4	1.2	4	1.2
						Sub-total	**40**	**100%**	**4.8**		**4.2**		**4.2**		**3.9**		**4.2**
			Aesthetic Impacts	7.5	25.0 %	Short term construction impacts (grading, staging areas)	10	50%	1.8	4	1.8	4	1.8	2	0.9	2	0.9
						Long term impacts (change in topography, removal of vegetation, visibility of appurtenances)	10	50%	1.8	4	1.8	4	1.8	2	0.9	2	0.9
						Sub-total	**20**	**100%**	**3.6**		**3.6**		**3.6**		**1.8**		**1.8**
			Potential Regional Benefits	5	16.7 %	Fire Protection	10	57%	1.4	3	1.0	3	1.0	4	1.4	1	0.3
						Potable Drinking Water Source for Others	5	29%	0.7	3	0.5	3	0.5	4	0.7	1	0.2
						Utility corridor (fiber, cable, phone, etc.)	2.5	14%	0.3	4	0.3	4	0.3	4	0.3	4	0.3
						Sub-total	**17.5**	**100%**	**2.4**		**1.9**		**1.9**		**2.4**		**0.9**
			Agency Cooperation/Dependence	7.5	25.0 %	Reliance on neighboring agencies for water supply and use of existing infrastructure	7.5	43%	1.5	4	1.5	4	1.5	4	1.5	4	1.5
						Construction within or near existing utility corridors	5	29%	1.0	4	1.0	4	1.0	2	0.5	1	0.3
						Reliance on other public projects (Placer County Bike Path)	5	29%	1.0	4	1.0	4	1.0	4	1.0	1	0.3
						Sub-total	**17.5**	**100%**	**3.6**		**3.6**		**3.6**		**3.1**		**2.0**
			Sub-total	**30**	**100.0 %**				**14.3**		**13.2**		**13.2**		**11.1**		**8.8**
Environmental	7.5	21.4%	**Waters**	10	33.3 %	Waters of US	10	44%	3.2	4	3.2	3	2.4	1	0.8	2	1.6
						Waters of State	10	44%	3.2	4	3.2	3	2.4	1	0.8	2	1.6
						Stream Crossings	2.5	11%	0.8	2	0.4	2	0.4	4	0.8	3	0.6
						Sub-total	**22.5**	**100%**	**7.1**		**6.7**		**5.2**		**2.4**		**3.8**
			Biological Resources	10	33.3 %	Listed Species	10	40%	2.9	4	2.9	4	2.9	4	2.9	4	2.9
						Critical Habitat	10	40%	2.9	4	2.9	4	2.9	4	2.9	4	2.9
						Species of Concern	2.5	10%	0.7	4	0.7	4	0.7	2	0.4	2	0.4
						Woodlands	2.5	10%	0.7	4	0.7	4	0.7	1	0.2	2	0.4
						Sub-total	**25**	**100%**	**7.1**		**7.1**		**7.1**		**6.3**		**6.4**
			Cultural Resources	5	16.7 %	Proximity to Water	10	33%	1.2	4	1.2	4	1.2	4	1.2	4	1.2
						Slopes	10	33%	1.2	4	1.2	4	1.2	4	1.2	4	1.2
						Known Resources	10	33%	1.2	4	1.2	4	1.2	4	1.2	4	1.2
						Sub-total	**30**	**100%**	**3.6**		**3.6**		**3.6**		**3.6**		**3.6**
			Land Use	5	16.7 %	USFS Lands	10	29%	1.0	4	1.0	4	1.0	1	0.3	2	0.5
						Private Property	7.5	21%	0.8	3	0.6	2	0.4	4	0.8	1	0.2
						Caltrans ROW	2.5	7%	0.3	1	0.1	2	0.1	3	0.2	4	0.3
						Sensitive Receptors	7.5	21%	0.8	4	0.8	2	0.4	3	0.6	1	0.2
						Traffic	2.5	7%	0.3	2	0.1	2	0.1	4	0.3	3	0.2
						Air Quality/Green House Gases	5	14%	0.5	4	0.5	4	0.5	4	0.5	4	0.5
						Sub-total	**35**	**100%**	**3.6**		**3.1**		**2.6**		**2.6**		**1.8**
			Sub-total	**30**	**100.0 %**				**21.4**		**20.5**		**18.4**		**14.8**		**15.6**
ROW Requirements	5	14.3%	**Permanent Easements**	10	80.0 %	Probability of Obtaining an Easement	10	33%	3.8	4	3.8	4	3.8	1	1.0	4	3.8
						Cost of Obtaining an Easement	10	33%	3.8	4	3.8	4	3.8	1	1.0	4	3.8
						% within Existing ROW/PUE Easement	5	17%	1.9	4	1.9	4	1.9	2	1.0	1	0.5
						Public or Private easement	5	17%	1.9	4	1.9	4	1.9	1	0.5	2	1.0
						Sub-total	**30**	**100%**	**11.4**		**11.4**		**11.4**		**3.3**		**9.0**
			Temporary Construction Easements	2.5	20.0 %	Ability to secure temporary construction easements	2.5	100%	2.9	4	2.9	4	2.9	1	0.7	2	1.4
						Sub-total	**2.5**	**100%**	**2.9**		**2.9**		**2.9**		**0.7**		**1.4**
			Sub-total	**12.5**	**100.0 %**				**14.3**		**14.3**		**14.3**		**4.0**		**10.5**
Total	**35**	**100%**							**Total**		**92.1**		**89.9**		**57.8**		**63.2**

Weight = value assigned to given criterion (or subcriterion) with respect to other criteria (or subcriteria).

Priority = the value of weights after normalization.

Matrix Weight = the metric priority multiplied by the criterion priority.

APPENDIX A - TRANSMISSION MAIN RATIONALE

Operations & Maintenance Subcriteria - Level of Operator Attention and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Number of Appurtenances (MW = 1.9)			
Hwy 89 West Shoulder	No river crossings Extremely steady grade with minimal changes 64 culvert crossings	2	1.0
Hwy 89 East Shoulder	No river crossings Extremely steady grade with minimal changes 64 culvert crossings	2	1.0
TTSA TRI	Small number of vertical changes 4 river crossings 15 culvert crossings	4	1.9
Placer County Bike Path	High number of vertical changes 8 bridge crossings 20 culvert crossings	3	1.5
Pipeline Length (MW = 1.9)			
Hwy 89 West Shoulder	Length = 42,279'	4	1.9
Hwy 89 East Shoulder	Length = 42,279'	4	1.9
TTSA TRI	Length = 43,938'	2	1.0
Placer County Bike Path	Length = 47,101'	1	0.5

Operations & Maintenance Subcriteria - Accessibility and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Remote Locations (MW = 2.6)			
Hwy 89 West Shoulder	Easily accessed by state highway	4	2.6
Hwy 89 East Shoulder	Easily accessed by state highway	4	2.6
TTSA TRI	Majority of the alignment is on the east side of the Truckee River Accessible from multiple private driveways/access	2	1.3
Placer County Bike Path	Path ascends and descends wooded hillside and crosses the Truckee River multiple times Accessible from limited locations	1	0.6
Paved Road vs. Dirt Road (MW = 1.9)			
Hwy 89 West Shoulder	Paved access	4	1.9
Hwy 89 East Shoulder	Paved access	4	1.9
TTSA TRI	Previously disturbed corridor Limited paving or surface improvement	1	0.5
Placer County Bike Path	Bike path will have a paved surface for the entire	2	1.0

Type of Vehicle Access (MW = 1.3)			
Hwy 89 West Shoulder	Alignment accessible by all vehicle types	4	1.3
Hwy 89 East Shoulder	Alignment accessible by all vehicle types	4	1.3
TTSA TRI	Alignment accessible by light truck and/or light backhoe Access further limited in winter months	2	0.6
Placer County Bike Path	Alignment accessible by light truck and/or light backhoe Access further limited in winter months	2	0.6

Operations & Maintenance Subcriteria - Impacts from Repair and Maintenance and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Traffic Control (MW = 2.3)			
Hwy 89 West Shoulder	Repair and maintenance activities will require significant traffic control measures	2	1.2
Hwy 89 East Shoulder	Repair and maintenance activities will require significant traffic control measures	2	1.2
TTSA TRI	Minimal traffic control required for repair and maintenance activities	4	2.3
Placer County Bike Path	Moderate traffic control measures will be required for pedestrians and bike traffic	3	1.8
Pedestrian/Public Impacts (MW = 1.2)			
Hwy 89 West Shoulder	Repair and maintenance activities may require bicycle traffic to be re-routed Vehicle traffic shall be impacted but not closed or re-routed	2	0.6
Hwy 89 East Shoulder	Repair and maintenance activities may require bicycle traffic to be re-routed Vehicle traffic shall be impacted but not closed or re-routed	2	0.6
TTSA TRI	Repair and maintenance activities will have a minimal impact to public access and activities Only impact public in areas where the alignment parallels the bike path or highway 89	4	1.2
Placer County Bike Path	Since the use of the corridor is for public recreation, repair and maintenance activities have the potential to impact public access and use Vehicle traffic will not be impacted	3	0.9

AC Repair (MW = 1.8)			
Hwy 89 West Shoulder	Pipeline repairs have the potential to require significant asphalt replacement requirements Asphalt section is 12-inches on 24-inches of base AC grind and overlay to the nearest left hand joint will be required	2	0.9
Hwy 89 East Shoulder	Pipeline repairs have the potential to require significant asphalt replacement requirements Asphalt section is 12-inches on 24-inches of base AC grind and overlay to the nearest left hand joint will be required	2	0.9
TTSA TRI	Since the alignment has minimal existing asphalt pavement, future maintenance activities should not require AC repair	4	1.8
Placer County Bike Path	The entire alignment will be adjacent to or paved with asphalt Repair and maintenance activities will require asphalt replacement Asphalt section is 4-inches on 8-inches of base AC grind and overlay will not be required	3	1.3
Revegetation/BMPs (MW = 0.6)			
Hwy 89 West Shoulder	The existing corridor is paved and protected with existing drainage structures Temporary BMP's will be required during repairs, however significant measures should not be needed	4	0.6
Hwy 89 East Shoulder	The existing corridor is paved and protected with existing drainage structures Temporary BMP's will be required during repairs, however significant measures should not be needed	4	0.6
TTSA TRI	Most significant revegetation and BMP's required to match existing native landscape The alignment also parallels the Truckee River which will require drainage conveyance measures and protection from flooding	1	0.1
Placer County Bike Path	Some significant revegetation and BMP's required Alignment is not as significant of a drainage corridor as that of the Highway 89 or the Truckee River	2	0.3

Operations & Maintenance Subcriteria - Agency Coordination/Permitting and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Stream Crossings (MW = 1.7)			
Hwy 89 West Shoulder	7 creeks will be crossed Zero Truckee River crossings	3	1.3
Hwy 89 East Shoulder	7 creeks will be crossed Zero Truckee River crossings	3	1.3
TTSA TRI	3 creeks will be crossed 4 Truckee River crossings	1	0.4
Placer County Bike Path	5 creeks will need to be crossed Zero underground Truckee River crossings	4	1.7
Bridge Crossings (MW = 1.1)			
Hwy 89 West Shoulder	No bridge crossings required	4	1.1
Hwy 89 East Shoulder	No bridge crossings required	4	1.1
TTSA TRI	No bridge crossings required	4	1.1
Placer County Bike Path	8 bridge crossings required	1	0.3
Impacts to Existing Infrastructure (MW = 0.6)			
Hwy 89 West Shoulder	O&M activates should have minimal impact to existing infrastructure: roads, culverts	4	0.4
Hwy 89 East Shoulder	O&M activates should have minimal impact to existing infrastructure: roads, culverts	4	0.4
TTSA TRI	O&M activates may impact existing infrastructure: sewer interceptor, data/cable, powerlines	1	0.1
Placer County Bike Path	O&M activates should have minimal impact to existing infrastructure: bike path, powerlines	2	0.6
Interference with Other Utilities (MW = 0.6)			
Hwy 89 West Shoulder	Caltrans shall be the only utility/agency the District would need to contact regarding repairs and maintenance activities Caltrans maintenance agreement will be in place	4	0.6
Hwy 89 East Shoulder	Caltrans shall be the only utility/agency the District would need to contact regarding repairs and maintenance activities Caltrans maintenance agreement will be in place	4	0.6
TTSA TRI	District will need to coordinate all repairs and maintenance activities with TTSA Liberty Energy, AT&T and/or Suddenlink Communications may need to be contacted prior to making repairs to the pipeline Since the entire length of the pipeline will be adjacent to the TRI interceptor, all repairs and maintenance activities have the potential to impact TTSA's assets	1	0.1
Placer County Bike Path	District will need to coordinate all repairs and maintenance activities with Placer Co. TTSA, Liberty Energy, AT&T and/or Suddenlink Communications may need to be contacted prior to making repairs to the pipeline	2	0.3

Operations & Maintenance Subcriteria - Impacts from Natural Disaster and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Flooding (MW = 0.6)			
Hwy 89 West Shoulder	Approximately 1,500 lf of highway lies within Zone X, A or AE It is presumed that the greater the length of the pipeline which lies within the 100-year flood zone, the greater the probability for flood events to cause repair and maintenance issues	4	0.6
Hwy 89 East Shoulder	Approximately 3,000 lf of highway lies within Zone X, A or AE It is presumed that the greater the length of the pipeline which lies within the 100-year flood zone, the greater the probability for flood events to cause repair and maintenance issues	3	0.4
TTSA TRI	The majority of the alignment is within the Zone X, A or AE flood determination It is presumed that the greater the length of the pipeline which lies within the 100-year flood zone, the greater the probability for flood events to cause repair and maintenance issues	1	0.1
Placer County Bike Path	A large part of the alignment is within the Zone X, A or AE flood determination This alternative will climb hillsides adjacent to the Truckee River and will be outside of the 100-year flood zone for some portions It is presumed that the greater the length of the pipeline which lies within the 100-year flood zone, the greater the probability for flood events to cause repair and maintenance issues	2	0.3

Landslides (MW = 0.6)			
Hwy 89 West Shoulder	Highway 89 has been designed and constructed to limit landslide potential With the pipeline alignment falling within the highway 89 corridor it is presumed that the pipeline will be well protected from landslides	4	0.6
Hwy 89 East Shoulder	Highway 89 has been designed and constructed to limit landslide potential With the pipeline alignment falling within the highway 89 corridor it is presumed that the pipeline will be well protected from landslides	4	0.6
TTSA TRI	There are portions of the TRI alignment which have already experienced landslides, therefore the potential for damage as a result of landslides is greatest for this alternative	1	0.1
Placer County Bike Path	Much of this alignment will be constructed along the eastern slope of the Truckee River corridor which has a history of landslides Retaining walls will be constructed with the pipeline and should reduce the landslide potential in this area	2	0.3
Stream Bank Erosion (MW = 0.6)			
Hwy 89 West Shoulder	Alignment is furthest from the Truckee River Alternatives with a close proximity to the Truckee River are subject to damage from stream bank erosion	4	0.6
Hwy 89 East Shoulder	Alignment is slightly closer to the Truckee River than the west shoulder of highway 89 Alternatives with a close proximity to the Truckee River are subject to damage from stream bank erosion	3	0.4
TTSA TRI	Alignment is directly adjacent to the Truckee River and has experienced erosion damage in past storm	1	0.1
Placer County Bike Path	This alignment parallels the Truckee River and ascends and descends the hillsides to the east of the river The construction of new retaining walls should reduce	2	0.3

Fire (MW = 0.3)			
Hwy 89 West Shoulder	The highway 89 corridor is easily accessed by emergency vehicles Highway 89 provides a wide swath of defensible space which provides little potential for wildfire	4	0.3
Hwy 89 East Shoulder	The highway 89 corridor is easily accessed by emergency vehicles Highway 89 provides a wide swath of defensible space which provides little potential for wildfire	4	0.3
TTSA TRI	The Truckee River corridor is not easily accessed by emergency vehicles The pipeline alignment is heavily vegetated and is prone to wildfire	2	0.1
Placer County Bike Path	The Truckee River corridor is not easily accessed by emergency vehicles The pipeline alignment is heavily vegetated and is prone to wildfire	2	0.1

Engineering Subcriteria - Constructability and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Standard vs. Non-Standard Methods (MW = 2.1)			
Hwy 89 West Shoulder	This alignment is highly conducive to standard open trench pipeline construction	4	2.1
Hwy 89 East Shoulder	This alignment is highly conducive to standard open trench pipeline construction	4	2.1
TTSA TRI	This alignment is highly conducive to standard open trench pipeline construction	4	2.1
Placer County Bike Path	This alignment is highly conducive to standard open trench pipeline construction	4	2.1
Material Staging (MW = 2.1)			
Hwy 89 West Shoulder	This alignment is highly conducive to efficient material staging in the shoulder of highway 89	4	2.1
Hwy 89 East Shoulder	This alignment is highly conducive to efficient material staging in the shoulder of highway 89	4	2.1
TTSA TRI	Materials staging over the entire length of the alignment will not be possible	2	1.0
Placer County Bike Path	Materials staging over the entire length of the alignment will not be possible	2	1.0
Construction Vehicle Access (MW = 1.6)			
Hwy 89 West Shoulder	This alternative provides adequate access for all types of construction equipment	4	1.6
Hwy 89 East Shoulder	This alternative provides adequate access for all types of construction equipment	4	1.6
TTSA TRI	This alternative has narrow reaches and access points (i.e. bridges) which can not accommodate large and/or heavy construction	2	0.8
Placer County Bike Path	This alternative has narrow reaches and access points (i.e. bridges) which can not accommodate large and/or heavy construction	2	0.8
Jack and Bore (MW = 1.0)			
Hwy 89 West Shoulder	This alternative has 64 culvert crossings which will require jack and bore construction Total length of jack and bore = 3,400 lf	2	0.5
Hwy 89 East Shoulder	This alternative has 64 culvert crossings and 1 highway 89 crossing which will require jack and bore construction Total length of jack and bore = 3,600 lf	2	0.5
TTSA TRI	This alternative has 4 river crossings, 15 culvert crossings and 1 highway 89 crossing which will require jack and bore construction Total length of jack and bore = 1,750 lf	3	0.8
Placer County Bike Path	This alternative utilizes bridges to cross the Truckee River and will only require jack and bore construction for 20 culvert crossings and 1 highway 89 crossing Total length of jack and bore = 1,200 lf	4	1.0

Bridge Crossings (MW = 1.0)			
Hwy 89 West Shoulder	Zero bridge crossings	4	1.0
Hwy 89 East Shoulder	Zero bridge crossings	4	1.0
TTSA TRI	Zero bridge crossings	4	1.0
Placer County Bike Path	This alternative utilizes bridges to cross the Truckee River Total number of bridges = 8	1	0.3
Traffic Control (MW = 1.0)			
Hwy 89 West Shoulder	Significant traffic control (i.e. night work, K-rail, Caltrans inspector, etc.) will be required	2	0.5
Hwy 89 East Shoulder	Significant traffic control (i.e. night work, K-rail, Caltrans inspector, etc.) will be required	2	0.5
TTSA TRI	Traffic control will only be needed at access points and along lengths of the alignment which parallels highway 89	4	1.0
Placer County Bike Path	Traffic control will only be needed at access points and along lengths of the alignment which parallels highway 90	4	1.0

Engineering Subcriteria - Geotechnical Constraints and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
# of Retaining Walls (MW = 2.6)			
Hwy 89 West Shoulder	No retaining walls required	4	2.6
Hwy 89 East Shoulder	No retaining walls required	4	2.6
TTSA TRI	Low number of retaining walls required	2	1.3
Placer County Bike Path	High number of retaining walls required	1	0.7
Trench Integrity (MW = 1.3)			
Hwy 89 West Shoulder	Most of the alignment is along previously disturbed soils with a minimal amount of cobbles or sands visible	4	1.3
Hwy 89 East Shoulder	Most of the alignment is along previously disturbed soils with a minimal amount of cobbles or sands visible	4	1.3
TTSA TRI	The majority of the length of the TTSA TRI alignment is directly adjacent to the Truckee River It is presumed that the Truckee River bed includes a high volume of cobbles and/or sands	1	0.3
Placer County Bike Path	Since the bike path alignment strays from the TTSA TRI alignment, it is presumed that the soils in these reaches are superior to the river bed material of the TRI alignment	2	0.7

Reuse of Spoils for Backfill (MW = 1.3)			
Hwy 89 West Shoulder	The west shoulder of highway 89 is built into a cut slope which means that trench excavation will be made into native soils which may contain unsuitable material	3	1.0
Hwy 89 East Shoulder	The east shoulder of highway 89 is built up on a fill slope which is constructed from engineered fill which contains suitable material for backfill applications	4	1.3
TTSA TRI	Mix of native soils and engineered fill with a similar potential for unsuitable material as the highway 89 west shoulder and the TTSA TRI alignment	3	1.0
Placer County Bike Path	Similar characteristics to the TTSA TRI	3	1.0
Rock Excavation (MW = 1.3)			
Hwy 89 West Shoulder	Visual inspection has not yielded a significant quantity of rock	3	1.0
Hwy 89 East Shoulder	Visual inspection has not yielded a significant quantity of rock Alternative is assumed to have less rock due to its make-up of engineered fill material	4	1.3
TTSA TRI	Visual inspection has not yielded a significant quantity of rock	3	1.0
Placer County Bike Path	Visual inspection has not yielded a significant quantity of rock	3	1.0

Engineering Subcriteria - Accessibility and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Bridge Reinforcement (MW = 1.8)			
Hwy 89 West Shoulder	Bridge reinforcement not required	4	1.8
Hwy 89 East Shoulder	Bridge reinforcement not required	4	1.8
TTSA TRI	Bridge reinforcement may be required	2	0.9
Placer County Bike Path	Bridge reinforcement may be required	2	0.9
Access Agreements (MW = 2.6)			
Hwy 89 West Shoulder	Access agreements with private parties for construction activities are not required	4	2.6
Hwy 89 East Shoulder	Access agreements with private parties for construction activities are not required	4	2.6
TTSA TRI	Access agreements with private parties for construction activities are required	2	1.3
Placer County Bike Path	Access agreements with private parties for construction activities are required	2	1.3

Engineering Subcriteria - Impacts to Existing Facilities and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Negative Effect on Existing Infrastructure During Construction (MW = 4.4)			
Hwy 89 West Shoulder	Least potential for negative impact to existing facilities (i.e. data/cable, OH electrical lines)	4	4.4
Hwy 89 East Shoulder	Least potential for negative impact to existing facilities (i.e. data/cable, OH electrical lines)	4	4.4
TTSA TRI	Greatest potential for negative impact to existing facilities (i.e. TRI interceptor, data/cable, OH electrical lines)	1	1.1
Placer County Bike Path	Minimal potential for negative impact to existing facilities (i.e. TRI interceptor, data/cable, OH electrical lines)	2	2.2

Engineering Subcriteria - Compliance with Drinking Water Regulations and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Compliance with California State Waterworks Standards (MW = 2.2)			
Hwy 89 West Shoulder	No known compliance issues	4	2.2
Hwy 89 East Shoulder	No known compliance issues	4	2.2
TTSA TRI	Waiver needed to construct the water main within 10-foot envelope of active sewer main	1	0.5
Placer County Bike Path	Small portion of alignment parallels the TTSA TRI alignment These areas present an opportunity for non-compliance with current DWR standards	2	1.1

Engineering Subcriteria - Flood Plain and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Location FEMA Defined Floodplain (MW = 2.2)			
Hwy 89 West Shoulder	Approximately 1,500 lf of highway lies within Zone X, A or AE It is presumed that the greater the length of the pipeline which lies within the 100-year flood zone, the greater the need for design and construction of flood related considerations.	4	2.2
Hwy 89 East Shoulder	Approximately 3,000 lf of highway lies within Zone X, A or AE	3	1.6
TTSA TRI	The majority of the alignment is within the Zone X, A or AE flood determination	1	0.5
Placer County Bike Path	A large part of the alignment is within the Zone X, A or AE flood determination	2	1.1

Public & Regional Impacts Subcriteria - Potential for Opposition and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Consideration to traffic, noise, air quality impacts (MW = 1.2)			
Hwy 89 West Shoulder	Highway 89 corridor is already noisy High potential for traffic impacts Construction activities will have similar impacts for all alternatives	2	0.6
Hwy 89 East Shoulder	Highway 89 corridor is already noisy High potential for traffic impacts Construction activities will have similar impacts for all alternatives	2	0.6
TTSA TRI	TRI corridor has minimal existing air quality or noise issues Low potential for traffic impacts Construction activities will have similar impacts for all alternatives	4	1.2
Placer County Bike Path	Bike path corridor has minimal existing air quality or noise issues Low potential for traffic impacts Assumes bike path is not built and in use Construction activities will have similar impacts for all alternatives	4	1.2
Proximity to residences (MW = 1.2)			
Hwy 89 West Shoulder	Greatest distance to residences and/or commercial properties	4	1.2
Hwy 89 East Shoulder	Greatest distance to residences and/or commercial properties	4	1.2
TTSA TRI	Alignment is adjacent to the highest number of existing residences	1	0.3
Placer County Bike Path	Alignment will traverse publically owned property only There are not currently any residential or commercial uses on publically owned	2	0.6
Potential impacts to private property(MW = 1.2)			
Hwy 89 West Shoulder	Minimal opportunity for alignment to impact private property No negative impact to private property	4	1.2
Hwy 89 East Shoulder	Minimal opportunity for alignment to impact private property No negative impact to private property	4	1.2
TTSA TRI	No negative impact to private property	4	1.2
Placer County Bike Path	No opportunity for alignment to impact private property No negative impact to private property	4	1.2

Potential impacts to commercial interests (MW = 1.2)			
Hwy 89 West Shoulder	Minimal opportunity for alignment to impact commercial land uses No negative impact to commercial properties	4	1.2
Hwy 89 East Shoulder	Minimal opportunity for alignment to impact commercial land uses No negative impact to commercial properties	4	1.2
TTSA TRI	No negative impact to commercial land uses	4	1.2
Placer County Bike Path	No opportunity for alignment to impact commercial land uses No negative impact to commercial properties	4	1.2

Public & Regional Impacts Subcriteria - Aesthetic Impacts and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Short Term construction impacts (grading, staging areas) (MW = 1.8)			
Hwy 89 West Shoulder	Minimal short term impacts to how the highway 89 corridor is seen and experienced by the public	4	1.8
Hwy 89 East Shoulder	Minimal short term impacts to how the highway 89 corridor is seen and experienced by the public	4	1.8
TTSA TRI	During construction this alternative will moderately alter the landscape, topography and environment in which the pipeline will be installed	2	0.9
Placer County Bike Path	During construction this alternative will moderately alter the landscape, topography and environment in which the pipeline will be installed	2	0.9
Long Tern impacts (change in topography, removal of vegetation, visibility of appurtenances) (MW = 1.8)			
Hwy 89 West Shoulder	Minimal long term impact to the highway 89 corridor	4	1.8
Hwy 89 East Shoulder	Minimal long term impact to the highway 89 corridor	4	1.8
TTSA TRI	Moderate long term impact to the highway 89 corridor	2	0.9
Placer County Bike Path	Moderate long term impact to the highway 89 corridor	2	0.9

Public & Regional Impacts Subcriteria - Potential Regional Benefits and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Fire Protection (MW = 1.4)			
Hwy 89 West Shoulder	Limited proximity to existing residences Potential for private residences to be	3	1.0
Hwy 89 East Shoulder	Limited proximity to existing residences Potential for private residences to be	3	1.0
TTSA TRI	Closest proximity to existing residences Potential for the greatest number of private residences to be impacted	4	1.4
Placer County Bike Path	Minimal proximity to existing residences Potential for private residences to be	1	0.3
Potable Drinking Water Source for Others (MW = 0.7)			
Hwy 89 West Shoulder	Limited proximity to existing residences Moderate potential for potable drinking water source	3	0.5
Hwy 89 East Shoulder	Limited proximity to existing residences Moderate potential for potable drinking water source	3	0.5
TTSA TRI	Closest proximity to existing residences High potential for potable drinking water	4	0.7
Placer County Bike Path	Minimal proximity to existing residences Least potential for potable drinking water source	1	0.2
Utility corridor (fiber, cable, phone, etc.) (MW = 0.3)			
Hwy 89 West Shoulder	Similar potential for joint utility corridor for all alternatives	4	0.3
Hwy 89 East Shoulder	Similar potential for joint utility corridor for all alternatives	4	0.3
TTSA TRI	Similar potential for joint utility corridor for all alternatives	4	0.3
Placer County Bike Path	Similar potential for joint utility corridor for all alternatives	4	0.3

Public & Regional Impacts Subcriteria - Agency Cooperation/Dependence and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Reliance on neighboring agencies for water supply and use of existing infrastructure (MW = 1.5)			
Hwy 89 West Shoulder	All alternative's require agency cooperation and use of existing infrastructure from NCSD and/or TDPUD to transmit water from source to the District	4	1.5
Hwy 89 East Shoulder	All alternative's require agency cooperation and use of existing infrastructure from NCSD and/or TDPUD to transmit water from source to the District	4	1.5
TTSA TRI	All alternative's require agency cooperation and use of existing infrastructure from NCSD and/or TDPUD to transmit water from source to the District	4	1.5
Placer County Bike Path	All alternative's require agency cooperation and use of existing infrastructure from NCSD and/or TDPUD to transmit water from source to the District	4	1.5
Construction within or near existing utility corridors (MW = 1.0)			
Hwy 89 West Shoulder	Not an existing utility corridor Existing highway is highly conducive to a water main pipeline	4	1.0
Hwy 89 East Shoulder	Not an existing utility corridor Existing highway is highly conducive to a water main pipeline	4	1.0
TTSA TRI	Existing utility corridor Sewer interceptor and potable water main require regulatory measures to provide safety	2	0.5
Placer County Bike Path	No existing utility corridor Public is in favor of the construction of the bike path	1	0.3
Reliance on other public projects (Placer County Bike Path) (MW = 1.0)			
Hwy 89 West Shoulder	No influence or reliance on other projects	4	1.0
Hwy 89 East Shoulder	No influence or reliance on other projects	4	1.0
TTSA TRI	No influence or reliance on other projects	4	1.0
Placer County Bike Path	Not feasible if the Placer Co bike path is not constructed Pipeline must be built prior to the bike path	1	0.3

Enviromental Subcriteria - Waters and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Water of US (MW = 3.2)			
Highway 89 West Shoulder	6.37 acres of waters within 100ft impact	4	3.2
Highway 89 East Shoulder	16.49 acres of waters within 100ft impact buffer	3	2.4
Placer County Bike Path	37.95 acres of waters within 100ft impact buffer	1	0.8
TTSA TRI Sewer Interceptor	21.39 acres of waters within 100ft impact buffer	2	1.6
Waters of State (MW = 3.2)			
Highway 89 West Shoulder	6.24 acres of waters within 100ft impact	4	3.2
Highway 89 East Shoulder	13.72 acres of waters within 100ft impact buffer	3	2.4
Placer County Bike Path	25.29 acres of waters within 100ft impact buffer	1	0.8
TTSA TRI Sewer Interceptor	20.65 acres of waters within 100ft impact buffer	2	1.6
Stream Crossings (MW = 0.8)			
Highway 89 West Shoulder	7 usgs stream crossings	2	0.4
Highway 89 East Shoulder	7 usgs stream crossings	2	0.4
Placer County Bike Path	3 usgs stream crossings	4	0.8
TTSA TRI Sewer Interceptor	5 usgs stream crossings	3	0.6

Enviromental Subcriteria - Biological Resources and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Listed Species (MW = 2.9)			
Highway 89 West Shoulder	1 state threatened (California wolverine) within 100 ft impact buffer	4	2.9
Highway 89 East Shoulder	1 state threatened (California wolverine) within 100 ft impact buffer	4	2.9
Placer County Bike Path	1 state threatened (California wolverine) within 100 ft impact buffer	4	2.9
TTSA TRI Sewer Interceptor	1 state threatened (California wolverine) within 100 ft impact buffer	4	2.9
Critical Habitat (MW = 2.9)			
Highway 89 West Shoulder	No critical habitat within 100 ft impact buffer	4	2.9
Highway 89 East Shoulder	No critical habitat within 100 ft impact buffer	4	2.9
Placer County Bike Path	No critical habitat within 100 ft impact buffer	4	2.9
TTSA TRI Sewer Interceptor	No critical habitat within 100 ft impact buffer	4	2.9

Species of Concern (MW = 0.7)			
Highway 89 West Shoulder	7 occurences of 4 species within 100 ft impact buffer	4	0.7
Highway 89 East Shoulder	7 occurences of 4 species within 100 ft impact	4	0.7
Placer County Bike Path	8 occurences of 5 species within 100 ft impact buffer	2	0.4
TTSA TRI Sewer Interceptor	8 occurences of 5 species within 100 ft impact	2	0.4
Woodlands (MW = 0.7)			
Highway 89 West Shoulder	0.30 acres of Forest within 100ft impact	4	0.7
Highway 89 East Shoulder	18.91 acres of Forest within 100ft impact buffer but all in disturbed shoulder	4	0.7
Placer County Bike Path	134.75 acres of Forest within 100ft impact buffer but score considered for after bike path	1	0.2
TTSA TRI Sewer Interceptor	78.97 acres of Forest within 100ft impact buffer but in previously disturbed corridor	2	0.4

Enviromental Subcriteria - Cultural Resources and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Proximity to Water (MW = 1.2)			
Highway 89 West Shoulder	within 300 feet of water	4	1.2
Highway 89 East Shoulder	within 300 feet of water	4	1.2
Placer County Bike Path	within 300 feet of water	4	1.2
TTSA TRI Sewer Interceptor	within 300 feet of water	4	1.2
Slopes (MW = 1.2)			
Highway 89 West Shoulder	minimal slopes in river valley	4	1.2
Highway 89 East Shoulder	minimal slopes in river valley	4	1.2
Placer County Bike Path	minimal slopes in river valley	4	1.2
TTSA TRI Sewer Interceptor	minimal slopes in river valley	4	1.2
Known Resources (MW = 1.2)			
Highway 89 West Shoulder	record searches and surveys done - multiple known resources	4	1.2
Highway 89 East Shoulder	record searches and surveys done - multiple known resources	4	1.2
Placer County Bike Path	record searches and surveys done - multiple known resources	4	1.2
TTSA TRI Sewer Interceptor	record searches and surveys done - multiple known resources	4	1.2

Enviromental Subcriteria - Land Use and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
USFS Lands (MW = 1.0)			
Highway 89 West Shoulder	USFS lands avoidable - 62 parcels 0.30 acres and 14 parcels owned by the USA within 100ft impact buffer	4	1.0
Highway 89 East Shoulder	USFS lands avoidable - 58 parcels 18.91 acres and 24 parcels owned by the USA within 100ft impact buffer	4	1.0
Placer County Bike Path	65 parcels 134.75 acres and 27 parcels owned by the USA within 100ft impact buffer	1	0.3
TTSA TRI Sewer Interceptor	57 parcels 78.97 acres and 28 parcels owned by the USA within 100ft impact buffer	2	0.5
Private Property (MW = 0.8)			
Highway 89 West Shoulder	22 private property owners within 100ft impact buffer	3	0.6
Highway 89 East Shoulder	24 private property owners within 100ft impact buffer	2	0.4
Placer County Bike Path	12 private property owners within 100ft	4	0.8
TTSA TRI Sewer Interceptor	56 private property owners 27 additonal private property parcels with road easement within 100ft buffer	1	0.2
Caltrans ROW (MW = 0.3)			
Highway 89 West Shoulder	157.12 acres of ROW within 100ft buffer	2	0.1
Highway 89 East Shoulder	148.33 acres of ROW within 100ft buffer	2	0.1
Placer County Bike Path	67.07 acres of ROW within 100ft buffer	3	0.2
TTSA TRI Sewer Interceptor	62.06 acres of ROW within 100ft buffer	4	0.3
Sensitive Receptors (MW = 0.8)			
Highway 89 West Shoulder	34 receptors within 100ft impact corridor	4	0.8
Highway 89 East Shoulder	42 receptors within 100ft impact corridor	2	0.4
Placer County Bike Path	38 receptors within 100ft impact corridor	3	0.6
TTSA TRI Sewer Interceptor	67 receptors within 100ft impact corridor	1	0.2

Traffic (MW = 0.3)			
Highway 89 West Shoulder	Construction within the Caltrans ROW would pose the greatest short term traffic impacts There are a number of private parcel driveways that would have a short term	2	0.1
Highway 89 East Shoulder	Construction within the Caltrans ROW would pose the greatest short term traffic impacts There are a number of private parcel driveways that would have a short term	2	0.1
Placer County Bike Path	Would require the least amount of traffic control measures	4	0.3
TTSA TRI Sewer Interceptor	Would require the least amount of traffic control measures Some traffic control required where constructed adjacent to or within the Caltrans	3	0.2
Air Quality/Greenhouse Gases (MW = 0.5)			
Highway 89 West Shoulder	Construction time would likely span 2-3 seasons for all alternatives	4	0.5
Highway 89 East Shoulder	Construction time would likely span 2-3 seasons for all alternatives	4	0.5
Placer County Bike Path	Construction time would likely span 2-3 seasons for all alternatives	4	0.5
TTSA TRI Sewer Interceptor	Construction time would likely span 2-3 seasons for all alternatives	4	0.5

ROW Requirements Subcriteria - Permanent Easements and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Probability of Obtaining an Easement (MW = 3.8)			
Hwy 89 West Shoulder	Very probable	4	3.8
Hwy 89 East Shoulder	Very probable	4	3.8
TTSA TRI	Least probable	1	1.0
Placer County Bike Path	Very probable	4	3.8
Cost of Obtaining an Easement (MW =3.8)			
Hwy 89 West Shoulder	Minimal cost No private owner negotiations	4	3.8
Hwy 89 East Shoulder	Minimal cost No private owner negotiations	4	3.8
TTSA TRI	Greatest cost Highest number of private owner negotiations	1	1.0
Placer County Bike Path	Minimal cost No private owner negotiations	4	3.8
% within Existing ROW/PUE Easement (MW = 1.9)			
Hwy 89 West Shoulder	Existing Caltrans ROW	4	1.9
Hwy 89 East Shoulder	Existing Caltrans ROW	4	1.9
TTSA TRI	Existing easement New easement required	2	1.0
Placer County Bike Path	No existing easement/ROW	1	0.5
Public or Private Easement (MW = 1.9)			
Hwy 89 West Shoulder	Public easement - Caltrans	4	1.9
Hwy 89 East Shoulder	Public easement - Caltrans	4	1.9
TTSA TRI	Public and private easements needed	1	0.5
Placer County Bike Path	Public easement - Caltrans and USFS	2	1.0

ROW Requirements Subcriteria - Temporary Construction Easements and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Ability to secure temporary construction easements (MW = 2.9)			
Hwy 89 West Shoulder	Favorable All easements with public entity	4	2.9
Hwy 89 East Shoulder	Favorable All easements with public entity	4	2.9
TTSA TRI	Unfavorable Easements with private owners required	1	0.7
Placer County Bike Path	Moderately favorable Easements with USFS required	2	1.4

Appendix B

Transmission Main Construction Cost Estimate

Highway 89 West Shoulder Planning Level Cost Estimate

Item No.	Description	Qty.	Unit	Unit Cost	Cost	
1.0	**Mobilization/Demobilization**					
1.1	Mobilization/Demobilization	1	L.S.	$690,101	$690,101	
2.0	**Capital Cost**					
2.1	10-inch Ductile Iron Transmission Main (HWY 89 West Shoulder)	41,662	L.F.	$175	$7,290,850	
2.2	Pavement Patch (3" AC/8" Base)	3,000	S.F.	$5.50	$16,500	
2.3	Pavement Patch (12" AC/24" Base)	130,000	S.F.	$15.00	$1,950,000	
2.4	Grind and Overlay	208,000	S.F.	$3.00	$624,000	
2.5	Jack and Bore (25' for Culvert Crossing, 75' for Highway Crossing)	875	L.F.	$500	$437,500	
2.6	Traffic Control	1	L.S.	$900,000	$900,000	
2.7	Testing and Disinfection	1	L.S.	$100,000	$100,000	
2.8	Stormwater Pollution Prevention Plan (SWPPP)	1	L.S.	$250,000	$250,000	
2.9	Revegatation/Landscape	1	L.S.	$25,000	$25,000	
2.10	Construction Access/Staging	1	L.S.	$146,000	$146,000	
2.11	Rock Excavation	2,750	C.Y.	$80	$219,975	
2.12	Fire Hydrants	42	E.A.	$6,000	$249,972	
2.13	Slurry Backfill	26,039	L.F.	$25	$650,969	
2.14	Culvert Crossing - Standard Construction	32	E.A.	$5,000	$160,000	
	Total Construction Cost of the Transmission Line					**$ 13,711,000**

Highway 89 East Shoulder Planning Level Cost Estimate

Item No.	Description	Qty.	Unit	Unit Cost	Cost	
1.0	**Mobilization/Demobilization**					
1.1	Mobilization/Demobilization	1	L.S.	$684,155	$684,155	
2.0	**Capital Cost**					
2.1	10-inch Ductile Iron Transmission Main (HWY 89 West Shoulder)	41,677	L.F.	$175	$7,293,475	
2.2	Pavement Patch (3" AC/8" Base)	8,000	S.F.	$5.50	$44,000	
2.3	Pavement Patch (12" AC/24" Base)	130,000	S.F.	$15.00	$1,950,000	
2.4	Grind and Overlay	208,000	S.F.	$3.00	$624,000	
2.5	Jack and Bore (25' for Culvert Crossing, 75' for Highway Crossing)	875	L.F.	$500	$437,500	
2.6	Traffic Control	1	L.S.	$900,000	$900,000	
2.7	Testing and Disinfection	1	L.S.	$100,000	$100,000	
2.8	Stormwater Pollution Prevention Plan (SWPPP)	1	L.S.	$250,000	$250,000	
2.9	Revegatation/Landscape	1	L.S.	$25,000	$25,000	
2.10	Construction Access/Staging	1	L.S.	$150,000	$150,000	
2.11	Rock Excavation	917	C.Y.	$80	$73,352	
2.12	Fire Hydrants	42	E.A.	$6,000	$250,062	
2.13	Slurry Backfill	26,048	L.F.	$25	$651,203	
2.14	Culvert Crossing - Standard Construction	32	E.A.	$5,000	$160,000	
	Total Construction Cost of the Transmission Line					**$ 13,593,000**

TTSA TRI Alignment Planning Level Cost Estimate

Item No.	Description	Qty.	Unit	Unit Cost	Cost	
1.0	**Mobilization/Demobilization**					
1.1	Mobilization/Demobilization	1	L.S.	$638,099	$638,099	
2.0	**Capital Cost**					
2.1	10-inch Ductile Iron Transmission Main (TTSA Alignment)	44,049	L.F.	$175	$7,708,575	
2.2	Pavement Patch (3" AC/8" Base)	11,000	S.F.	$5.50	$60,500	
2.3	Pavement Patch (12" AC/24" Base)	22,500	S.F.	$15.00	$337,500	
2.4	Grind and Overlay	36,500	S.F.	$3.00	$109,500	
2.5	Jack and Bore (25' for Culvert Crossing, 75' for Highway Crossing, 100' for River Crossing)	1,025	L.F.	$500	$512,500	
2.6	Traffic Control	1	L.S.	$319,000	$319,000	
2.7	Testing and Disinfection	1	L.S.	$100,000	$100,000	
2.8	Stormwater Pollution Prevention Plan (SWPPP)	1	L.S.	$250,000	$250,000	
2.9	Revegatation/Landscape	1	L.S.	$250,000	$250,000	
2.10	Construction Access/Staging	1	L.S.	$771,000	$771,000	
2.11	Rock Excavation	8,810	C.Y.	$80	$704,784	
2.12	Grading/Retaining Walls	1,466	L.F.	$625	$916,250	
2.13	Culvert Crossing - Standard Construction	11	E.A.	$5,000	$55,000	
2.14	Fire Hydrants	44	E.A.	$6,000	$264,294	
2.15	Slurry Backfill	4,547	L.F.	$25	$113,675	
	Total Construction Cost of the Transmission Line					**$ 13,111,000**

Placer County Bike Path Planning Level Cost Estimate

Item No.	Description	Qty.	Unit	Unit Cost	Cost	
1.0	**Mobilization/Demobilization**					
1.1	Mobilization/Demobilization	1	L.S.	$802,751	$802,751	
2.0	**Capital Cost**					
2.1	10-inch Ductile Iron Transmission Main (Placer Co Preferred Alignment)	48,000	L.F.	$175	$8,400,000	
2.2	Pavement Patch (3" AC/8" Base)	2,000	S.F.	$5.50	$11,000	
2.3	Grading/Retaining Walls	11,891	L.F.	$625	$7,431,875	
2.4	Grading/Retaining Walls (Placer Co. Cost Sharing)	5,946	L.F.	-$625	-$3,715,938	
2.5	Bridge Crossing	400	LF	$500	$200,000	
2.6	Jack and Bore (25' for Culvert Crossing, 75' for Highway Crossing)	1,000	L.F.	$500	$500,000	
2.7	Traffic Control	1	L.S.	$261,310	$261,310	
2.8	Testing and Disinfection	1	L.S.	$100,000	$100,000	
2.9	Stormwater Pollution Prevention Plan (SWPPP)	1	L.S.	$250,000	$250,000	
2.10	Revegatation/Landscape	1	L.S.	$100,000	$100,000	
2.11	Construction Access/Staging	1	L.S.	$840,000	$840,000	
2.12	Rock Excavation	9,600	C.Y.	$80	$768,000	
2.13	Culvert Crossing - Standard Construction	12	E.A.	$5,000	$57,500	
2.14	Fire Hydrants	48	E.A.	$6,000	$288,000	
.						
	Total Construction Cost of the Transmission Line					**$ 16,294,000**

Appendix C

New Water Source Matrix and Scoring Rationale

APPENDIX C - NON ECONOMIC EVALUATION - NEW WATER SOURCE

Criteria			Subcriteria			Subcriteria Metric				Matrix Weight	SOURCE ALTERNATIVES									
											A Area A Figure 3-2		B Area B Figure 3-2		C Area C Figure 3-2		D Area D Figure 3-2		Zone 4 Figure 3-2	
Criteria	Weight	Priority (%)	Sub criteria	Weight	Priority (%)	Metric	Weights	Priority (%)			Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Subsurface Conditions	10	16.0%	**Proximity to Areas with Acceptable Groundwater Quality**	10	25.0 %	Water Quality Data Available	5	100%		4.0	4	3.2	4	3.2	2	1.6	2	1.6	5	4.0
						Sub-total	**5**	**100%**		**4.0**		**3.2**		**3.2**		**1.6**		**1.6**		**4.0**
			Anticipated Depth-To-Water and Well Depth	7.5	18.8 %	Depth to Water	7.5	50%		1.5	5	1.5	5	1.5	1	0.3	5	1.5	5	1.5
						Depth of Well	7.5	50%		1.5	4	1.2	5	1.5	1	0.3	4	1.2	4	1.2
						Sub-total	**15**	**100%**		**3.0**		**2.7**		**3.0**		**0.6**		**2.7**		**2.7**
			Hydrogeologic Conditions Conducive to Providing Necessary Well Yield	10	25.0 %	Existing well data available to base yield estimates	7.5	43%		1.7	5	1.7	5	1.7	3	1.0	1	0.3	3	1.0
						Exploratory drilling program requirements	10	57%		2.3	5	2.3	3	1.4	3	1.4	3	1.4	4	1.8
						Sub-total	**17.5**	**100%**		**4.0**		**4.0**		**3.1**		**2.4**		**1.7**		**2.9**
			Geologic Material Where Secondary Permeability Provides Most of the Well Yield	7.5	18.8 %	Nearby wells produce water mainly from primary porosity of unconsolidated sediments	7.5	60%		1.8	5	1.8	4	1.4	1	0.4	2	0.7	4	1.4
						Title 22 capacity rating (alluvial vs. bedrock)	5	40%		1.2	5	1.2	4	1.0	1	0.2	2	0.5	4	1.0
						Sub-total	**12.5**	**100%**		**3.0**		**3.0**		**2.4**		**0.6**		**1.2**		**2.4**
			Location in Area in a Highly Exploited Portion of Aquifer	5	12.5 %	Historic groundwater usage	7.5	50%		1.0	4	0.8	5	1.0	1	0.2	3	0.6	3	0.6
						Water level trends, if known	7.5	50%		1.0	4	0.8	5	1.0	4	0.8	4	0.8	4	0.8
						Sub-total	**15**	**100%**		**2.0**		**1.6**		**2.0**		**1.0**		**1.4**		**1.4**
			Sub-total	**40**	**100.0 %**							**14.5**		**13.7**		**6.2**		**8.6**		**13.4**
Surface Conditions	7.5	12.0%	**Proximity to Springs and/or Other Surface Water Features, and Complies with TROA Guidelines(b) and General Guidelines of the MVGMP**	10	40.0 %	Affect on springs or streams, including Truckee River and tributaries	7.5	60%		2.9	3	1.7	1	0.6	5	2.9	3	1.7	4	2.3
						Compliance with TROA and MVGMP	5	40%		1.9	5	1.9	1	0.4	5	1.9	3	1.2	3	1.2
						Sub-total	**12.5**	**100%**		**4.8**		**3.6**		**1.0**		**4.8**		**2.9**		**3.5**
			Proximity to Private or Public Wells	7.5	30.0 %	Proximity to private or public wells	10	67%		2.4	5	2.4	5	2.4	1	0.5	5	2.4	5	2.4
						Mitigation required to reduce interference	5	33%		1.2	4	1.0	5	1.2	1	0.2	3	0.7	3	0.7
						Sub-total	**15**	**100%**		**3.6**		**3.4**		**3.6**		**0.7**		**3.1**		**3.1**
			Distance from Areas Potentially Inundated with Flood Water	2.5	10.0 %	Flood Plain Delineation	2.5	100%		1.2	5	1.2	1	0.2	5	1.2	5	1.2	5	1.2
						Sub-total	**2.5**	**100%**		**1.2**		**1.2**		**0.2**		**1.2**		**1.2**		**1.2**
			Distance from Sources of Possible Groundwater Contamination (Natural and Anthropogenic)	5	20.0 %	Distance to natural contamination	10	50%		1.2	4	1.0	1	0.2	4	1.0	4	1.0	5	1.2
						Distance to anthropogenic contamination	10	50%		1.2	2	0.5	1	0.2	5	1.2	4	1.0	4	1.0
						Sub-total	**20**	**100%**		**2.4**		**1.4**		**0.5**		**2.2**		**1.9**		**2.2**
			Sub-total	**25**	**100.0 %**							**9.6**		**5.3**		**8.9**		**9.1**		**9.9**
Water Quality	10	16.0%	**Water Quality Compared to Squaw Valley**	10	66.7 %	Primary Standards	10	33%		3.6	4	2.8	1	0.7	3	2.1	3	2.1	5	3.6
						Secondary Standards	10	33%		3.6	5	3.6	5	3.6	2	1.4	2	1.4	5	3.6
						Radionuclides	10	33%		3.6	5	3.6	5	3.6	2	1.4	2	1.4	5	3.6
						Sub-total	**30**	**100%**		**10.7**		**10.0**		**7.8**		**5.0**		**5.0**		**10.7**
			Level of Treatment Required	5	33.3 %	Chlorination	10	40%		2.1	4	1.7	5	2.1	4	1.7	4	1.7	4	1.7
						pH Adjustment	5	20%		1.1	5	1.1	5	1.1	3	0.6	3	0.6	3	0.6
						Fe, Mn, As, surface water, etc.	10	40%		2.1	4	1.7	1	0.4	3	1.3	3	1.3	5	2.1
						Sub-total	**25**	**100%**		**5.3**		**4.5**		**3.6**		**3.6**		**3.6**		**4.5**
			Sub-total	**15**	**100.0 %**							**14.4**		**11.4**		**8.6**		**8.6**		**15.1**
Environmental	7.5	12.0%	**Waters**	10	33.3 %	Waters of US	10	44%		1.8	3	1.1	5	1.8	4	1.4	2	0.7	2	0.7
						Waters of State	10	44%		1.8	3	1.1	5	1.8	4	1.4	2	0.7	2	0.7
						Stream Crossings	2.5	11%		0.4	5	0.4	5	0.4	5	0.4	5	0.4	5	0.4
						Sub-total	**22.5**	**100%**		**4.0**		**2.6**		**4.0**		**3.3**		**1.9**		**1.9**
			Biological Resources	10	33.3 %	Listed Species	10	40%		1.6	5	1.6	2	0.6	2	0.6	5	1.6	3	1.0
						Critical Habitat	10	40%		1.6	5	1.6	5	1.6	5	1.6	5	1.6	5	1.6
						Species of Concern	2.5	10%		0.4	4	0.3	4	0.3	4	0.3	5	0.4	4	0.3
						Woodlands	2.5	10%		0.4	5	0.4	4	0.3	2	0.2	2	0.2	3	0.2
						Sub-total	**25**	**100%**		**4.0**		**3.9**		**2.9**		**2.7**		**3.8**		**3.1**
			Cultural Resources	5	16.7 %	Proximity to Water	10	33%		0.7	2	0.3	3	0.4	5	0.7	5	0.7	2	0.3
						Slopes	10	33%		0.7	2	0.3	5	0.7	5	0.7	3	0.4	2	0.3
						Known Resources	10	33%		0.7	5	0.7	5	0.7	5	0.7	5	0.7	5	0.7
						Sub-total	**30**	**100%**		**2.0**		**1.2**		**1.7**		**2.0**		**1.7**		**1.2**
			Land Use	5	16.7 %	USFS Lands	10	29%		0.6	5	0.6	3	0.3	1	0.1	2	0.2	5	0.6
						Private Property	7.5	21%		0.4	5	0.4	4	0.3	3	0.3	3	0.3	1	0.1
						Caltrans ROW	2.5	7%		0.1	5	0.1	5	0.1	5	0.1	5	0.1	5	0.1
						Sensitive Receptors	7.5	21%		0.4	5	0.4	4	0.3	3	0.3	3	0.3	1	0.1
						Traffic	2.5	7%		0.1	5	0.1	5	0.1	5	0.1	5	0.1	5	0.1
						Air Quality/Green House Gases	5	14%		0.3	5	0.3	5	0.3	5	0.3	5	0.3	5	0.3
						Sub-total	**35**	**100%**		**2.0**		**2.0**		**1.6**		**1.2**		**1.3**		**1.3**
			Sub-total	**30**	**100.0 %**							**9.7**		**10.2**		**9.2**		**8.7**		**7.5**
Public/Regional Impacts	5	8.0%	**Potential for Opposition**	10	33.3 %	Consideration to traffic, noise, air quality impacts	5	22%		0.6	5	0.6	5	0.6	3	0.4	3	0.4	3	0.4
						Proximity to residences/commercial properties	10	44%		1.2	5	1.2	4	0.9	3	0.7	3	0.7	3	0.7
						Potential impacts to private property	7.5	33%		0.9	5	0.9	4	0.7	3	0.5	3	0.5	3	0.5
						Sub-total	**22.5**	**100%**		**2.7**		**2.7**		**2.3**		**1.6**		**1.6**		**1.6**
			Aesthetic Impacts	7.5	25.0 %	Short term construction impacts (drilling, grading, staging areas)	10	67%		1.3	5	1.3	5	1.3	3	0.8	3	0.8	3	0.8
						Long term impacts (construction of well house, removal of vegetation, visibility of appurtenances)	5	33%		0.7	4	0.5	5	0.7	3	0.4	3	0.4	3	0.4
						Sub-total	**15**	**100%**		**2.0**		**1.9**		**2.0**		**1.2**		**1.2**		**1.2**
			Potential Regional Benefits	5	16.7 %	Supplemental source for existing water system (TDPUD, NCSD)	10	100%		1.3	5	1.3	5	1.3	5	1.3	5	1.3	5	1.3
						Sub-total	**10**	**100%**		**1.3**		**1.3**		**1.3**		**1.3**		**1.3**		**1.3**
			Agency Cooperation/Dependence	7.5	25.0 %	Reliance on neighboring agencies for use of existing infrastructure	7.5	100%		2.0	4	1.6	5	2.0	4	1.6	4	1.6	4	1.6
						Sub-total	**7.5**	**100%**		**2.0**		**1.6**		**2.0**		**1.6**		**1.6**		**1.6**
			Sub-total	**30**	**100.0 %**							**7.5**		**7.6**		**5.7**		**5.7**		**5.7**
ROW Requirements	5	8.0%	**Permanent Easements**	10	80.0 %	Probability of Obtaining an Easement	10	33%		2.1	5	2.1	4	1.7	3	1.3	3	1.3	1	0.4
						Cost of Obtaining an Easement	10	33%		2.1	5	2.1	4	1.7	3	1.3	3	1.3	3	1.3
						% within Existing ROW/PUE Easement	5	17%		1.1	5	1.1	5	1.1	5	1.1	5	1.1	5	1.1
						Public or Private easement	5	17%		1.1	5	1.1	5	1.1	5	1.1	5	1.1	5	1.1
						Sub-total	**30**	**100%**		**6.4**		**6.4**		**5.5**		**4.7**		**4.7**		**3.8**
			Temporary Construction Easements	2.5	20.0 %	Ability to secure temporary construction easements	2.5	100%		1.6	5	1.6	4	1.3	3	1.0	3	1.0	1	0.3
						Sub-total	**2.5**	**100%**		**1.6**		**1.6**		**1.3**		**1.0**		**1.0**		**0.3**
			Sub-total	**12.5**	**100.0 %**							**8.0**		**6.8**		**5.7**		**5.7**		**4.2**
O & M	7.5	12.0%	**Accessibility**	7.5	37.5 %	Remote Locations	10	44%		2.0	5	2.0	5	2.0	2	0.8	2	0.8	5	2.0
						Paved Road v. Dirt Road	7.5	33%		1.5	5	1.5	3	0.9	2	0.6	2	0.6	5	1.5
						Type of Vehicle Access: Snow Cat, ATV, Light Truck, etc.	5	22%		1.0	5	1.0	5	1.0	2	0.4	2	0.4	5	1.0
						Sub-total	**22.5**	**100%**		**4.5**		**4.5**		**3.9**		**1.8**		**1.8**		**4.5**
			Level of Treatment Required	7.5	37.5 %	Type of treatment processes	10	100%		4.5	5	4.5	1	0.9	3	2.7	3	2.7	5	4.5
						Sub-total	**10**	**100%**		**4.5**		**4.5**		**0.9**		**2.7**		**2.7**		**4.5**
			Impacts from Repair and Maintenance	5	25.0 %	Pedestrian/Public Impacts	10	100%		3.0	5	3.0	5	3.0	3	1.8	3	1.8	3	1.8
						Sub-total	**10**	**100%**		**3.0**		**3.0**		**3.0**		**1.8**		**1.8**		**1.8**
			Sub-total	**20**	**100.0 %**							**12.0**		**7.8**		**6.3**		**6.3**		**10.8**
Engineering	10	16.0%	**Constructability**	10	50.0 %	Material Staging	10	36%		2.9	5	2.9	4	2.3	3	1.7	3	1.7	1	0.6
						Drilling equipment and construction vehicle access	10	36%		2.9	5	2.9	3	1.7	2	1.2	2	1.2	5	2.9
						Development and testing residuals and water disposal	7.5	27%		2.2	5	2.2	3	1.3	2	0.9	2	0.9	5	2.2
						Sub-total	**27.5**	**100%**		**8.0**		**8.0**		**5.4**		**3.8**		**3.8**		**5.7**
			Power Supply	10	50.0 %	Location of Available power supply	10	100%		8.0	5	8.0	5	8.0	2	3.2	2	3.2	5	8.0
						Sub-total	**10**	**100%**		**8.0**		**8.0**		**8.0**		**3.2**		**3.2**		**8.0**
			Sub-total	**20**	**100.0 %**							**16.0**		**13.4**		**7.0**		**7.0**		**13.7**
Total	**62.5**	**100%**							**Total**			**91.7**		**76.2**		**57.6**		**59.7**		**80.3**

Weight = value assigned to given criterion (or sub criterion) with respect to other criteria (or sub criteria).

Priority = the value of weights after normalization.

Matrix Weight = the metric priority multiplied by the criterion priority.

APPENDIX C - NEW WATER SOURCE RATIONALE

Subsurface Conditions Subcriteria - Proximity to Areas with Acceptable Groundwater Quality and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Water Quality Data Available (MW = 4.0)			
Area A	Airport Well WQ available	4	3.2
Area B	Water quality data available from Northside Well, and Donner Creek Well	4	3.2
Area C	Data available only from wells to the east	2	1.6
Area D	Data available only from wells to the east	2	1.6
Zone 4	Data available from multiple wells in the area	5	4.0

Subsurface Conditions Subcriteria - Anticipated Depth-To-Water and Well Depth and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Depth to Water (MW = 1.5)			
Area A	Reasonable depth-to-water	5	1.5
Area B	Depth-to-water of Northside Well is approx. 103-191 fbls, more shallow at Donner Creek Well	5	1.5
Area C	Highest elevation site, likely deep depth-to-water (>200-300 ft)	1	0.3
Area D	Reasonable depth-to-water	5	1.5
Zone 4	Reasonable depth-to-water	5	1.5
Depth to Well (MW = 1.5)			
Area A	Probably similar to other Zone 4 wells	4	1.2
Area B	Shallowest wells of all areas likely	5	1.5
Area C	Wells may need to be >1,000 ft for desired yield	1	0.3
Area D	Probably similar to other Zone 4 wells	4	1.2
Zone 4	Most production wells in the area are approx. 1000 ft. deep	4	1.2

Subsurface Conditions Subcriteria - Hydrogeologic Conditions Conducive to Providing Necessary Well Yield and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Existing well data available to base yield estimates (MW = 1.7)			
Area A	Likely favorable conditions similar to Zone 4 Wells	5	1.7
Area B	Nearby Northside well indicates potential good yield	5	1.7
Area C	Wells to the east (Lahontan #2, Lahontan #1, Schaffer Mill #3, Eaglewood #2) indicate good yield probability (>1,000 gpm)	3	1.0
Area D	Possibly similar to high yield wells to the east such as Martis Camp	1	0.3
Zone 4	Likely favorable conditions similar to Zone 4 Wells	3	1.0
Exploratory drilling program requirements (MW = 2.3)			
Area A	Area is likely similar to Airport Well and Brockway Test Hole	5	2.3
Area B	Area likely to require drilling a test well	3	1.4
Area C	Area likely to require drilling a test well	3	1.4
Area D	Area likely to require drilling a test well	3	1.4
Zone 4	Depending on location, a test well may be	4	1.8

Subsurface Conditions Subcriteria - Geologic Material Where Secondary Permeability Provides Most of the Well Yield and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Nearby wells produce water mainly from primary porosity of unconsolidated sediments (MW = 1.8)			
Area A	Alluvial material is present	5	1.8
Area B	Both alluvial and volcanic rocks are present	4	1.4
Area C	Abundant (>500 ft?) volcanics may be present	1	0.4
Area D	Both alluvial and volcanic rocks are present, location is west of a structural basin that may have more alluvium than present in the area	2	0.7
Zone 4	Both alluvial and volcanic rocks are present	4	1.4
Title 22 capacity rating (alluvial vs. bedrock) (MW = 1.2)			
Area A	Based on Airport Well, alluvial material	5	1.2
Area B	Unlikely to need Title 22 testing for hard rock aquifers	4	1.0
Area C	Possible thick (>500 ft.) of volcanics overlying sediments	1	0.2
Area D	Some chance of Title 22 testing requirements if volcanics are thick at this location	2	0.5
Zone 4	Area could be selected to minimize the amount of volcanics	4	1.0

Subsurface Conditions Subcriteria - Location in Area in a Highly Exploited Portion of Aquifer and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Historic Groundwater Usage (MW = 1.0)			
Area A	Only one other production well nearby	4	0.8
Area B	Area receives relatively little groundwater use	5	1.0
Area C	High density of municipal and golf course wells to the east	1	0.2
Area D	Area currently utilized for municipal, golf course use.	3	0.6
Zone 4	Area currently utilized for municipal, golf course use.	3	0.6
Water level Trends, if known (MW = 1.0)			
Area A	30 foot decline since 1990 according to DNR Well 393072N1201315W001	4	0.8
Area B	Stable water level trends according to DNR Well 393227N1202283W001	5	1.0
Area C	Operator records indicate reasonably stable water levels in wells to the east	4	0.8
Area D	Operator records indicate reasonably stable water levels in wells to the northeast	4	0.8
Zone 4	Water level trends are assumed to be reasonably stable	4	0.8

Surface Conditions Subcriteria - Proximity to Springs and/or Other Surface Water Features, and Complies with TROA Guidelines (b) and General Guidelines of the MVGMP and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Affect on springs or streams, includingTruckee River and Tributaries (MW = 2.9)			
Area A	Possible Effect of Joerger Ranch Spring	3	1.7
Area B	Possible effect to Donner Creek/Truckee	1	0.6
Area C	No springs or streams nearby	5	2.9
Area D	Possible effect on Martis Creek, closest area to Martis Creek, possible effect on Sheepherder Spring (TDPUD water right, located 1.1 miles west)	3	1.7
Zone 4	Possible effect on Martis Creek	4	2.3
Compliance with TROA and MVGMP (MW = 1.9)			
Area A	Outside TROA setbacks and complies with spirt of MVGMP	5	1.9
Area B	Some portions of this zone would fall within the TROA setback and seal depth requirements - Donner Creek and Truckee	1	0.4
Area C	Outside TROA setbacks and complies with spirt of MVGMP	5	1.9
Area D	TROA limitations in close proximity to Martis Creek	3	1.2
Zone 4	TROA limitations in close proximity to Martis Creek	3	1.2

Surface Conditions Subcriteria - Proximity to Private or Public Wells and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Proximity to private or public wells (MW = 2.4)			
Area A	Area served by public water system, impacts to any domestic wells unlikely	5	2.4
Area B	Area served by public water system, impacts to any domestic wells unlikely	5	2.4
Area C	Area served by public water system, impacts to any domestic wells unlikely, dense municipal wells to east	1	0.5
Area D	Area served by public water system, impacts to any domestic wells unlikely	5	2.4
Zone 4	Area served by public water system, impacts to any domestic wells unlikely	5	2.4
Mitigation required to reduce interference (MW = 1.2)			
Area A	Some cooperation between agencies may be necessary to prevent water level declines due to wells in proximity	4	1.0
Area B	Mitigation unlikely	5	1.2
Area C	Some cooperation between agencies may be necessary to prevent water level declines due to wells in proximity, highest density of wells	1	0.2
Area D	Some cooperation between agencies may be necessary to prevent water level declines due to wells in proximity	3	0.7
Zone 4	Some cooperation between agencies may be necessary to prevent water level declines due to wells in proximity	3	0.7

Surface Conditions Subcriteria - Distance froim Areas Potentially Inundated with Flood Water and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Flood Plain Delineation (MW = 1.2)			
Area A	Outside of all flood zones	5	1.2
Area B	Only the western portion of Area B is within the floodplain of Donner Creek	1	0.2
Area C	Outside of all flood zones	5	1.2
Area D	Outside of all flood zones	5	1.2
Zone 4	Likely target areas outside of flood zones	5	1.2

Surface Conditions Subcriteria - Distance from Sources of Possible Groundwater Contamination (Natural and Anthropogenic) and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Distance to natural contamination (MW = 1.2)			
Area A	2014 Sampling of airport well = 9.9 ppb As	4	1.0
Area B	Arsenic and Radon reported for Northside Well	1	0.2
Area C	Water quality unknown, nearest wells meet standards	4	1.0
Area D	Water quality unknown, nearest wells meet standards	4	1.0
Zone 4	Meets Drinking Water Standards	5	1.2
Distance to anthropogenic contamination (MW = 1.2)			
Area A	PCS: sewer collection systems, golf course, airport/hanger/fuel storage, mod. density housing, gas station, mod density commercial, swimming pool, Hwy 267	2	0.5
Area B	PCS: sewer collection systems, lumber yard, auto repair (body shop), moderately dense industrial district/office complexes, RV park, Interstate 80, Hwy 89	1	0.2
Area C	PCS: sewer collection systems, golf course	5	1.2
Area D	PCS: sewer collection systems, golf course, low density housing, swimming pools, restaurant/club house	4	1.0
Zone 4	PCS: sewer collection system, low density housing	4	1.0

PCS = potential contaminant source

Water Quality Subcriteria - Water Quality Compared to Squaw Valley and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Primary Standards (MW = 3.6)			
Area A	Assumed similar to TDPUD Airport Well which currently meets all primary WQ standards Airport well Arsenic concentration = 9.9 ppb	4	2.8
Area B	Nearby TDPUD Donner Creek well is subject to surface water treatment requirements Nearby Northside well exceeds Arsenic MCL	1	0.7
Area C	Adjacent water quality in Zone 4 wells meets all SDWA standards Water quality in well on USFS lands is unknown	3	2.1
Area D	Adjacent water quality in Zone 4 wells meets all SDWA standards Water quality in well on USFS lands is unknown	3	2.1
Zone 4	Assumed similar to existing Martis Valley water system wells which currently meets all primary WQ standards	5	3.6
Secondary Standards (MW = 3.6)			
Area A	Assumed similar to TDPUD Airport Well which currently meets all secondary WQ standards	5	3.6
Area B	Nearby Northside well currently meets all secondary WQ standards	5	3.6
Area C	Adjacent water quality in Zone 4 wells meets all SDWA standards Water quality in well on USFS lands is unknown	2	1.4
Area D	Adjacent water quality in Zone 4 wells meets all SDWA standards Water quality in well on USFS lands is unknown	2	1.4
Zone 4	Assumed similar to existing Martis Valley water system wells which currently meets all secondary WQ standards	5	3.6
Radionuclides (MW = 3.6)			
Area A	Assumed similar to TDPUD Airport Well which currently meets all radionuclide WQ standards	5	3.6
Area B	Nearby Northside well currently meets all radionuclide WQ standards	5	3.6
Area C	Adjacent water quality in Zone 4 wells meets all SDWA standards Water quality in well on USFS lands is unknown	2	1.4
Area D	Adjacent water quality in Zone 4 wells meets all SDWA standards Water quality in well on USFS lands is unknown	2	1.4
Zone 4	Assumed similar to existing Martis Valley water system wells which currently meets all radionuclide WQ standards	5	3.6

Water Quality Subcriteria - Level of Treatment Required and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Chlorination (MW = 2.1)			
Area A	Source wheeled through other system Chlorination as required to satisfy NCSD and/or TDPUD Chlorination required for pipeline bacteriological water quality maintenance	4	1.7
Area B	Source may not require wheeling through TDPUD system Chlorination required for pipeline bacteriological water quality maintenance	5	2.1
Area C	Source wheeled through other system Chlorination as required to satisfy NCSD and/or TDPUD Chlorination required for pipeline bacteriological water quality maintenance	4	1.7
Area D	Source wheeled through other system Chlorination as required to satisfy NCSD and/or TDPUD Chlorination required for pipeline bacteriological water quality maintenance	4	1.7
Zone 4	Source wheeled through other system Chlorination as required to satisfy NCSD and/or TDPUD Chlorination required for pipeline bacteriological water quality maintenance	4	1.7
pH Adjustment (MW = 1.1)			
Area A	Airport pH = 8.1 No pH adjustment appears to be required	5	1.1
Area B	Northside pH = 8.3 No pH adjustment appears to be required	5	1.1
Area C	Unknown	3	0.6
Area D	Unknown	3	0.6
Zone 4	Unknown	3	0.6
Fe, Mn, As, surface water, etc. (MW = 2.1)			
Area A	Assumed similar to TDPUD Airport Well which currently meets all primary WQ standards Airport well Arsenic concentration = 9.9 ppb Assume blending with TDPUD would provide compliance with As MCL	4	1.7
Area B	Nearby TDPUD Donner Creek well is subject to surface water treatment requirements Nearby Northside well exceeds Arsenic MCL	1	0.4
Area C	Unknown	3	1.3
Area D	Unknown	3	1.3
Zone 4	Assumed similar to existing Martis Valley water system wells which currently does not require treatment	5	2.1

Enviromental Subcriteria - Waters and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Water of US (MW = 1.8)			
Area A	Drainage and Martis lake floodplain through middle, southern edge, and northeastern corner of area - NWI identified adjacent to eastern well	3	1.1
Area B	Truckee River to southeast boundary, creek on western border	5	1.8
Area C	streams in northern and southern areas, avoidable	4	1.4
Area D	several streams and NWI identified wetland on south side	2	0.7
Zone 4	martis creek and multiple tributaries -- existing system and designated well site	2	0.7
Waters of State (MW = 1.8)			
Area A	Drainage and Martis lake floodplain through middle, southern edge, and northeastern corner of area - NWI identified	3	1.1
Area B	Truckee River to southeast boundary, creek on western border	5	1.8
Area C	streams in northern and southern areas, avoidable	4	1.4
Area D	several streams and NWI identified wetland on south side	2	0.7
Zone 4	martis creek and multiple tributaries -- existing system and designated well site	2	0.7
Stream Crossings (MW = 0.4)			
Area A	avoidable impact	5	0.4
Area B	avoidable impact	5	0.4
Area C	avoidable impact	5	0.4
Area D	avoidable impact	5	0.4
Zone 4	avoidable impact	5	0.4

Enviromental Subcriteria - Biological Resources and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Listed Species (MW = 1.6)			
Area A	no state or federal listed species	5	1.6
Area B	1 federal candidate, 2 state endangered	2	0.6
Area C	1 federal candidate, 2 state endangered in very northern portion	2	0.6
Area D	no state or federal listed species	5	1.6
Zone 4	1 federally threatened -- existing system and designated well site	3	1.0
Critical Habitat (MW = 1.6)			
Area A	No critical habitat	5	1.6
Area B	No critical habitat	5	1.6
Area C	No critical habitat	5	1.6
Area D	No critical habitat	5	1.6
Zone 4	No critical habitat	5	1.6
Species of Concern (MW = 0.4)			
Area A	1 species in northern portion by businesses, can be sited around/has lower potential for occurrence	4	0.3
Area B	5 species in eastern portion of area can be	4	0.3
Area C	5 species in northern tip can be sited around/has lower potential for occurrence	4	0.3
Area D	no occurences	5	0.4
Zone 4	2 species existing system and designated well site can be sited around/has lower potential for occurence	4	0.3
Woodlands (MW = 0.4)			
Area A	low density scattered trees 25% forested,	5	0.4
Area B	40% forested, some disturbed and open areas	4	0.3
Area C	85% forested	2	0.2
Area D	90% forested	2	0.2
Zone 4	70% forested	3	0.2

Enviromental Subcriteria - Cultural Resources and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Proximity to Water (MW = 0.7)			
Area A	floodplain, near lake and water	2	0.3
Area B	River and Creek nearby, separated by RR and on the hill	3	0.4
Area C	on a hill above water	5	0.7
Area D	multiple creeks, mostly upland hills	5	0.7
Zone 4	martis lake, creek, and existing streams	2	0.3
Slopes (MW = 0.7)			
Area A	relatively flat with rolling hills	2	0.3
Area B	steeper hills	5	0.7
Area C	sits on a bluff, slight hills mostly flatter	5	0.7
Area D	rolling hills	3	0.4
Zone 4	mostly flat/ rolling hills	2	0.3
Known Resources (MW = 0.7)			
Area A	no surveys available	5	0.7
Area B	no surveys available	5	0.7
Area C	no surveys available	5	0.7
Area D	no surveys available	5	0.7
Zone 4	no surveys available	5	0.7

Enviromental Subcriteria - Land Use and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
USFS Lands (MW = 0.6)			
Area A	Town of Truckee/Nevada and Placer County - no USFS land	5	0.6
Area B	mostly in nevada county/town of Truckee, southern tip in USFS	3	0.3
Area C	85% USFS land	1	0.1
Area D	65% USFS land, private with golf course	2	0.2
Zone 4	none	5	0.6
Private Property (MW = 0.4)			
Area A	Well would be drilled on private property Zoning is Conservation Preserve which doesn't allow SFR/commercial construction but does allow utilities	5	0.4
Area B	mostly private property, UPRR easement, Sierra College, some residences, industrail/commercial uses	4	0.3
Area C	Mostly USFS, some private residential property in northeastern corner	3	0.3
Area D	Mostly USFS land, private residential areas with golf course	3	0.3
Zone 4	mostly private residential areas, golf course	1	0.1

Caltrans ROW (MW = 0.1)			
Area A	Hwy 267 runs through but can be avoided	5	0.1
Area B	none	5	0.1
Area C	none	5	0.1
Area D	none	5	0.1
Zone 4	includes a portion of hwy 267, but can be avoided	5	0.1
Sensitive Receptors (MW = 0.4)			
Area A	homes/businesses in northern section - impacts would be minimal - very few homes nearby - impacts would be minimal	5	0.4
Area B	mobile home park, college - impacts would be minimal	4	0.3
Area C	Impacts would be greatest for well sites adjacent to residential areas Impacts on USFS land limited to construction near USFS 06 Road	3	0.3
Area D	Impacts would be greatest for well sites adjacent to residential areas Impacts on USFS land limited to construction near USFS 06 Road	3	0.3
Zone 4	Impacts would be greatest for well sites adjacent to residential areas	1	0.1
Traffic (MW = 0.1)			
Area A	avoidable impacts if any	5	0.1
Area B	avoidable impacts if any	5	0.1
Area C	avoidable impacts if any	5	0.1
Area D	avoidable impacts if any	5	0.1
Zone 4	avoidable impacts if any	5	0.1
Air Quality/Greenhouse Gases (MW = 0.3)			
Area A	construction time to drill the well	5	0.3
Area B	construction time to drill the well	5	0.3
Area C	construction time to drill the well	5	0.3
Area D	construction time to drill the well	5	0.3
Zone 4	construction time to drill the well	5	0.3

Public & Regional Impacts Subcriteria - Potential for Opposition and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Consideration to traffic, noise, air quality impacts (MW = 0.6)			
Area A	Potential well location near highway 267 and airport Negligible impacts due to location and surrounding land use	5	0.6
Area B	Located on commercial corridor bordered by West River St and US 80 Negligible impacts due to location and surrounding land use	5	0.6
Area C	Potential well location in Sierra Meadows subdivision	3	0.4
Area D	Potential well location in Martis Camp subdivision	3	0.4
Zone 4	Potential well location in Lahontan, Martis Camp and Schaffer's Mill subdivisions	3	0.4
Proximity to residences (MW = 1.2)			
Area A	Potential well location near highway 267 and airport	5	1.2
Area B	Located on commercial corridor bordered by West River St and US 80	4	0.9
Area C	Potential well location in Sierra Meadows subdivision	3	0.7
Area D	Potential well location in Martis Camp subdivision	3	0.7
Zone 4	Potential well location in Lahontan, Martis Camp and Schaffer's Mill subdivisions	3	0.7
Potential impacts to private property (MW = 0.9)			
Area A	Property owned by airport authority zoned Open Space Property owned by DMB/Highlands Group LLC zoned Open Space Zoning signifies little impact to private property due to well house	5	0.9
Area B	North of RR tracks property owned by Sierra Community College District South of RR tracks property owned by private parties zoned commercial/industrial Zoning signifies little impact to private property due to well house	4	0.7
Area C	Residential neighborhood with limited vacant area conducive to a well house	3	0.5
Area D	Residential neighborhood with limited vacant area conducive to a well house	3	0.5
Zone 4	Residential neighborhood with limited vacant area conducive to a well house	3	0.5

Public & Regional Impacts Subcriteria - Aesthetic Impacts and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Short Term construction impacts (grading, staging areas) (MW = 1.3)			
Area A	Drilling equipment and well house construction is similar for all alternatives Short term impacts are reduced in non-residential areas	5	1.3
Area B	Drilling equipment and well house construction is similar for all alternatives Short term impacts are reduced in non-residential areas	5	1.3
Area C	Drilling equipment and well house construction is similar for all alternatives Short term impacts are increased with closer proximity to residential land uses	3	0.8
Area D	Drilling equipment and well house construction is similar for all alternatives Short term impacts are increased with closer proximity to residential land uses	3	0.8
Zone 4	Drilling equipment and well house construction is similar for all alternatives Short term impacts are increased with closer proximity to residential land uses	3	0.8
Long Tern impacts (change in topography, removal of vegetation, visibility of appurtenances) (MW = 0.7)			
Area A	Highly visible area which will require significant mitigation measures	4	0.5
Area B	Corridor provides the least site and architectural considerations	5	0.7
Area C	Construction of well house in residential areas will require more significant site and architerctural mitigation measures	3	0.4
Area D	Construction of well house in residential areas will require more significant site and architerctural mitigation measures	3	0.4
Zone 4	Construction of well house in residential areas will require more significant site and architerctural mitigation measures	3	0.4

Public & Regional Impacts Subcriteria - Potential Regional Benefits and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Supplemental source for existing water system (TDPUD, NCSD) (MW = 1.3)			
Area A	Alternative has the potential to provide suppmlemental capacity and operational flexibility to NCSD and/or TDPUD when District is not pumping full redundant water demand	5	1.3
Area B	Alternative has the potential to provide suppmlemental capacity and operational flexibility to NCSD and/or TDPUD when District is not pumping full redundant water demand	5	1.3
Area C	Alternative has the potential to provide suppmlemental capacity and operational flexibility to NCSD and/or TDPUD when District is not pumping full redundant water demand	5	1.3
Area D	Alternative has the potential to provide suppmlemental capacity and operational flexibility to NCSD and/or TDPUD when District is not pumping full redundant water demand	5	1.3
Zone 4	Alternative has the potential to provide suppmlemental capacity and operational flexibility to NCSD and/or TDPUD when District is not pumping full redundant water demand	5	1.3

Public & Regional Impacts Subcriteria - Agency Cooperation/Dependence and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Reliance on neighboring agencies for water supply and use of existing infrastructure (MW = 2.0)			
Area A	Site will require cooperation from NCSD and/or TDPUD	4	1.6
Area B	Only alternative which can provide a standalone water supply for the district	5	2.0
Area C	Site will require cooperation from NCSD and/or TDPUD	4	1.6
Area D	Site will require cooperation from NCSD and/or TDPUD	4	1.6
Zone 4	Site will require cooperation from NCSD and/or TDPUD	4	1.6

ROW Requirements Subcriteria - Permanent Easements and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Probability of Obtaining an Easement (MW = 2.1)			
Area A	Potential well locations are either Airport Authority property or DMB Highlands property	5	2.1
Area B	Potential well locations are either Sierra College property or commercial corridor south of RR tracks	4	1.7
Area C	Potential well location is on USFS property or in Sierra Meadows or Schaffer Mill residential area Probability of obtaining easement better on Federal lands	3	1.3
Area D	Potential well location is on USFS property or in Martis Camp residential area Probability of obtaining easement better on Federal lands	3	1.3
Zone 4	Well locations will require private easement	1	0.4
Cost of Obtaining an Easement (MW = 2.1)			
Area A	Assume Airport Authority property will be fair price Assume DMB/Highlands easement will be fair price as it is zoned Open Space	5	2.1
Area B	There is ample open space on College property; assume fair price Commercial corridor along West River is all private land; cost for an easement will likely be a bit higher	4	1.7
Area C	Cost to obatin easement in residential areas will likely be high	3	1.3
Area D	Cost to obatin easement in residential areas will likely be high	3	1.3
Zone 4	Cost to obatin easement in residential areas will likely be high	3	1.3

% within Existing ROW/PUE Easement (MW = 1.1)			
Area A	Dependent on well location Most, if not all, utilities will be on private property	5	1.1
Area B	Dependent on well location Most, if not all, utilities will be on private property	5	1.1
Area C	Dependent on well location Most, if not all, utilities will be on private property	5	1.1
Area D	Dependent on well location Most, if not all, utilities will be on private property	5	1.1
Zone 4	Dependent on well location Most, if not all, utilities will be on private property	5	1.1
Public or Private Easement (MW = 1.1)			
Area A	Dependent on well location Most, if not all, utilities will require private easement	5	1.1
Area B	Dependent on well location Most, if not all, utilities will require private easement	5	1.1
Area C	Dependent on well location Most, if not all, utilities will require private easement	5	1.1
Area D	Dependent on well location Most, if not all, utilities will require private easement	5	1.1
Zone 4	Dependent on well location Most, if not all, utilities will require private easement	5	1.1

ROW Requirements Subcriteria - Temporary Construction Easements and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Ability to secure temporary construction easements (MW = 1.6)			
Area A	There is plenty of open space in this area Anticipated that securing large enough temporary easements will be acceptable to property owners	5	1.6
Area B	There is plenty of open space in this area Anticipated that securing large enough temporary easements will be acceptable to property owners Temporary easement in commercial corridor would likely be more costly than in College property	4	1.3
Area C	Temporary easements for well sites within residential areas will likely be higher in cost and more difficult to negotiate Temporary easements on USFS lands would likely be more acceptable	3	1.0
Area D	Temporary easements for well sites within residential areas will likely be higher in cost and more difficult to negotiate Temporary easements on USFS lands would likely be more acceptable	3	1.0
Zone 4	Temporary easements for well sites within residential areas will likely be higher in cost and more difficult to negotiate	1	0.3

Operations & Maintenance Subcriteria - Accessibility and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Remote Locations (MW = 2.0)			
Area A	Access in this area is not restricted	5	2.0
Area B	Access in this area is not restricted	5	2.0
Area C	If located in USFS 06 Road, access is more remote Access to USFS 06 Road sometimes restricted during wet road conditions Well location in residential area poses no access restrictions	2	0.8
Area D	If located in USFS 06 Road, access is more remote Access to USFS 06 Road sometimes restricted during wet road conditions Well location in residential area poses no access restrictions	2	0.8
Zone 4	Well location in residential area poses no access restrictions	5	2.0
Paved Road vs. Dirt Road (MW = 1.5)			
Area A	Primary access is Highway 267 and Schaffer Mill Rd.	5	1.5
Area B	Primary access is West River St. for commercial corridor There is a well graded dirt access road that accesses the College property off of McIver Crossing road	3	0.9
Area C	If well location is USFS property, then access is dirt USFS 06 Road If located in residential area, then acces is mostly paved	2	0.6
Area D	If well location is USFS property, then access is dirt USFS 06 Road If located in residential area, then acces is mostly paved	2	0.6
Zone 4	Acces is mostly paved in residential areas	5	1.5

Type of Vehicle Access (MW = 1.0)			
Area A	Any type of vehicle can access this site	5	1.0
Area B	Any type of vehicle can access this site	5	1.0
Area C	If located in USFS 06 Road, access would require 4WD or ATV/snowcat depending on winter/wet conditions Well location in residential area poses no vehicle access restrictions	2	0.5
Area D	If located in USFS 06 Road, access would require 4WD or ATV/snowcat depending on winter/wet conditions Well location in residential area poses no vehicle access restrictions	2	0.4
Zone 4	Well location in residential area poses no vehicle access restrictions	5	1.0

Operations & Maintenance Subcriteria - Level of Treatment Required and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Type of Treatment Processes (MW = 4.5)			
Area A	Water quality in this area appears to meet all SDWA standards	5	4.5
Area B	Northside well excedds As MCL Donner Creek well subject to surface water treatment requirements	1	0.9
Area C	Adjacent water quality in Zone 4 wells meets all SDWA standards Water quality in well on USFS lands is unknown	3	2.7
Area D	Adjacent water quality in Zone 4 wells meets all SDWA standards Water quality in well on USFS lands is unknown	3	2.7
Zone 4	Water quality in this area appears to meet all SDWA standards	5	4.5

Operations & Maintenance Subcriteria - Impacts from Repair and Maintenance and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Pedestrian/Public Impacts (MW = 3.0)			
Area A	Impacts from major maintenance activities in this area poses a lesser level of pedestrian/public impacts	5	3.0
Area B	Impacts from major maintenance activities in commercial areaposes a lesser level of pedestrian/public impacts	5	3.0
Area C	Impacts from major maintenance activities in residential area poses a higher level of pedestrian/public impacts	3	1.8
Area D	Impacts from major maintenance activities in residential area poses a higher level of pedestrian/public impacts	3	1.8
Zone 4	Impacts from major maintenance activities in residential area poses a higher level of pedestrian/public impacts	3	1.8

Engineering Subcriteria - Constructability and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Material Staging (MW = 2.9)			
Area A	The potential parcels in this area are unoccupied and appear to have ample room for material staging	5	2.9
Area B	Well locations on the College property would likely be in open space area thus ample room for material staging Depending on the parcel, a well location on a commercial property may have more limited staging area	4	2.3
Area C	Wells in residential areas assumed to have less open space for material staging If well is located on USFS lands, then more material staging area would likely be	3	1.7
Area D	Wells in residential areas assumed to have less open space for material staging If well is located on USFS lands, then more material staging area would likely be	3	1.7
Zone 4	Wells in residential areas assumed to have less open space for material staging	1	0.6
Drilling equipment and construction vehicle acess (MW = 2.9)			
Area A	Access to this area is from Highway 267 and Schaffer Mill Rd. Drill sites are easily accessible in this area	5	2.9
Area B	Access to the commercial corridor allows for good access Access to the College property would be through the College or the dirt access road; both of which pose no restrictions to drilling equipment access	3	1.7
Area C	Drilling equipment access to well sites on USFS 06 Rd. will be more difficult Access to sites in the residential area pose no restrictions	2	1.2
Area D	Drilling equipment access to well sites on USFS 06 Rd. will be more difficult Access to sites in the residential area pose no restrictions	2	1.2
Zone 4	Access to sites in the residential area pose no restrictions	5	2.9

Development and testing residuals and water disposal (MW = 2.2)			
Area A	There is ample space available for onsite storage of development and testing residuals Sanitary sewer is local to this area for testing water disposal	5	2.2
Area B	There is ample space available for onsite storage of development and testing residuals Sanitary sewer is local to this area for testing water disposal in the commercial area Sewer is available on the College property, but longer discharge piping would be required to reach it	3	1.3
Area C	In residential area, sewer is available for testing water disposal More limited space likely available for onsite residuals storage Well sites on USFS property would require onsite storage and trucking for disposal of testing water, or long pipeline for discharge to sewer in Zone 4 sewer system	2	0.9
Area D	In residential area, sewer is available for testing water disposal More limited space likely available for onsite residuals storage Well sites on USFS property would require onsite storage and trucking for disposal of testing water, or long pipeline for discharge to sewer in Zone 4 sewer system	2	0.9
Zone 4	In residential area, sewer is available for testing water disposal More limited space likely available for onsite residuals storage	5	2.2

Engineering Subcriteria - Power Supply and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Location of available power supply (MW = 8.0)			
Area A	Power supply is readily available in this area	5	8.0
Area B	Power supply is readily available in this area	5	8.0
Area C	Power supply is readily available in the residential area Power is more remotely available if well constructed on USFS lands	2	3.2
Area D	Power supply is readily available in the residential area Power is more remotely available if well constructed on USFS lands	2	3.2
Zone 4	Power supply is readily available in this area	5	8.0

Appendix D

New Water Source Construction Cost Estimate

New Water Source Planning Level Cost Estimate

Item No.	Description	Qty.	Unit	Unit Cost	Cost	
1.0	**Mobilization/Demobilization**					
1.1	Mobilization/Demobilization	1	L.S.	$75,000	$75,000	
2.0	**Capital Cost**					
2.1	Drill 30-inch Diameter Borehole	100	L.F.	$200	$20,000	
2.2	Furnish and Install Conductor Casing	100	L.S.	$200	$20,000	
2.3	Drill 22-inch Nominal Exploratory Borehole	700	L.F.	$180	$126,000	
2.4	Borehole Geophysical Log	1	L.S.	$5,000	$5,000	
2.5	10-Inch Diameter Well Casing (HSLA)	250	L.F.	$100	$25,000	
2.6	10-inch Louvered Well Casing	600	L.F.	$150	$90,000	
2.7	Filter Pack	1	L.S.	$10,000	$10,000	
2.8	Sanitary Seal	1	L.S.	$7,500	$7,500	
2.9	Deviation Survey	1	L.S.	$2,500	$2,500	
2.10	Well Development	40	Hours	$350	$14,000	
2.11	Surface Completion	1	L.S.	$5,000	$5,000	
2.13	Install/Remove Test Pump	350	L.F.	$30	$10,500	
2.14	Test Pumping	250	Hrs	$220	$55,000	
2.15	Cutting Disposal	1	L.S.	$10,000	$10,000	
2.16	Well Site work	1	L.S.	$50,000	$50,000	
2.17	Well Exterior Piping	1	L.S.	$77,000	$77,000	
2.18	Well Vertical Turbine Pump	1	L.S.	$110,000	$110,000	
2.19	Well Mechanical	1	L.S.	$80,000	$80,000	
2.20	Well Disinfection	1	L.S.	$25,000	$25,000	
2.21	Well Electrical	1	L.S.	$175,000	$175,000	
2.22	Well Controls	1	L.S.	$35,000	$35,000	
2.23	Masonry Well Building	500	S.F.	$250	$125,000	
				Total Construction Cost of Well		**$ 1,153,000**

Appendix E

Water Storage Tank Matrix and Scoring Rationale

APPENDIX E - NON ECONOMIC EVALUATION - TERMINAL WATER STORAGE TANK

										TANK ALTERNATIVES			
Criteria			Subcriteria			Subcriteria Metric							
Criteria	Weight	Priority (%)	Subcriteria	Weight	Priority (%)	Metric	Weights	Priority (%)	Matrix Weight	APN 096-230-041 (Poulsen Property)		APN 096-290-056 (USFS Property)	
										Rank	Score	Rank	Score
O & M	5	15.4%	Accessibility	7.5	50.0 %	Length of Access Road	7.5	75%	5.8	1	2.9	2	5.8
						Type of Vehicle Access: Snow Cat, ATV, Light Truck, etc.	2.5	25%	1.9	2	1.9	2	1.9
						Sub-total	**10**	**100%**	**7.7**		**4.8**		**7.7**
			Impacts from Repair and Maintenance	5	33.3 %	Property Owner Impacts	5	100%	5.1	2	5.1	2	5.1
						Sub-total	**5**	**100%**	**5.1**		**5.1**		**5.1**
			Impacts from Natural Disaster	2.5	16.7 %	Avalanche	5	50%	1.3	1	0.6	2	1.3
						Landslides	5	50%	1.3	1	0.6	2	1.3
						Sub-total	**10**	**100%**	**2.6**		**1.3**		**2.6**
			Sub-total	**15**	**100.0 %**						**11.2**		**15.4**
Engineering	10	30.8%	Constructability	10	50.0 %	Standard v. Non-Standard Methods	10	27%	4.1	1	2.1	2	4.1
						Material Staging	5	13%	2.1	2	2.1	2	2.1
						Construction Vehicle Access	5	13%	2.1	2	2.1	2	2.1
						Slope	10	27%	4.1	1	2.1	2	4.1
						Rock Excavation	7.5	20%	3.1	1	1.5	2	3.1
						Sub-total	**37.5**	**100%**	**15.4**		**9.7**		**15.4**
			Accessibility	5	25.0 %	Length of Access Road	5	50%	3.8	1	1.9	2	3.8
						Existing/New Access Road	5	50%	3.8	2	3.8	1	1.9
						Sub-total	**10**	**100%**	**7.7**		**5.8**		**5.8**
			Connection to Existing System	5	25.0 %	Length of Pipeline	5	40%	3.1	2	3.1	1	1.5
						Difficulty of Construction	7.5	60%	4.6	2	4.6	2	4.6
						Sub-total	**12.5**	**100%**	**7.7**		**7.7**		**6.2**
			Sub-total	**20**	**100.0 %**						**23.2**		**27.3**
Public Impacts	5	15.4%	Potential for Opposition	10	57.1 %	Consideration to traffic, noise, air quality impacts	5	25%	2.2	2	2.2	2	2.2
						Proximity to residences	10	50%	4.4	2	4.4	2	4.4
						Potential impacts to private property	5	25%	2.2	2	2.2	1	1.1
						Sub-total	**20**	**100%**	**8.8**		**8.8**		**7.7**
			Aesthetic Impacts	7.5	42.9 %	Short term construction impacts (grading, staging areas)	5	33%	2.2	1	1.1	2	2.2
						Long term impacts (change in topography, removal of vegetation, visibility of tank)	10	67%	4.4	1	2.2	2	4.4
						Sub-total	**15**	**100%**	**6.6**		**3.3**		**6.6**
			Sub-total	**17.5**	**100.0 %**						**12.1**		**14.3**
Environmental	7.5	23.1%	Waters	2.5	9.1 %	Waters of US	10	44%	0.9	2	0.9	2	0.9
						Waters of State	10	44%	0.9	2	0.9	2	0.9
						Stream Crossings	2.5	11%	0.2	2	0.2	2	0.2
						Sub-total	**22.5**	**100%**	**2.1**		**2.1**		**2.1**
			Biological Resources	10	36.4 %	Listed Species	10	40%	3.4	2	3.4	2	3.4
						Critical Habitat	10	40%	3.4	2	3.4	2	3.4
						Species of Concern	2.5	10%	0.8	2	0.8	2	0.8
						Woodlands	2.5	10%	0.8	2	0.8	1	0.4
						Sub-total	**25**	**100%**	**8.4**		**8.4**		**8.0**
			Cultural Resources	7.5	27.3 %	Proximity to Water	2.5	11%	0.7	2	0.7	2	0.7
						Slopes	10	44%	2.8	2	2.8	2	2.8
						Known Resources	10	44%	2.8	2	2.8	2	2.8
						Sub-total	**22.5**	**100%**	**6.3**		**6.3**		**6.3**
			Land Use	7.5	27.3 %	USFS Lands	10	31%	1.9	2	1.9	1	1.0
						Private Property	7.5	23%	1.5	2	1.5	2	1.5
						Sensitive Receptors	7.5	23%	1.5	1	0.7	2	1.5
						Traffic	2.5	8%	0.5	2	0.5	2	0.5
						Air Quality/Green House Gases	5	15%	1.0	1	0.5	2	1.0
						Sub-total	**32.5**	**100%**	**6.3**		**5.1**		**5.3**
			Sub-total	**27.5**	**100.0 %**						**21.9**		**21.7**
ROW Requirements	5	15.4%	Permanent Easements	10	80.0 %	Probability of Obtaining an Easement	10	33%	4.1	2	4.1	2	4.1
						Cost of Obtaining an Easement	10	33%	4.1	1	2.1	2	4.1
						% within Existing ROW/PUE Easement	5	17%	2.1	1	1.0	2	2.1
						Public or Private easement	5	17%	2.1	1	1.0	2	2.1
						Sub-total	**30**	**100%**	**12.3**		**8.2**		**12.3**
			Temporary Construction Easements	2.5	20.0 %	Ability to secure temporary construction easements	2.5	100%	3.1	2	3.1	2	3.1
						Sub-total	**2.5**	**100%**	**3.1**		**3.1**		**3.1**
			Sub-total	**12.5**	**100.0 %**						**11.3**		**15.4**
Total	**32.5**	**100%**							**Total**		**79.7**		**94.1**

Weight = value assigned to given criterion (or subcriterion) with respect to other criteria (or subcriteria).

Priority = the value of weights after normalization.

Matrix Weight = the metric priority multiplied by the criterion priority.

APPENDIX E - TERMINAL WATER STORAGE TANK RATIONALE

Operations & Maintenance Subcriteria - Accessibility and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Length of Access Road (MW = 5.8)			
APN 096-230-041 (Poulsen Property)	Length = 1,100' (Access Easement in Ex. Dirt Rd from end of Winding Ck Rd)	1	2.9
APN 096-290-051 (USFS Property)	Length = 500' (Access Easement adjacent to 201 Sierra Crest Trail)	2	5.8
Type of Vehicle Access: Snow Cat, ATV, Light Truck, etc. (MW = 1.9)			
APN 096-230-041 (Poulsen Property)	Accessibility similar for both alternatives Well graded dirt roads Snow removal required in winter	2	1.9
APN 096-290-051 (USFS Property)	Accessibility similar for both alternatives Well graded dirt roads Snow removal required in winter	2	1.9

Operations & Maintenance Subcriteria - Impacts from Repair and Maintenance and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Property Owner Impacts (MW = 5.1)			
APN 096-230-041 (Poulsen Property)	Impacts similar for both alternatives. Typical repair and maintenance activity is re-coating Disturbances include noise and dust impacts Vehicle access through residential neighborhood will occur	2	5.1
APN 096-290-051 (USFS Property)	Impacts similar for both alternatives. Typical repair and maintenance activity is re-coating Disturbances include noise and dust impacts Vehicle access through residential neighborhood will occur	2	5.1

Operations & Maintenance Subcriteria - Impacts from Natural Disaster and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Avalanche (MW = 1.3)			
APN 096-230-041 (Poulsen Property)	Steep uphill slope Less slope vegetation South facing slope presents a lower probability of avalanche than a north facing	1	0.6
APN 096-290-051 (USFS Property)	Mild uphill slope More slope vegetation North facing slope presents a higher probability of avalanche than a south facing	2	1.3
Landslide (MW = 1.3)			
APN 096-230-041 (Poulsen Property)	Steep uphill slope Less slope vegetation	1	0.6
APN 096-290-051 (USFS Property)	Mild uphill slope More slope vegetation	2	1.3

Engineering Subcriteria - Constructability and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Standard v. Non-Standard Methods (MW = 4.1)			
APN 096-230-041 (Poulsen Property)	Due to steep slope, extensive hillside excavation required and site grading requirements (i.e. retaining walls, etc.) Potential need for special construction (i.e. partially buried concrete tank)	1	2.1
APN 096-290-051 (USFS Property)	Standard construction methods anticipated (i.e. at grade welded steel tank)	2	4.1
Material Staging (MW = 2.1)			
APN 096-230-041 (Poulsen Property)	Similar material staging requirements	2	2.1
APN 096-290-051 (USFS Property)	Similar material staging requirements	2	2.1
Construction Vehicle Access (MW = 2.1)			
APN 096-230-041 (Poulsen Property)	Similar construction vehicle access requirements	2	2.1
APN 096-290-051 (USFS Property)	Similar construction vehicle access requirements	2	2.1
Slope (MW = 4.1)			
APN 096-230-041 (Poulsen Property)	Due to steep slope, extensive hillside excavation required and site grading requirements	1	2.1
APN 096-290-051 (USFS Property)	Site slope more favorable to tank construction	2	4.1
Rock Excavation (MW = 3.1)			
APN 096-230-041 (Poulsen Property)	Geology expected to be similar at both sites Poulsen site will require more excavation due to	1	1.5
APN 096-290-051 (USFS Property)	Geology expected to be similar at both sites Less excavation is anticipated at this site	2	3.1

Engineering Subcriteria - Accessibility and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Length of Access Road (MW = 3.8)			
APN 096-230-041 (Poulsen Property)	Length = 1,100' Narrow existing road on steep side slope	1	1.9
APN 096-290-051 (USFS Property)	Length = 500'	2	3.8
Existing/New Access Road (MW = 3.8)			
APN 096-230-041 (Poulsen Property)	Existing access road	2	3.8
APN 096-290-051 (USFS Property)	New road required	1	1.9

Engineering Subcriteria - Connection to Existing System and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Length of Pipeline (MW = 3.1)			
APN 096-230-041 (Poulsen Property)	Approximately 400' down slope from tank to a connection point on Tiger Trail Rd. New easement will be required	2	3.1
APN 096-290-056 (USFS Property)	Approximately 1,600' based on running a parallel pipeline commencing at Sierra Crest Trail/Sierra Crest Ct through existing easements to a connection point near the intersection of Squaw Creek Rd and Squaw Valley Rd (adjacent to East Booster Pump	1	1.5
Difficulty of Construction (MW = 4.6)			
APN 096-230-041 (Poulsen Property)	New easement required 300' - 400' of construction on steep slope requiring cut-off walls More vegetation removal required Currently undisturbed alignment	2	4.6
APN 096-290-056 (USFS Property)	Existing easement 300' - 400' of construction on steep slope requiring cut-off walls Less vegetation removal required Existing disturbed alignment	2	4.6

Public Impacts Subcriteria - Potential for Opposition and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Consideration to traffic, noise, air quality impacts (MW = 2.2)			
APN 096-230-041 (Poulsen Property	Similar impacts for both alternatives	2	2.2
APN 096-290-051 (USFS Property)	Similar impacts for both alternatives	2	2.2
Proximity to residences (MW = 4.4)			
APN 096-230-041 (Poulsen Property	Similar impacts for both alternatives	2	4.4
APN 096-290-051 (USFS Property)	Similar impacts for both alternatives	2	4.4
Potential impacts to private property (MW = 2.2)			
APN 096-230-041 (Poulsen Property	Access on existing road	2	2.2
APN 096-290-051 (USFS Property)	New access easement required adjacent to existing residences	1	1.1

Public Impacts Subcriteria - Aesthetic Impacts and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Short term construction impacts (grading, staging areas) (MW = 2.2)			
APN 096-230-041 (Poulsen Property	More earthwork required	1	1.1
APN 096-290-051 (USFS Property)	Less earthwork required	2	2.2
Long term impacts (change in topography, removal of vegetation, visibility of tank) (MW = 4.4)			
APN 096-230-041 (Poulsen Property	Visible from multiple vantage points in Valley	1	2.2
APN 096-290-051 (USFS Property)	Vegetation provides minimal visual impact	2	4.4

Enviromental Subcriteria - Waters and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Waters of US (MW = 0.9)			
APN 096-230-041 (Poulsen Property	none	2	0.9
APN 096-290-051 (USFS Property)	none	2	0.9
Waters of State (MW = 0.9)			
APN 096-230-041 (Poulsen Property	none	2	0.9
APN 096-290-051 (USFS Property)	none	2	0.9
Stream Crossings (MW = 0.2)			
APN 096-230-041 (Poulsen Property	none	2	0.2
APN 096-290-051 (USFS Property)	none	2	0.2

Enviromental Subcriteria - Biological Resources and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Listed Species (MW = 3.4)			
APN 096-230-041 (Poulsen Property	1 state threatened	2	3.4
APN 096-290-051 (USFS Property)	1 state threatened	2	3.4
Critical Habitat (MW = 3.4)			
APN 096-230-041 (Poulsen Property	none present	2	3.4
APN 096-290-051 (USFS Property)	none present	2	3.4
Species of Concern (MW = 0.8)			
APN 096-230-041 (Poulsen Property	2 occurences	2	0.8
APN 096-290-051 (USFS Property)	2 occurences	2	0.8
Woodlands (MW = 0.8)			
APN 096-230-041 (Poulsen Property	less densely forested	2	0.8
APN 096-290-051 (USFS Property)	densely forested	1	0.4

Enviromental Subcriteria - Cultural Resources and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Proximity to Water (MW = 0.7)			
APN 096-230-041 (Poulsen Property	over 300 feet away on top of hill	2	0.7
APN 096-290-056 (USFS Property)	over 300 feet away on top of hill	2	0.7
Slopes (MW = 2.8)			
APN 096-230-041 (Poulsen Property	both sites on the top of the hillside	2	2.8
APN 096-290-056 (USFS Property)	both sites on the top of the hillside	2	2.8
Known Resources (MW = 2.8)			
APN 096-230-041 (Poulsen Property	no known previous surveys	2	2.8
APN 096-290-056 (USFS Property)	no known previous surveys	2	2.8

Enviromental Subcriteria - Land Use and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
USFS Lands (MW = 1.9)			
APN 096-230-041 (Poulsen Property	not on Federal lands	2	1.9
APN 096-290-056 (USFS Property)	requires USFS consultation	1	1.0
Private Property (MW = 1.5)			
APN 096-230-041 (Poulsen Property	Both alternatives have some component of private property impacts	2	1.5
APN 096-290-056 (USFS Property)	Both alternatives have some component of private property impacts	2	1.5
Sensitive Receptors (MW = 1.5)			
APN 096-230-041 (Poulsen Property	Poulsen property tank site much more visible	1	0.7
APN 096-290-056 (USFS Property)	USFS tank site closer to houses, maybe, but not really visible	2	1.5
Traffic (MW = 0.5)			
APN 096-230-041 (Poulsen Property	no traffic impacts	2	0.5
APN 096-290-056 (USFS Property)	no traffic impacts	2	0.5
Air Quality/Green House Gases (MW = 1.0)			
APN 096-230-041 (Poulsen Property	Longer construction for cut in slope tank on Poulsen	1	0.5
APN 096-290-056 (USFS Property)	similar construction times	2	1.0

ROW Requirements Subcriteria - Permanent Easements and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Probability of Obtaining an Easement (MW = 4.1)			
APN 096-230-041 (Poulsen Property	Requires negotiations with private parties	2	4.1
APN 096-290-051 (USFS Property)	Requires negotiations with private parties	2	4.1
Cost of Obtaining an Easement (MW = 4.1)			
APN 096-230-041 (Poulsen Property	More private land easement required	1	2.1
APN 096-290-051 (USFS Property)	Limited private land easement required	2	4.1
% within Existing ROW/PUE Easement (MW = 2.1)			
APN 096-230-041 (Poulsen Property	No existing ROW/PUE easement	1	1.0
APN 096-290-051 (USFS Property)	Portion of easements required are in existing ROW/PUE easements	2	2.1
Public or Private Easement (MW = 2.1)			
APN 096-230-041 (Poulsen Property	Tank and pipeline easement requires more private easement land area	1	1.0
APN 096-290-051 (USFS Property)	Tank easement within USFS ROW Connection to existing system in existing easement Limited private easement required for portion of access road	2	2.1

ROW Requirements Subcriteria - Temporary Construction Easements and Associated Metrics

Alternative	Scoring Rationale	Rank	Score
Ability to secure temporary construction easements (MW = 3.1)			
APN 096-230-041 (Poulsen Property	Similar requirements between alternatives	2	3.1
APN 096-290-051 (USFS Property)	Similar requirements between alternatives	2	3.1

Appendix F

Water Storage Tank Construction Cost Estimate

USFS Tank Planning Level Cost Estimate

Item No.	Description	Qty.	Unit	Unit Cost	Cost	
1.0	**Mobilization/Demobilization**					
1.1	Mobilization/Demobilization	1	L.S.	$54,250	$54,250	
2.0	**Capital Cost**					
2.1	Terminal Storage Tank Site Work + Grading	1	L.S.	$200,000	$200,000	
2.2	Terminal Storage Tank Site Piping	1	L.S.	$200,000	$200,000	
2.3	Terminal Storage Tank Erection	1	L.S.	$400,000	$400,000	
2.4	Terminal Storage Tank Interior Painting	1	L.S.	$75,000	$75,000	
2.5	Terminal Storage Tank Exterior Painting	1	L.S.	$25,000	$25,000	
2.6	Terminal Storage Tank Telemetry, Control and Install	1	L.S.	$50,000	$50,000	
2.7	Landscaping and Revegetation	1	L.S.	$35,000	$35,000	
2.8	Access Road	1,000	L.F.	$100	$100,000	
2.9	10-inch Connection to Existing System	2,300	L.F.	$175	$402,500	
	Total Construction Cost for the Terminal Tank					**$ 1,542,000**

Poulsen Tank Planning Level Cost Estimate

Item No.	Description	Qty.	Unit	Unit Cost	Cost	
1.0	**Mobilization/Demobilization**					
1.1	Mobilization/Demobilization	1	L.S.	$58,638	$58,638	
2.0	**Capital Cost**					
2.1	Terminal Storage Tank Site Work + Grading	1	L.S.	$300,000	$300,000	
2.2	Terminal Storage Tank Site Piping	1	L.S.	$200,000	$200,000	
2.3	Terminal Storage Tank Erection	1	L.S.	$400,000	$400,000	
2.4	Terminal Storage Tank Interior Painting	1	L.S.	$75,000	$75,000	
2.5	Terminal Storage Tank Exterior Painting	1	L.S.	$25,000	$25,000	
2.6	Terminal Storage Tank Telemetry, Control and Install	1	L.S.	$50,000	$50,000	
2.7	Landscaping and Revegetation	1	L.S.	$35,000	$35,000	
2.8	Access Road	1,350	L.F.	$65	$87,750	
2.9	10-inch Connection to Existing System	435	L.F.	$175	$76,125	
2.10	Retaining Walls	175	L.F.	$1,000	$175,000	
	Total Construction Cost for the Terminal Tank					**$ 1,483,000**

Appendix G

Booster Pump Station Construction Cost Estimate

Booster Pump Station Planning Level Cost Estimate

Item No.	Description	Qty.	Unit	Unit Cost	Cost	
	CONSTRUCTION COSTS FOR BOOSTER PUMP STATION					
1.0	**Mobilization/Demobilization**					
1.1	Mobilization/Demobilization	1	L.S.	$56,445	$56,445	
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	1	L.S.	$100,000	$100,000	
2.4	Vertical Turbine Suction Cans	1	L.S.	$35,000	$35,000	
2.5	Vertical Turbine Pumps	1	L.S.	$188,000	$188,000	
2.6	Pump Station Mechanical	1	L.S.	$185,000	$185,000	
2.7	Chlorination Equipment	1	L.S.	$20,000	$20,000	
2.8	HVAC Equipment	1	L.S.	$25,000	$25,000	
2.9	Pump Station Electrical Work	1	L.S.	$170,000	$170,000	
2.10	Primary Power Infrastructure	1	L.S.	$60,000	$60,000	
2.11	Pump Station Instrumentation and Controls Work	1	L.S.	$135,000	$135,000	
2.12	Fire Sprinker System	1	L.S.	$10,000	$10,000	
2.13	Disinfection and Testing	1	L.S.	$12,000	$12,000	
2.14	10-inch Tie-in to existing system	1	L.S.	$25,000	$25,000	
	Total Construction Cost for the Booster Pump Station					**$ 1,121,000**

FARR WEST
ENGINEERING

TECHNICAL MEMORANDUM

SQUAW VALLEY PUBLIC SERVICE DISTRICT

REDUNDANT WATER SUPPLY – PREFERRED ALTERNATIVE EVALUATION PROJECT PHASE 3 – PREFERRED ALTERNATIVE EVALUATION

Prepared For: Mike Geary, P.E., General Manager

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Reviewed By: M. Bernadette Bezy (Stantec)

Date: December 11, 2015

Subject: **Technical Memorandum No. 3 – Project Description**

1.0 PURPOSE

The purpose of this technical memorandum (TM) is to provide a project description that can be used for project planning, public outreach, and set a foundation for the specific project descriptions required for environmental documents and permits as part of the Squaw Valley Public Service District (District or SVPSD) Redundant Water Supply – Preferred Alternative Evaluation Project (Project). A strategic and well-written project description will help avoid or minimize costly compliance and mitigation requirements. The project description was written to be easily inserted into a CEQA, NEPA, or environmental permit application project description, as well as provide the District and the Board with a clear vision of the continued development of the project. The project description also aims to define the anticipated environmental permitting requirements, timelines, and costs, and identify the "next steps" for the project leading into permitting and design.

2.0 PROJECT OVERVIEW

The District is proposing a project to provide a safe and reliable redundant water supply for the Olympic Valley (the Valley) water customers. There are two water purveyors in the Valley, the District and the Squaw Valley Mutual Water Company (SVMWC). The redundant water supply demand is defined as being the quantity of water necessary to maintain indoor water use patterns for all water customers. The redundant water supply does not include irrigation for District

customers or snowmaking/irrigation demands met with supply from the Squaw Valley Resort or the Resort at Squaw Creek. The redundant water supply would only be used in the event of Stage 3 drought conditions, where appropriate water conservation measures would first be in place to eliminate outdoor watering and groundwater pumping for golf course irrigation and snowmaking.

The proposed Project involves a water supply from the Martis Valley Groundwater Basin (MVGB), a transmission pipeline approximately eight miles in length from the Town of Truckee to the Olympic Valley located in the Caltrans Highway 89 right-of-way right of way (ROW), a booster pump station located somewhere along the Highway 89 corridor, and an independently recommended terminal water storage tank located in the Olympic Valley.

The proposed Project would include an emergency water supply intertie agreement with the Truckee Donner Public Utilities District (TDPUD) and/or the Northstar Community Services District. The redundant water supply quantity was defined in the November 2015 Feasibility Study Update to be a maximum of approximately 650 gallons per minute (gpm), or approximately 371 acre-feet per year (AFY) under existing water demand conditions and 863 AFY under estimated buildout water demand conditions. This includes redundant water demands for the District and SVMWC. The available water resources in the MVGB were presented in the November 2015 Feasibility Study Update (TM #3 – Groundwater Availability in the Martis Valley). Based on the estimated available groundwater in the MVGB as compared to the estimated buildout water demands in the Martis Valley, there appears to be between 3,000 and 12,000 AFY of available water resource. The District's estimated buildout redundant water demand of 863 AFY would be a small portion of estimated water resource available in MVGB.

Under the preferred proposed Project conditions, water would be provided from TDPUD's 6,040 foot or 6,170 foot pressure zones and transported via a 10-12 inch pipeline along the east or west shoulder of the Caltrans Highway 89 ROW. The water supply would feed a new and independently recommended water storage tank located on APN 096-290-051, a parcel owned by the United States Forest Service (USFS), at an elevation of approximately 6,350 feet. A booster pump station located along the Highway 89 corridor would be required to move water from the TDPUD lower pressure zone to the District's higher pressure zone.

3.0 PROJECT HISTORY

For well over a decade, the Squaw Valley Public Service District (District) has dedicated an enormous amount of resources studying water supply options and the available water supply in and around the Olympic Valley. Some of these studies have included the Squaw Valley Groundwater Development and Utilization Feasibility Study, the aquifer storage and recovery investigation, and the water treatment plant preliminary design project, among others.

Moving forward with the evaluation of a redundant water supply, in September 2009, the District completed the Squaw Valley Public Service District - Alternative/Supplemental Water Supply and Enhanced Utilities Feasibility Study (Study). The purpose of the study was to determine potential project "fatal flaws" and it investigated the feasibility of importing water supplies from outside District boundaries as a redundant water supply for the Valley's current and future water supply customers. The Study concluded that the feasibility of the project was apparent based on the available water supply from the Martis Valley, desire of local water purveyors to work with the

District on the proposed project, potential transmission main corridors within the Highway 89 corridor and USFS ROW, no major environmental fatal flaws, and interest from natural gas and communications providers in the area partnering with the District to create a utility corridor to provide these services to the Valley and others along the alignment.

In November 2013, the District initiated the Redundant Water Supply – Preferred Alternative Evaluation Project. The primary purpose of this project was to evaluate the various water supply and transmission alternatives and identify a preferred water supply project for the District. To satisfy this purpose, the scope of work for the Redundant Water Supply – Preferred Alternative Evaluation project, the project approach included three distinct phases:

- Phase 1 – Water Supply Feasibility Summary and Gap Analysis.
- Phase 2 - Evaluation of Water Supply Source(s) Identified in Gap Analysis.
- Phase 3 – Preferred Alternative Evaluation.

The District recently completed Phase 1 – Water Supply Feasibility Summary and Gap Analysis (November 6, 2014) and Phase 2 – Evaluation of Water Supply Source(s) Identified in Gap Analysis (February 24, 2015). The Phase 3 Feasibility Study Update was completed in November 2015. Phase 3 will culminate with a Summary Memorandum, which includes the Evaluation Criteria and Alternatives Evaluation Approach TM (October 19, 2015), the Alternatives Evaluation TM (December 8, 2015), and this Project Description TM.

The approach for Phase 1 – Water Supply Feasibility Summary and Gap Analysis, was to review and summarize the water supply investigations that have been performed by the District in past evaluations of local water sources dating back more than 60 years. This memorandum summarized this work and presented the key findings as to which water supply alternatives were considered to be infeasible and why. During the Phase I investigation, gaps in evaluations on other potential local water sources were also identified. These gaps included the North and South forks of Squaw Creek, horizontal wells on the north and south flanks of the Valley, Squaw Creek surface water storage, wastewater recycling/reuse, and water supply from the Alpine Springs County Water District. These data gaps were further evaluated in Phase II of the project.

The Phase 2 –Evaluation of Water Supply Source(s) identified in the Gap Analysis, included a feasibility-level evaluation of any potential local areas of water supply identified in the Phase I analysis. This phase included a literature-level hydrogeologic feasibility evaluation of additional potential water sources in or near the Valley. The conclusions of this evaluation found that there were no in or near Valley water supply sources that satisfied the District's goals and objectives for a redundant water supply for the Valley.

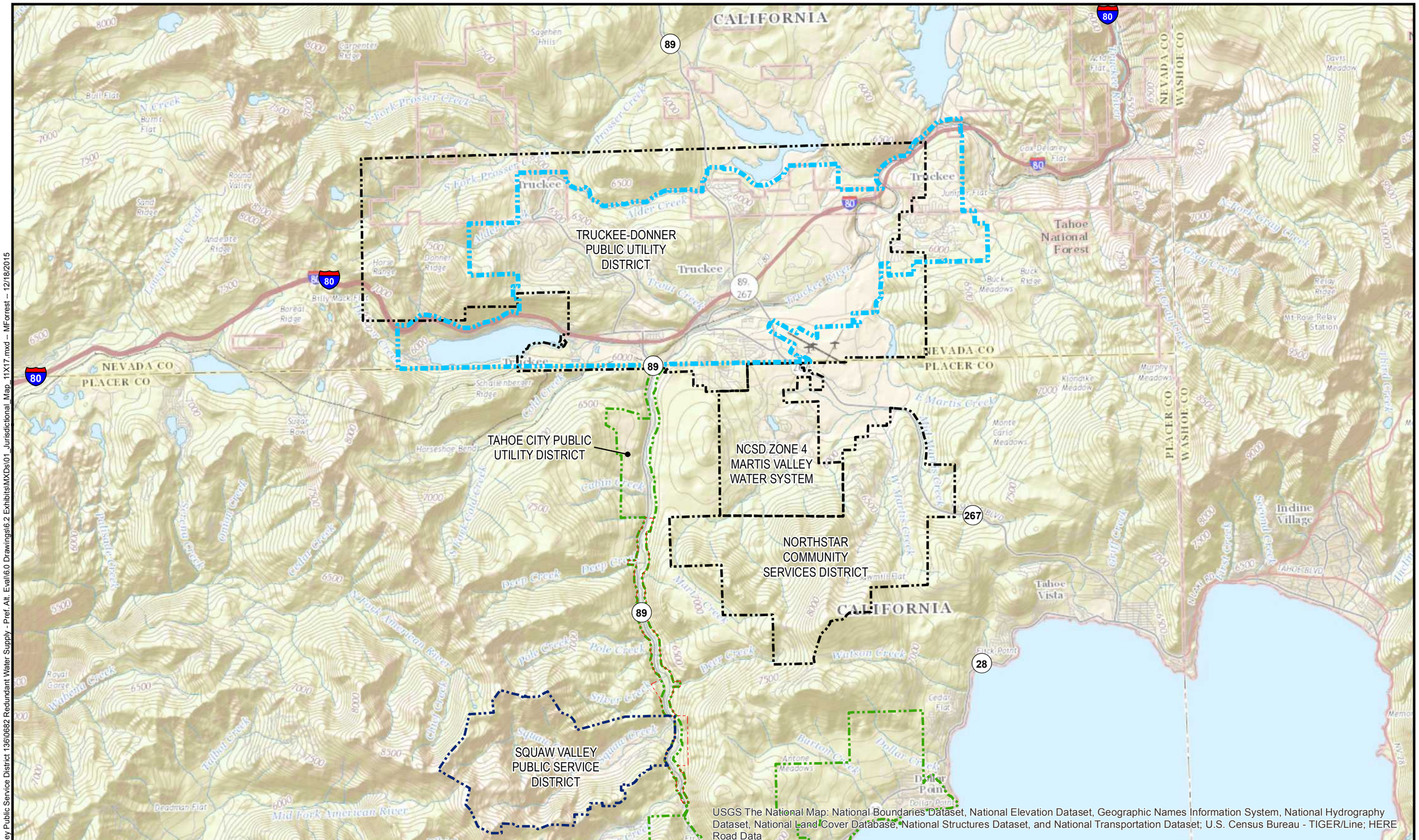
The Phase 3 –Preferred Alternative Evaluation assessed the feasible water supply options and developed a preferred proposed alternative and this Project Description. This phase included updating the 2009 Alternative/Supplemental Water Supply and Enhanced Utilities Feasibility Study, and performing a detailed ranking and evaluation of supply and transmission alternatives. In the end, a preferred water supply project and its associated components were identified and recommended.

The final task in Phase 3 included the development of this Project Description to support the District moving forward with the planning, design, and permitting of the Project.

4.0 LOCATION OF PROPOSED PROJECT

The preferred Project is located in Eastern Placer County along the Truckee River from the Town of Truckee to existing Squaw Valley Public Services District infrastructure at the intersection of Squaw Valley Road and Highway 89. From the intersection at Highway 89, Squaw Valley Road follows a westerly course through the Olympic Valley which makes up the majority of the District's service area. The Project is located in the Sierra Nevada Mountain Range at an elevation of approximately 6,000 feet above mean sea level (AMSL). Project components include a source of water, transmission pipeline, booster pump station and a new and independently required terminal water storage tank.

The alternatives evaluation identified the preferred water source to be an intertie agreement with TDPUD and/or NCSD for the redundant water supply. The preferred proposed transmission pipeline would be installed in the untraveled shoulder of Highway 89 in Caltrans ROW from the approximate intersection of Highway 89 and Deerfield Drive to Squaw Valley Road. The preferred proposed booster pump station would be installed along the transmission main alignment at a location adjacent to Caltrans ROW determined through a detailed hydraulic analysis and availability of easements/property to the District. The preferred proposed terminal water storage tank is an independent utility from the proposed project and would be constructed on the south slope of the Olympic Valley adjacent to Sierra Crest Trail in a previously undisturbed location at an elevation of 6,350 feet AMSL. Nearby roadways include Interstate 80 (to the north), State Routes 267 (to the east) and 28 (to the south). Figure 1 shows the jurisdictional boundaries of the water purveyors in the area and Figure 2 provides the potential proposed locations of the project components.



USGS The National Map: National Boundaries Dataset, National Elevation Dataset, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data

LEGEND

- Truckee Town Limit
- SVPSD (Fire Only)
- SVPSD (Utility/Fire)
- TCPUD Boundary
- Water Purveyor Boundary

0 2,000 4,000 8,000 Feet

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SQUAW VALLEY PUBLIC SERVICE DISTRICT

REDUNDANT WATER SUPPLY - PREFERRED ALTERNATIVE EVALUATION PROJECT
PHASE 3 - FEASIBILITY STUDY UPDATE

SHEET TITLE: JURISDICTIONAL MAP

FIGURE NUMBER: 1

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NORTHSTAR COMMUNITY SERVICES DISTRICT

NCSD ZONE 4 MARTIS VALLEY WATER SYSTEM

SCHAFFER MILL RD

267

267

TRUCKEE-DONNER PUBLIC UTILITY DISTRICT

W RIVER ST

Potential Proposed Tie-In 6,170 Zone

89

HIGHWAY 89

TAHOE CITY PUBLIC UTILITY DISTRICT

INTERSTATE 80

Potential Proposed Transmission Pipeline

Potential Proposed Tie-In To SVPSD System

Potential Proposed Water Storage Tank

Potential Proposed Booster Pump Station

SQUAW VALLEY RD

SQUAW VALLEY PUBLIC SERVICE DISTRICT

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- Truckee Town Limit
- SVPSD (Fire Only)
- SVPSD (Utility/Fire)
- TCPUD Boundary
- Water Purveyor Boundary
- Storage Reservoir
- Potential Proposed Booster Pump Station
- Potential Proposed TDPUD Tie-In
- Highway 89 Alignment (East & West Shoulder)

0 2,000 4,000 Feet

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SQUAW VALLEY PUBLIC SERVICE DISTRICT

REDUNDANT WATER SUPPLY - PREFERRED ALTERNATIVE EVALUATION PROJECT
PHASE 3 - ALTERNATIVES EVALUATION

SHEET TITLE: PROJECT COMPONENTS

FIGURE NUMBER: 2

P:\Client Projects\Squaw Valley Public Service District 1361\0682 Redundant Water Supply - Pref. Alt. Eval\6.0 Drawings\6.2 Exhibits\MXDs\02_Project_Components_11X17.mxd -- MForrest -- 12/18/2015

5.0 PROJECT NEED AND OBJECTIVES

5.1 PROJECT NEED

The District is tasked with ensuring a long-term reliable water supply as identified in the District's Strategic Plan. The need for a redundant water supply has long been established as a primary goal in the District's Strategic Plan. That goal included developing a feasibility study of water supply options that address available water supplies from within the Olympic Valley watershed, as well as potentially available water supplies that can be imported from outside the watershed.

As the primary groundwater management agency in the Basin, the District has led the development of the Groundwater Management Plan in cooperation with stakeholders representing local groundwater users, environmental organizations, regulatory agencies, and the public. The July 22, 2015 Village at Squaw Valley Specific Plan Water Supply Assessment 2015 Update (WSA) concluded that there is sufficient supply to support an increase in water demands through 2040 as planned for in County and local planning documents. This WSA and groundwater management planning studies have supported the need for a redundant supply to bolster the District's emergency preparedness. The redundant water supply will provide the necessary reliability and flexibility to the water system in case of emergency, drought, groundwater contamination, well failure, or other emergency situations.

OLYMPIC VALLEY EXISTING WATER SUPPLY

The District is a Special District organized under Water Code Division 12 and incorporated in the State of California in 1964. The District provides water, wastewater, garbage collection, fire protection, and emergency medical services to Squaw Valley and is governed by a five-member Board of Directors. The District currently serves more than 1,500 connections and 20 large commercial entities (SVPSD 2014) from four active wells in the Basin, two horizontal bedrock wells, and a distribution network that runs through most of Olympic Valley.

The District's wells currently operate off of two groundwater sources: groundwater from the alluvial Olympic Valley Groundwater Basin (Basin) and groundwater from horizontal fractured bedrock wells in the mountainous areas above the Olympic Valley floor. Groundwater produced from the Department of Water Resources designated Basin alluvial aquifer has been the primary source of water supply in the area since the development of Olympic Valley.

Currently, there are three other major water suppliers in the Olympic Valley, all of whom currently pump groundwater from the Basin. Current and previous studies have found the Basin to have adequate supply for planned growth within Olympic Valley. Municipal water supply in Olympic Valley is currently produced primarily from the western portion of the Basin, where SVPSD's four active wells are located and the Squaw Valley Municipal Water Company (SVMWC) has two active wells. Studies have found the western portion of the Basin is the most productive and provides water quality meeting state and federal requirements. A small quantity of the water supply used in Olympic Valley is produced from horizontal wells located in fractured bedrock. There are three total horizontal bedrock wells, two operated by the District and one operated by the SVMWC. These wells are located on the hillsides above the Basin. Studies have shown that groundwater is present in the fractured crystalline rocks surrounding the Basin and recent studies by Lawrence

Livermore National Laboratories have shown that there is not a strong connection between the Basin and the fractured bedrock groundwater system.

5.2 PROJECT GOALS AND OBJECTIVES

The overall project goals are:

- Provide a redundant source of water supply for Olympic Valley to allow for reliable quantity and quality that is geographically diverse from the aquifer currently used as the primary source of potable water, and to provide redundancy for improved emergency preparedness; and
- Identify a reliable redundant water supply of sufficient quantity and adequate quality to serve the existing and future water supply needs based on projected indoor water demands associated with Squaw Valley General Plan and Land Use Ordinance;

Specific objectives of the project include:

- Provide reliable redundant water supply for the Olympic Valley;
- Minimize environmental impacts;
- Strategically provide redundant source supply in the most cost effective and streamlined approach;
- Diversify the District's water reliance on groundwater in Olympic Valley during times of drought and/or aquifer contamination;
- Maintain water supply utility to District customers in the event of an emergency;
- Provide a water supply that meets regulatory requirements;
- Minimize project operation and maintenance (O&M) costs;
- Avoid, reduce, or mitigate significant effects on the environment;
- Accommodate feasible project funding opportunities;
- Minimize impacts to the public that could be caused by project construction and operation, and
- Optimize overall project design costs and construction costs.

6.0 PROJECT COMPONENTS

The preferred proposed Project components include a source of water, transmission pipeline, booster pump station and a new independently recommended terminal water storage tank. The preferred, proposed source of water would come from existing TDPUD or NCSD underground wells and would be conveyed through existing infrastructure to the point of connection of the transmission main. The point of connection for the transmission main would be near the intersection of Deerfield Drive and Highway 89 within the TDPUD's 6,170 foot pressure zone. The transmission main would be a 10 inch to 12 inch diameter pipe (final diameter to be determined thorough hydraulic analysis) installed underground in the previously disturbed shoulder of Highway 89 for a length of approximately eight miles. Along this preferred proposed alignment the District would acquire a small parcel of land (approximately 3,000-5,000 square feet) adjacent to the Caltrans ROW to construct a booster pump station. The final proposed and independently recommended component is a 1,000,000 gallon water storage tank, which would be located on APN 096-290-051, currently owned by the United States Forest Service (USFS). The

proposed storage tank is an independent utility from the proposed project and therefore due to need, may be permitted and constructed separately from the preferred proposed project. Both the proposed booster pump station and the proposed terminal storage tank would also require access roads and underground piping to connect the facilities to the transmission main or the existing distribution system, respectively.

6.1 PREFERRED PROPOSED TRANSMISSION MAIN

The proposed transmission main pipeline would be a 10 inch to 12 inch diameter pipe installed underground from the intersection of Deerfield Drive and Highway 89 to Squaw Valley Road, approximately 42,000 linear feet (lf). At this point in the Project, the preferred proposed pipeline corridor encompasses the Caltrans ROW between Truckee and the Olympic Valley. It is preferred to install the pipeline in the unpaved shoulder or slope inside the Caltrans ROW (varies in width) between Truckee and the Olympic Valley. Where the unpaved shoulder is too narrow the proposed pipeline would be installed within the eight foot wide paved shoulder and bike path. The width of the excavated trench would be approximately three feet in width by five feet deep. In areas where the trench transects existing asphalt pavement, the asphalt section would likely be cut back for an approximate width of five feet.

The proposed pipeline would have isolation valves installed approximately every 1,000 feet and would potentially cross under approximately 64 drainage culvert or creek crossings. Crossings where the existing culvert is 48 inches or smaller in diameter would likely be open excavated with fully restrained ductile iron pipe installed with an approximate minimum of 18 inches of separation between the top of pipeline and the bottom of the storm drain pipe. For potentially proposed crossings where the culvert is larger than 48 inches, a jack and bored or horizontal directional drill construction method could be used to install the pipeline under the existing storm drain or creek crossing culvert. Blow off valves and/or air release valves (ARV) would also be required at every creek and storm drain crossing. At high points along the preferred proposed alignment an ARV assembly would be installed. ARV assemblies typically include a screened riser vent which extends 18 inches above finished grade. The preferred proposed project includes fire hydrants to be installed approximately every 1,000 feet along the alignment. Fire hydrants, ARV's, and any other above ground structure would need to be installed a minimum of 20 feet horizontally from the Highway 89 travel lane. The preferred proposed Project pipeline construction activities are anticipated to be limited to an approximate 20 foot wide corridor along the length of the alignment.

The preferred proposed Highway 89 alignment corridor currently includes the east and the west shoulder as potential locations for pipeline installation. A geotechnical investigation and land survey will need to be completed for a final determination to be made. Both items are anticipated to be completed in the Preliminary Design phase. The surrounding land uses along the proposed corridor include Timberland, Low Density Residential, and Highway 89 ROW.

For the preferred proposed pipeline corridor, the District would be required to apply for an encroachment permit with Caltrans and would be assigned a Caltrans project coordinator since estimated costs are above $3,000,000. This special project development designation would last up to one year and would set special terms for hours of construction, traffic control, construction methods, construction materials and tree removal. After construction, the District would enter into

a long term maintenance agreement with Caltrans which would set the terms for long term maintenance and repair activities.

6.2 PREFERRED PROPOSED WATER SOURCE

In order to meet the goals and objectives of the proposed Project, a redundant water source capable of providing up to 650 gallons per minute (gpm) would need to be secured by the District. With the significant number of underground sources that exist in the MVGB, the preference is to negotiate a water supply intertie agreement with TDPUD and/or NCSD and wheel water through these systems to the start of the preferred proposed transmission pipeline. Obtaining excess capacity from a regional utility allows the District to avoid an exploratory drilling program, the construction of a new underground well, and construction of a new well house amongst other permitting and engineering hurdles that the drilling of a new source presents. Financial terms and operating agreements would be negotiated between the District and TDPUD and/or NCSD and would allow for a redundant water supply to be provided with a reduction in capital costs and environmental impacts.

6.3 PREFERRED PROPOSED WATER STORAGE TANK

The proposed water storage tank would likely be a welded steel water storage tank with a capacity of 1,000,000 gallons. The proposed tank may or may not be associated with the Project and may be constructed sooner as it has been identified as a capital improvement by the District in the water master plan. The proposed water storage tank would act not only as a terminal storage facility for the Project, but also create a new pressure zone in the District's water system to satisfy existing operational deficiencies. However, should the two projects occur simultaneously, a description of the preferred propose tank location and recommended specifications are included here in. The preferred proposed tank location is APN 096-290-051, a 54 acre parcel owned by the USFS.

The proposed storage tank would likely require an approximately 10,000 square foot pad and will be graded into an existing slope of 25 percent with an approximately 15 foot wide by 1,000 foot long road serving as access. The tank would be well screened by existing evergreens and shielded, due to its orientation, from most vantage points across the Valley. The proposed tank would be painted to match the hillside or in another aesthetically sensitive manner per District recommendations. The proposed tank would have an access ladder and a small amount of visible piping above ground. The tank would likely be installed at approximately 6,350 feet AMSL and would connect to the District's existing water distribution system via a 10 to 12 inch distribution main, approximately 2,300 feet away near the intersection of Squaw Creek Road and Meadow Court. For authorizations to install the proposed storage tank, the District will need to coordinate with the USFS to acquire easements for all underground piping, tank structures, access roads and disturbed areas associated with the water storage tank and to facilitate compliance with the National Environmental Policy Act (NEPA). The District would also be required to secure an easement adjacent to Sierra Crest Court for the access road and waterline. This would likely be on parcel APN 096-590-004; a parcel owned by the Homesites at Squaw Creek Partnership.

6.4 PREFERRED PROPOSED BOOSTER PUMP STATION

With a connection to TDPUD's existing 6,170 foot pressure zone, a proposed booster pump station may be located anywhere along the transmission main alignment between Deerfield Drive and Squaw Valley Road. The proposed booster pump station would likely be equipped with a minimum of two 75 horsepower pumps, a flow meter, disinfection equipment and other appurtenances inside of an approximately 20 by 20 foot structure. To install a proposed booster station, the District would need to acquire a parcel of land to construct the booster pump facility and access road in a location adjacent to the proposed transmission main pipeline. Depending on the location of the booster pump station, architectural and landscaping considerations may vary.

6.5 STAGING AREAS

The contractor is typically responsible for selecting staging areas for equipment staging areas and verifying environmental compliance prior to and during construction. The District can develop some staging area options and should include them in the proposed Project environmental impact disclosure documents; however, these areas are not specified at this point.

7.0 PROPOSED METHODS, SCHEDULE, AND DURATION OF CONSTRUCTION

As described above, the preferred proposed Project components include a source of water, transmission pipeline, booster pump station and an independently recommended terminal water storage tank. The proposed source of water would be from existing TDPUD or NCSD underground wells and would likely be conveyed through existing infrastructure to the point of connection of the preferred proposed pipeline transmission main corridor. It is anticipated that negotiations between the District and these regional utilities would take approximately 6 to 12 months to develop a potential intertie water service agreement. This proposed negotiation component is not anticipated to require any construction activities; however, the remaining components of the preferred proposed Project would need to be built prior to the new water source being brought online.

The proposed transmission pipeline would be an approximately 10 to 12 inch ductile iron pipe (or other suitable material) installed via open trench construction for an approximate length of 42,000 lf. Construction activities would include clearing and grubbing, asphalt removal, excavation, installation, backfill, and surface restoration in the form of asphalt concrete, compacted aggregate base or seed mix. Caltrans would require full time traffic control and night work only unless the contractor elects to install k-rail barricades along the paved shoulder in which case they likely could work at any time of the day without restriction. With a 24 week construction season between May and October and an average installation rate of approximately 175 lf of pipe installed per day, the transmission pipeline would likely take two consecutive full construction seasons to construct.

The proposed booster pump station would likely include the construction of a small weatherproof structure and the installation of pumps and appurtenances. The construction would require minor grading around the structure and the construction of a paved access road at a location adjacent to the Caltrans ROW. Construction would likely be limited to approximately 3 months.

The proposed and independently recommended 1,000,000 gallon water storage tank would likely be built into an existing undisturbed slope and would require site grading, underground piping,

foundation preparation, welding, coating, and revegetation of disturbed areas. An unpaved access road and underground pipeline would also need to be constructed to place the tank into service. Proposed construction activities would take approximately 6 months to complete. The water storage tank will need to be constructed prior to the conveyance of water through the pipeline to be achieved.

Table 1 – Project Overview and Proposed Schedule

Project Component	Specific Activities	Location	Area of Impact	Estimated Schedule
Water Source	• N/A	Existing TDPUD or NCSD well	Martis Valley	6 – 12 Months
Pipeline	• Clearing & Grubbing • Asphalt cutting • Excavation • Pipe Installation • Jack and Bore Construction • Trench Backfill • Asphalt Concrete • Re-vegetation	West or East shoulder of Highway 89	Existing Caltrans ROW	12 Months (over 2 construction seasons)
Booster Pump Station	• Clearing & Grubbing • Concrete Foundation • Above and Underground Piping • Wood Framing • Asphalt Concrete • Electrical • Mechanical • SCADA	Adjacent to Caltrans ROW	Existing Caltrans ROW	3 Months
Water Storage Tank (or independently constructed prior to the project)	• Clearing & Grubbing • Foundation • Above and Underground Piping • Welding • Coating • SCADA	APN 096-290-051	Olympic Valley	6 Months

8.0 OPERATION AND MAINTENANCE ACTIVITY

There are two operations and maintenance scenarios for the proposed Project. First, the valves connecting the proposed pipeline to TDPUD's system and the District's system could be closed and only opened when the District's primary aquifer is impacted by drought conditions or becomes contaminated. This operational scenario would require the line to be filled with approximately 250,000 gallons of water prior to being disinfected and finally flushed to ensure that bacteriological growth doesn't enter the potable drinking water supply. This scenario would also not provide fire protection or drinking water to properties along the Truckee River corridor. If the District were to operate in this fashion the maintenance and operational requirements of the Project would be

negligible until the pipeline was charged with water. After the pipeline was put in use the District would need to read flow meters, check status of pumps, and check chlorine levels on a daily basis.

The second operational scenario would be to maintain a steady flow of water between the TDPUD and District systems to keep the system from bacteriological contamination. In this scenario the District would be responsible for daily master meter readings, daily booster pump station visits, bi-monthly inspections of all blow off appurtenances, an annual valve exercising and system flushing program, and monthly meter reading for all customers served by the pipeline along the Truckee River corridor, including those within the Tahoe City Public Utility District service area. This scenario would allow for a reliable potable drinking water source and fire protection along the Truckee River and Highway 89 corridor.

All system repairs would be performed by the District or by a general contractor hired by the District. Caltrans will require the District to enter into a long term maintenance agreement which will provide the District access to their asset and will define the requirements of all repair activities. This would include, but not be limited to, traffic control, asphalt replacement, revegetation, materials staging, and hours of work.

9.0 PROJECT ALTERNATIVES

9.1 INTRODUCTION

In determining what alternatives should be considered, it is important to acknowledge the objectives of the project, the potential for environmental effects, and any unique project considerations. These factors are crucial to the development and consideration of feasible alternatives.

This section has been prepared to discuss alternatives and water supplies evaluated and considered while developing the preferred project.

9.2 ALTERNATIVES IDENTIFICATION AND SELECTION

The intent of this section is to identify the potential alternatives that have been evaluated through project feasibility studies. This section utilizes the California Environmental Quality Act (CEQA) screening process and rationale as a basis to establish the reasonableness based on feasibility and ability to meet the project needs and objectives, which is used to select the range of alternatives that may be discussed in a future CEQA document. Accordingly, CEQA Guidelines section 15126.6(c) suggests the reasonable range of feasible alternatives in an environmental document include those that could feasibly accomplish most of the basic objectives of the project, and could avoid or substantially lessen one or more of the potentially significant effects. This range of alternatives is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to make a reasoned choice.

Methodology and Screening Criteria

As discussed in the Project History section, the redundant water supply options have been undergoing scoping, evaluations, and studies since 2009. During this initial project formulation and screening process, a range of alternatives were developed and considered. Early suitability analyses were conducted by the District and their consultants to identify a feasible redundant water supply source, a preliminary booster pump station location, practicable methods for conveying the redundant raw water supply to the District, and an independently recommended feasible tank site within District boundaries. These preliminary studies are accessible on the District's webpage (http://www.svpsd.org/documents).

The planning and suitability studies subjected the range of alternatives to the following criteria throughout the preliminary screening process:

- Is the alternative potentially feasible?
- Does the alternative meet the basic project objectives?
- Would the alternative avoid or lessen any significant impacts?

The purpose of the preliminary evaluations and studies conducted by the District was to develop and screen a range of feasible alternatives, and discuss them in a manner designed to foster meaningful public participation and informed decision-making through the eventual CEQA process. The many factors taken into consideration when developing the proposed project and the feasible alternatives included: availability of water supply; site suitability; economic viability; availability of infrastructure; General Plan consistency; other plans or regulatory limitations; jurisdictional boundaries; preliminary assessment of potential for environmental impacts, and whether reasonable easements or land acquisition could be obtained. The District took these factors into consideration and identified the alternatives discussed in the following sections as potential alternatives for the proposed project.

Types of Alternatives

For the purpose of analysis, two types of alternatives were considered and subjected to the screening criteria. The first category, alternatives to the proposed project, considered other potential projects that could feasibly accomplish the same objectives as the proposed project by bringing a redundant water supply into the District from alternate locations. The second category, alternatives within the proposed project, include feasible alternate corridor routes, tank sites, and water supply sources. Alternatives were then determined infeasible due to engineering reasons, regulatory requirements, lack of available water supply, or carried through for further analysis. Descriptions of each potential alternative are included below. An evaluation of the potential alternatives compared to the proposed project could be required in a future NEPA or CEQA environmental impact assessment public disclosure document.

Alternatives originally considered, but dismissed as infeasible as identified in the Phase 1 – Water Supply Feasibility Summary and Gap Analysis (November 6, 2014), Phase 2 – Evaluation of

Water Supply Source(s) Identified in Gap Analysis (February 24, 2015) and Phase 3 Feasibility Study Update (November 10, 2015) include:

- Water Source from Olympic Valley East and West Aquifers;
- Water Source from the North and South Forks of Squaw Creek;
- Water Source from the North and South Flanks of Olympic Valley ;
- Water Source from Squaw Creek Surface Water Storage;
- Water Source from Recycled Wastewater;
- Water Supply from the Alpine Springs County Water District (ASCWD);
- Aquifer Storage and Recovery Study;
- Water Treatment Plant Siting and Process Evaluation;
- Water Source from Cinder Cone Springs;
- Truckee River Side Drainages (Highway 89 corridor), and
- Water Source from Truckee River (TROA).

Alternatives originally considered, but dismissed as infeasible based on the preliminary alternatives evaluation in the Phase 3 - Evaluation Criteria and Alternatives Evaluation Approach TM include:

- USFS 06 Road Alignment Corridor
- Liberty Energy Powerline Alignment Corridor

Alternatives considered potentially feasible and assessed for further consideration based on the Phase 3 Feasibility Study Update and Evaluation Criteria and Alternatives Evaluation Approach TM include:

- Transmission Alignment Alternatives TTSA TRI Alignment and Placer County Bike Trail Alignment;
- New Water Source Areas A, B, C, D, and Zone 4;
- Terminal Water Storage Tank at APN 096-230-041 (Poulsen Property), and
- Booster pump station connected to the TDPUD 6,040 foot Pressure Zone.

These alternatives were developed through consideration of extensive scoping, previous reports, and technical studies conducted for the proposed project. Project documents are available on the District's website: http://www.svpsd.org/documents and would be further identified in the environmental documentation process. These alternatives will be subject to the CEQA criteria requiring analysis to determine if they meet the project objectives, are potentially feasible, and could reduce one or more of the proposed project's impacts.

10.0 REGULATORY COMPLIANCE

The purpose of this regulatory compliance section is to provide information for future environmental documents and to present the currently envisioned potential regulatory schedule.

10.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT COMPLIANCE

The proposed project will be a discretionary action conducted by a public agency and, therefore, will be required to comply with the California Environmental Quality Act (CEQA). According to Article 4, Section 15050 to 15053 of the CEQA Guidelines, a single Lead Agency shall be responsible for preparing the CEQA document. SVPSD would own and operate all project components, and would be the Lead Agency under CEQA. Regardless of proposed project alternative, CEQA compliance is required. Details regarding the CEQA public disclosure and review processes should also be included in the introduction to the CEQA document.

10.2 NATIONAL ENVIRONMENTAL POLICY ACT

If the preferred proposed Project is federally funded, crosses federal jurisdictions or requires a permit approval from a federal agency, the federal agencies will need to comply with the NEPA**.** Because the project would likely entail federal approvals from federal environmental regulatory agencies such as the USFS (for the proposed Tank site) and United States Army Corps of Engineers (USACE) (for jurisdictional waters crossings) there would be a "federal nexus" and compliance with the NEPA would be necessary. The preferred tank site would require a USFS Special Use Permit and the USFS would be the federal lead agency for NEPA assessment of the tank site.

However, USACE drainages along Highway 89 would likely fall under a Nationwide 12 permit (NWP) for linear infrastructure, where USACE would have already completed a NEPA assessment.

If the proposed Project receives federal funding, that agency would likely be the NEPA Lead Agency. The NEPA compliance process will be sorted out further based on proposed funding and construction details.

10.3 ENVIRONMENTAL PERMITTING

In order to reduce potential environmental impacts and minimize/streamline potential permitting processes, the District evaluated environmental constraints in the 2009 and 2015 feasibility evaluations and scientists and engineers worked together to prepare the 2015 alternatives evaluation which ranked and selected alternatives based on current environmental and engineering considerations. Design and avoidance measures would be incorporated to further minimize potential environmental impacts. In addition to CEQA and NEPA, the likely key environmental permits for the proposed Project are defined in **Table 2**. Each of these regulations would also be described in detail in the respective resource sections in the proposed Project CEQA and NEPA documents.

Table 2 – Permit Timelines

Permit Name	Agency	Trigger	Estimated Timeline*
CEQA Compliance	SVPSD (Lead Agency)	Discretionary Action by the District	12-18 months
NEPA Compliance	USFS	Special Use Permit from USFS	12-16 months
CWA 401 Certification (and Board - Resolution No. 6-93-08)	RWQCB Lahontan	Surface Waters of the US (Lahontan RWQCB)	4-5 months
Wetland Delineation Verification	RWQCB Lahontan	Waters of U.S. (ordinary high water mark) and wetlands	6-8 months
CWA 404 Permit	USACE	Waters of US wetlands/vernal pools (ordinary high water mark)	12-18 months
USFWS ESA Section 7 Consultations	USFWS	Potential for "take" of Federally listed habitat or Individuals	9-12 months (assuming formal consultations)
SHPO NHPA Section 106 Consultations	SHPO	Cultural Resources	2-3 months
Fish and Game Code 1602 Permits	CDFW	Impacts to Bed/Bank and floodplain	4-5 months
Placer County Tree Permit**	Placer County	Removal of trees 6-inch dbh or greater	1-2 months
Encroachment Permits (Caltrans and local agency**)	Caltrans	Placement of pipeline within Caltrans or County Easements	2-6 months
Grading Permit** and Stormwater Pollution Prevention Plan (SWPPP)	SWRCB	County grading permit and State SWPPP for grading areas > 1-acre	2-6 months

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

** Special District Water Utilities may be exempt.

11.0 PROJECT NEXT STEPS

This section presents a summary of actions to be undertaken by the District to move forward with Preliminary Design and Environmental Permitting of the proposed Project.

The initial next step for the proposed Project is to begin a dialogue with the TDPUD and NCSD regarding the water supply. The preferred water source for the proposed Project would be an intertie agreement(s) with the TDPUD and/or NCSD. In general, the intertie agreement(s) would define the available water quantity, method of delivery, and timing of deliveries. It is likely that various water supply studies will need to be performed for the TDPUD and NCSD systems to define these terms. The ability of these systems to supply a short term or long term redundant water supply to the District must be understood before subsequent tasks of the Project can move forward.

If an intertie agreement with these agencies for water supply cannot be executed, then the District would have to pursue a new water source as identified in the Phase 3 TM #2 – Alternatives Evaluation. The preferred new water source alternative was identified as a well located in the vicinity of Highway 267 and Schaffer Mill Road near the Truckee Airport. If the District were to drill a new well, an intertie agreement with the TDPUD and/or NCSD would be necessary to wheel water through these systems to the proposed preferred transmission main beginning point in the vicinity of Deerfield Drive and Highway 89.

Following completion of the potential intertie agreement(s) with TDPUD and/or NCSD, the Project can move forward with Preliminary Design and Environmental Permitting. Preliminary Design activities will bring the Project forward to the 30 percent design level to support the Environmental Permitting documents. Table 3 below provides a list of tasks associated with the Preliminary Design and Environmental Permitting activities. The timing and costs of these activities will be scoped out in more detail as Project financing becomes available.

The terminal water storage tank is identified as an independent utility in this Project Description for the purpose of flexibility in environmental permitting. The water storage tank has been identified by the District as a potentially necessary asset to address operational issues in the existing water system by creating a new pressure zone in the eastern end of the Valley. Therefore, the water storage tank may be constructed prior to the Project and could be designed and permitted outside of the Project.

There are other ancillary tasks that would also be investigated prior to or in parallel with the Preliminary Design and Environmental Permitting activities. This includes working with potential utility corridor teaming partners (Southwest Gas, Suddenlink Communications, etc.), as well as identifying other potential water users in the Highway 89 corridor (private residences, USFS campgrounds, ASCWD, TCPUD water service area, etc.).

Table 3 – Preliminary Design and Environmental Permitting Activities

Preliminary Design Activities	
Transmission Main	**Booster Pump Station**
• Field survey of the Highway 89 corridor • Geotechnical investigation • Preliminary alignment layout	• Hydraulic evaluation of TDPUD system • Hydraulic evaluation of transmission main between Truckee and Squaw Valley • Establish required elevation of booster pump station • Evaluate available land • Negotiate easement(s) with landowners • Survey and geotechnical investigation of selected site • 30% level design of site, building, and piping
Terminal Water Storage Tank	**New Water Source (if required)**
• Negotiate access road easement • Survey and geotechnical investigation • 30% level design of site, tank, access road, and piping	• Hydrogeologic investigation of preferred well site(s) • Negotiate easements with land owners • Exploratory drilling program and permitting
Environmental Permitting Activities	
• CEQA Documentation (Lead Agency to determine appropriate level of CEQA analysis through an Initial Study) • NEPA Documentation (water storage tank)(District to work with potential federal NEPA Lead Agencies to define NEPA Lead Agency and appropriate NEPA process) • Initiate the permit processes presented in Table 2 above	• Cultural resource records search through the California Historic Resources Information System (CHRIS) North Central Information Center (NCIC) • Cultural resource records search at the USFS (only applicable where Project components are located on USFS land) • AB52 and National Historic Preservation Act (NHPA) Section 106 compliant Native American Consultations • Obtain USFS Special Use Permit to complete cultural resource survey on any USFS land • Cultural Resource Survey