

Flume Replacement Alignment Study Workshop No. 1 Alternatives Development Phase

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Vista Irrigation District
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List of Abbreviations

BC	Brown and Caldwell
CEQA	California Environmental Quality Act
CIP	Capital Improvement Plan
DDW	Division of Drinking Water; CA Water Board
DFW	Department of Fish and Wildlife
District	Vista Irrigation District
ENR	Engineering News Record
EWTP	Escondido-Vista Water Treatment Plant
Flume	Vista Flume
GIS	geographical information system
lf	linear feet
NEPA	National Environmental Policy Act
O&M	Operations and Maintenance
Project	Flume Replacement Project
ROW	Right-of-Way
SQMP	Stormwater Quality Management Plan
Study	Flume Replacement Alignment Study
UAS	Unmanned Aerial System
USACE	United States Army Corp of Engineers
VID	Vista Irrigation District
WSPS	Water Supply Planning Study



Section 1

Introduction and Planning Objectives

Vista Irrigation District (District) has contracted the Brown and Caldwell (BC) team to conduct the Flume Replacement Alignment Study (Alignment Study). This work follows the recommendations of the Water Supply Planning Study (WSPS) which evaluated options for either replacing or retiring the Vista Flume (Flume), known then as the *“To Flume or Not to Flume”* evaluation. In March 2020, the WSPS presented to the District’s Board found that the To Flume option was the more favorable long-term solution; it is the least costly option for the District, providing superior supply reliability and affords the opportunity for continued regional cooperation with neighboring agencies.

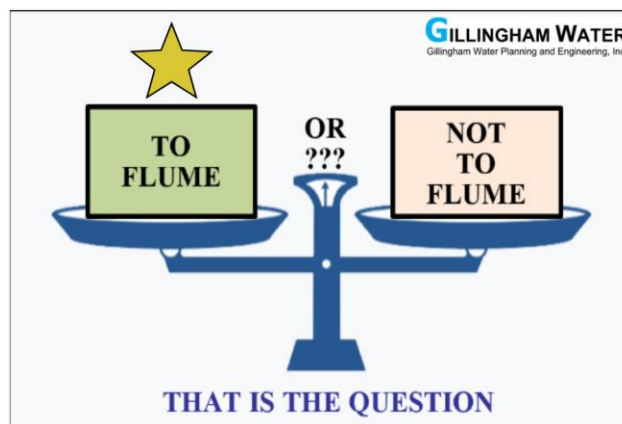


Figure 1-1 – To Flume or Not To Flume Scale; WSPS Workshop #3

The Alignment Study seeks to answer the question, *“How to Flume?”*. Presented herein is the work performed to date in the initial effort to answer this question. The Alignment Study team has thus far:

1. evaluated a reasonable range of corridors for the Flume replacement project,
2. found a total of six alignments recommended for coarse screening,
3. developed the preliminary evaluation criteria for coarse screening,
4. inspected the Flume by drone to confirm the timing and prioritization of retiring the Flume, and
5. completed an affordability check confirming the decision “To Flume” is still the correct decision.

1.1 Background and Purpose

The Flume, as shown in red in **Figure 1-2**, is an integral component of the District’s water supply system, conveying the District’s local (Lake Henshaw) and purchased (Water Authority) raw water treated at the Escondido-Vista Water Treatment Plant (EVWTP) to Pechstein Reservoir. The Flume consists of above-grade unpressurized gunite bench structures (benches), buried pressurized steel or concrete pipelines (siphons), and an unpressurized rock tunnel. The Flume has provided multiple generations of District customers with local water over its impressive, nearly 100 years of service; however, it has reached the end of its useful life.

The purpose of the Alignment Study is to identify, from among a broad range of alternatives, a preferred alignment and configuration for a project to replace the Flume and provide reliable service for the next 100-years.

This study will develop multiple alignment alternatives for replacing the existing Flume, select the preferred alignment, and prepare conceptual design documents describing the approach for executing the future Flume Replacement Project (Project). This work will focus on addressing:

- feasibility and cost-effective construction,
- reliability,
- environmental effects,
- long-term operations and maintenance (O&M), as well as
- affordability, impacts to rates, and funding options.

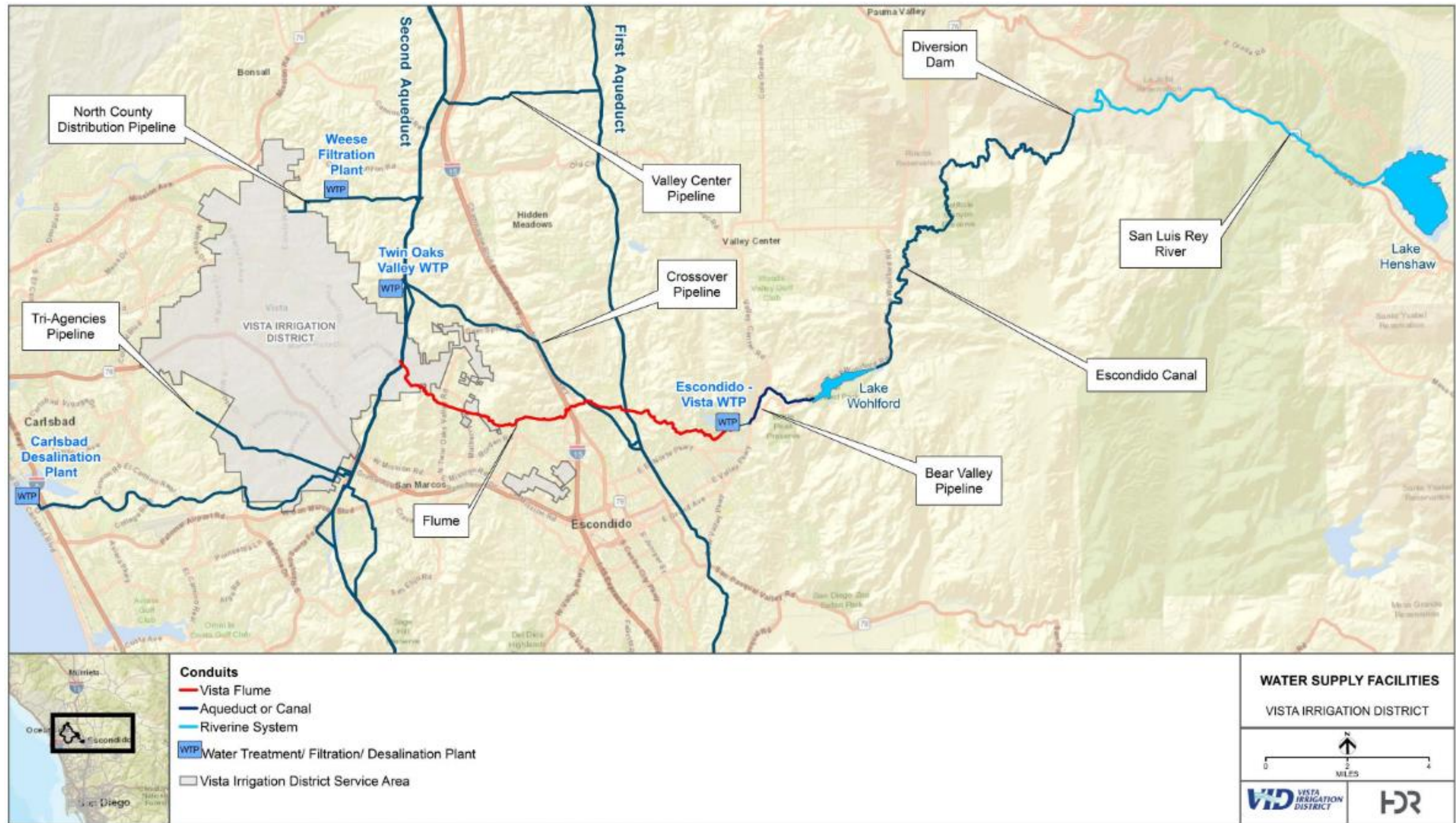


Figure 1-2 – Regional Water Supply Facilities; 2016 VID Master Plan

1.2 Planning Objectives

The Alignment Study's goal is to develop a plan to identify the future Project that will convey high quality water from the District's local water resources to its customers in an economically (highest reliability at the lowest cost) and environmentally responsible way. To meet this goal, the following success factors and planning objectives were created to guide the Alignment Study:

Success Factors

Critical factors for the success of this Alignment Study include:

- Consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation, per California Environmental Quality Act (CEQA) Guidelines, through a comprehensive alternatives evaluation process.
- Avoid surprises related to feasibility or cost that unexpectedly tips the scale on the "To Flume or Not to Flume" decision by regularly tracking pertinent cost data and preparing more detailed construction cost estimates.
- Support the District's decision to replace the Flume by presenting a clear project roadmap in a preliminary design report that includes a project funding plan for the preferred alignment.

Planning Objectives

The Alignment Study's planning objectives serve as the roadmap for delivering a successful plan, and are as follows:

1. **Alignment Criteria and Alternatives Evaluation:** Develop custom criteria to aid in alignment preference, including cost, reliability, water quality, environmental protection, constructability, accessibility, existing water supply obligations and assets, EWTP operations, phasing and funding opportunities, regulatory compliance, and hydraulic constraints. With the criteria established, develop and evaluate multiple project alignment alternatives for replacing the Flume.
2. **Funding Support:** Accurately estimate the cost of construction and identify funding opportunities available to the District. Linking costs and funding (i.e., low-interest loans, grants, and cash funding) to quantify the true cost that the Project will have on ratepayers.
3. **Project Affordability Checks:** Continue testing the affordability of the "To Flume" Project against the "Not To Flume" option. The intent is to check that the "To Flume or Not To Flume" balance scale has not tipped during the course of this Alignment Study in a manner that reverses the decision made during the WSPS. If the scale ever does tip, the Board may wish to consider an off-ramp.
4. **Assess Potential Environmental Effects:** Throughout the Alignment Study, evaluate potential environmental effects alignment alternatives may have and the necessary mitigation measures needed in order to recommend the appropriate CEQA/National Environmental Policy Act (NEPA) documentation for the Project.
5. **Convene Multiple Workshops with the Board:** Present clear and transparent information to the Board and the public for their consideration at significant milestones during the Alignment Study. Each workshop represents an important building block, which will form consensus for later workshops throughout the course of the Alignment Study.

1.3 Alignment Study Phasing

The Alignment Study's scope of services is structured into five phases with four Board workshops, as follows:

- Phase 1: Project Initiation
- Phase 2: Long-list of Alternatives and Evaluation Criteria Development (Board Workshop No. 1)
- Phase 3: Coarse Screening Results and Recommended Short-list (Board Workshop No. 2)
- Phase 4: Fine Screening Results and Proposed Project Selection (Board Workshop No. 3)
- Phase 5: Conceptual Design and Affordability Review (Board Workshop No. 4)

1.4 Purpose of Board Workshop No. 1

The purpose of Workshop No 1 is to review the preliminary long-list of alternatives and the process for refining the alignments to the recommended final long-list of alternatives; reach preliminary consensus on the final long-list of alternatives and preliminary coarse screening evaluation criteria; and present an update on cost and affordability changes since the completion of the WSPS.

Section 2

Long-list of Alternatives Development

Summary:

- To show replacement was feasible and a lower cost than retiring the Flume, two alignments were presented in the WSPS (All-New and Hybrid), but these aren't the only two options.
- A segment analysis using geographical information system (GIS) data evaluated 158 unique segments, which combined make up hundreds of possible alignment alternatives.
- The result was six unique alignments recommended for Coarse Screening which represent a broad, yet reasonable, range of project alternatives.

2.1 Purpose for Developing Alternative Alignments

Establishing a reasonable range of project alternatives for informed decision making and public participation.

The WSPS developed two alignment alternatives, "All-new" and "Hybrid." These alternatives needed to span a wide range of possible Flume replacement projects, which included an entirely new pipeline, All-new, versus a project that would rehabilitate portions of the existing Flume as well as install new pipeline, Hybrid. These two alternatives established a reasonable baseline for assessing the high-level feasibility and economic viability of a Flume replacement project, To Flume, versus a sole Flume retirement project, Not-To-Flume. However, when evaluating the implementation of a To Flume project, more than two project alternatives reasonably exist and should be explored.

2.2 Segment Level Analysis - Criteria and Results

Evaluating segments for constructing a new pipeline unlocked hundreds of possible alignment alternatives.

The segment analysis established the practical limits for an alignment of a future Project. Within the extents of the Alignment Study's boundaries, many "segments" were identified as feasible construction corridors for a new pipeline. These segments included corridors of available rights-of-way (ROW), easements, or land where easements could be established. A total of 158 unique segments were identified, whereby linking together these segments unlocked several hundred alignment alternatives. **Figure 2-1** shows all the segments that were identified and evaluated in the segment analysis based on applying the initial criteria to develop a long-list of six alignments for Coarse Screening.

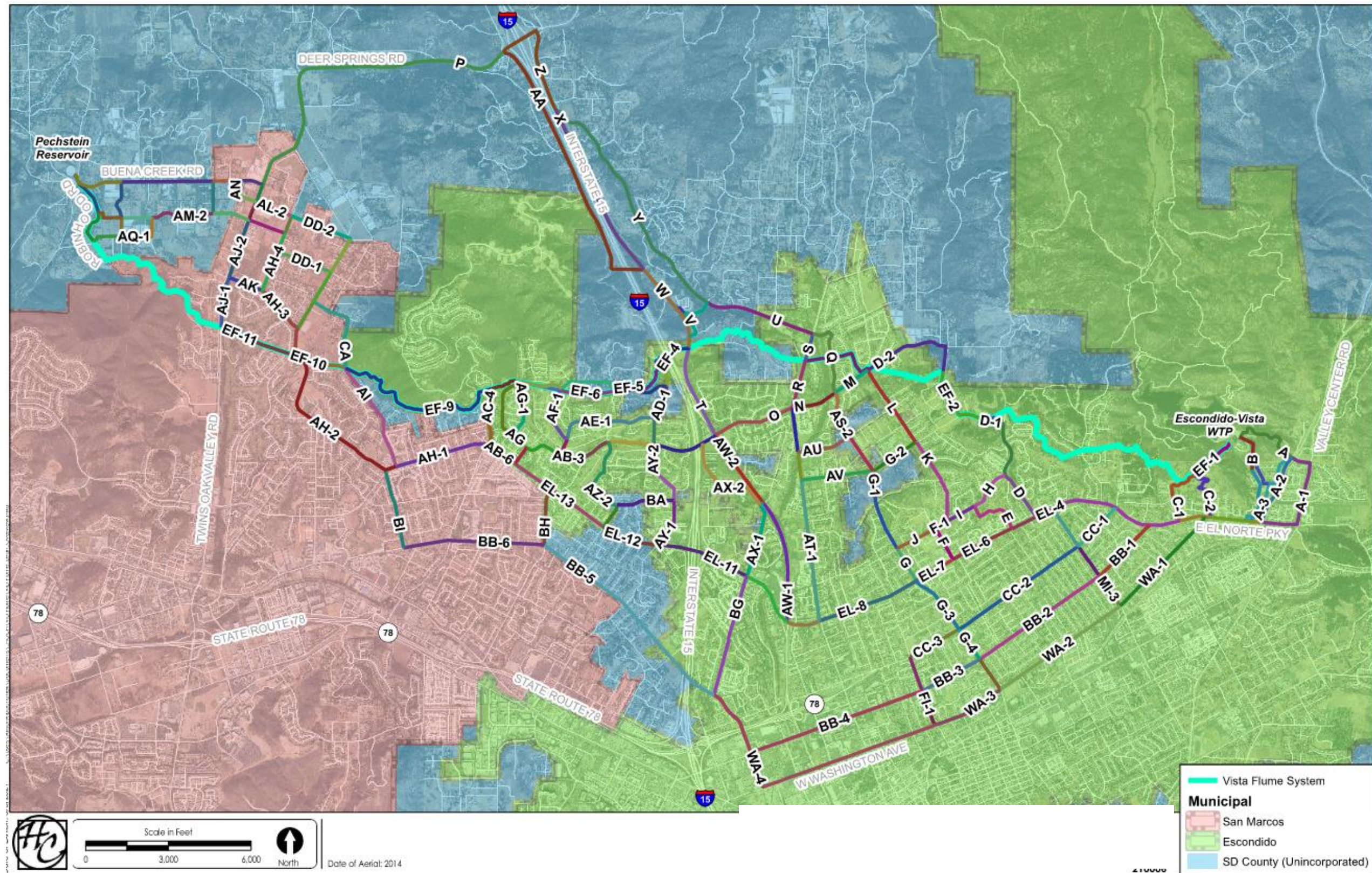


Figure 2-1 - Alternative Route Segments

Applying these initial criteria in GIS established a ranking of the more favorable segments.

Segment-level initial criteria were defined using a total of 26 Geographic Information System (GIS) data layers. For example, these data layers were used to assign a score to each segment by evaluating whether it intersected an area of special consideration, such as environmentally sensitive areas or areas containing hard rock. **Table 2-1** below identifies all the criteria, or special considerations, which were used in this analysis to establish segment scoring.

Table 2-1. Binary Segment Evaluation Criteria & Groupings (unweighted)		
Criteria Group	Criteria (Special Considerations)	Raw Score
Land Ownership	Easements/Right-of-Ways	1
Significant Community Impacts for Linear Projects	Traffic Impacts Impacts to Critical Facilities	5
Constructability	Use of Existing Assets Liquefaction High Groundwater Slope Stability Hard Rock/Rippability Trenchless Technologies/Tunneling Potential for Major Utility Conflicts/Crossings	9
Environmental	Drainages/Crossings Potential to Disturb Biological Resources Known Previous Soil Contamination	5
Permitting	Interagency Coordination Biological/Resource Agency Permitting Traffic Control	5
Operations and Maintenance	Accessibility	1
Total Available Score:	-	26

A total of 158 segments were evaluated using the above criteria, binary scores were defined such that a score of 1 indicated more favorable conditions along the segment, whereas a score of 0 indicated less favorable conditions. The total scores for each segment helped rank and prioritize the segments relative to each other. The results, as depicted in **Figure 2-2** below, show the more favorable segments in blue and green versus the less favorable segments in orange and red.

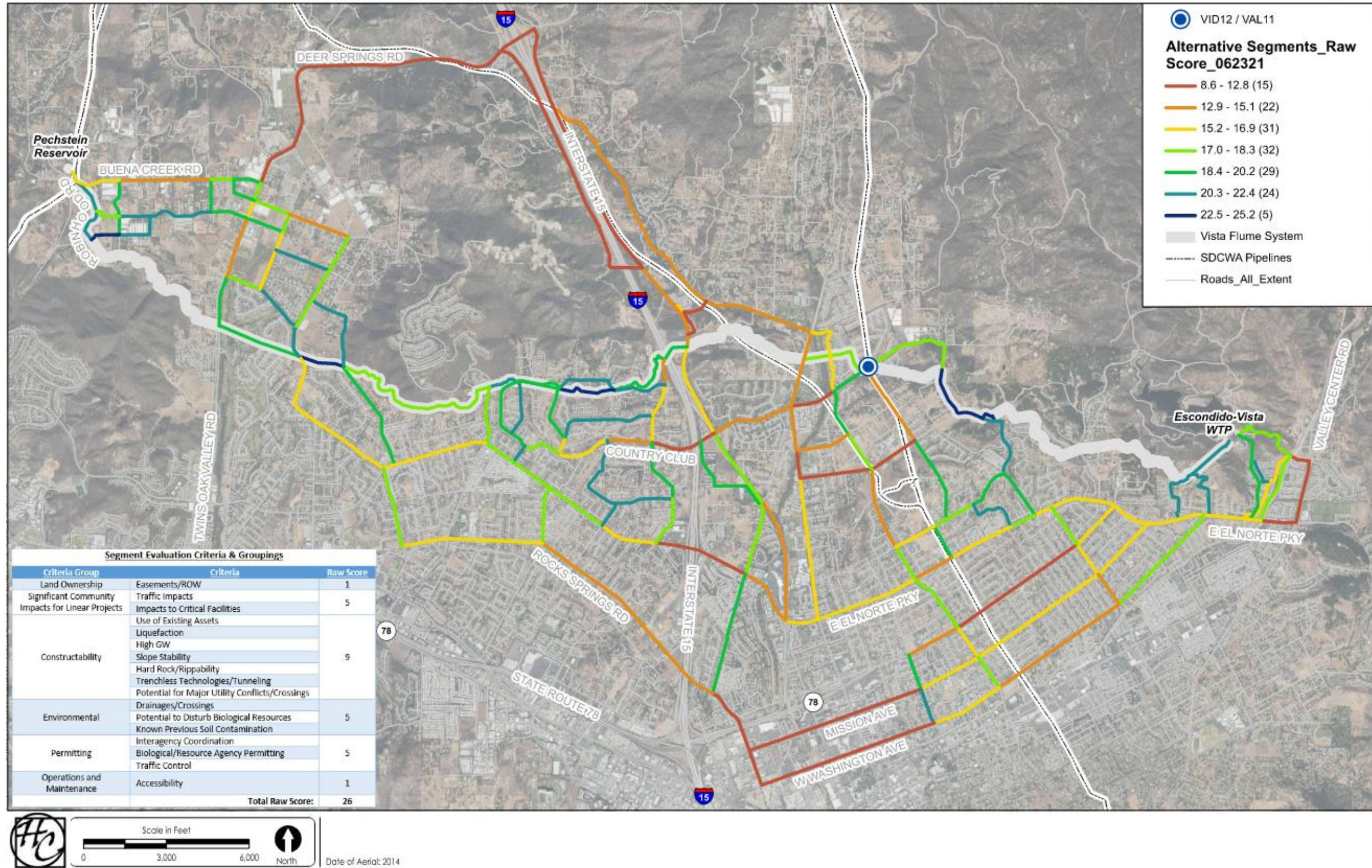


Figure 2-2 – Alternative Segments Raw Scores

2.3 Proposed Alignments – Recommended for Coarse Screening

Linking together the more favorable segments helped reduce hundreds of alignment options down to six core alignment alternatives.

The six alignments developed for this Alignment Study are shown in **Figure 2-3** and compared side-by-side below in **Table 2-2**. The figure also includes boundaries delineating Eastern, Middle, and Western corridors. Portions of the full alignments within the Eastern and Western Corridors are considered interchangeable as they intersect common convergence points indicated by the white circles. Therefore, although six individual alignments are depicted on **Figure 2-3**, alignment sections within a corridor may be interchanged later in the study as more data becomes available.

Table 2-2. Alternative Alignments Summary						
	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
	South Central	Hybrid A	Central	Hybrid B	Northern	Southern
Length (mi)	11.7	13.0	12.0	11.9	11.6	11.7
Pumping or Tunneling Required	No	Tunneling	Tunneling	Tunneling	Pumping	No
Direct Connection to VAL11/VID12	No	Yes	Yes	Yes	Yes	No
Phasing Potential	Low	High	Medium	High	Low	Low
Takeaway	A direct route in ROW that pressurizes the Flume and avoids risky & difficult hillsides; avoids Big Tunnel but uses more trafficked corridors	Keeps easements in low-risk areas and entirely avoids easements in risky & difficult hillsides; provides more phasing opportunities	Option entirely in ROW using less congested streets with better options for phasing	Maximizes use of existing easements wherever feasible; provides the most phasing opportunities	Option that minimizes traffic & utility conflicts inherent in other alternatives; requires a new pumping station and construction through adverse geology	A direct route in ROW that pressurizes the Flume and avoids risky & difficult hillsides; uses Big Tunnel and less-trafficked corridors
Pros	<ul style="list-style-type: none"> One of shortest alignments Pressurization without pumping or tunneling Avoids all hillsides 	<ul style="list-style-type: none"> Utilizes low-risk easements Connection to VID12/VAL11 Reuses I-15 crossing High phasing 	<ul style="list-style-type: none"> All in ROW but less congested streets than Alt 1 Connection to VID12/VAL11 Good pressurization & phasing Reuses Baumgartner Siphon 	<ul style="list-style-type: none"> Maximizes use of existing easements Connection to VID12/VAL11 Most phasing Reuses Baumgartner Siphon & I-15 crossing 	<ul style="list-style-type: none"> Shortest alignment Fully pressurized Minimizes some traffic & utility conflicts (east of I-15) Connection to VID12/VAL11 	<ul style="list-style-type: none"> One of shortest alignments Lowest elevation – pressurization without tunneling or pumping Avoids hillsides
Cons	<ul style="list-style-type: none"> Uses more heavily trafficked corridors New I-15 crossing Low phasing No VID12/VAL11 connection 	<ul style="list-style-type: none"> Longest alignment Tunneling req'd thru high points Low head system 	<ul style="list-style-type: none"> Tunneling req'd thru high points New I-15 crossing 	<ul style="list-style-type: none"> Tunneling req'd thru high points Low head system 	<ul style="list-style-type: none"> Highest grade – pumping req'd Adverse geology Low phasing New I-15 crossing Traffic concerns on Deer Springs Rd 	<ul style="list-style-type: none"> No VID12/VAL11 connection New I-15 crossing Low phasing



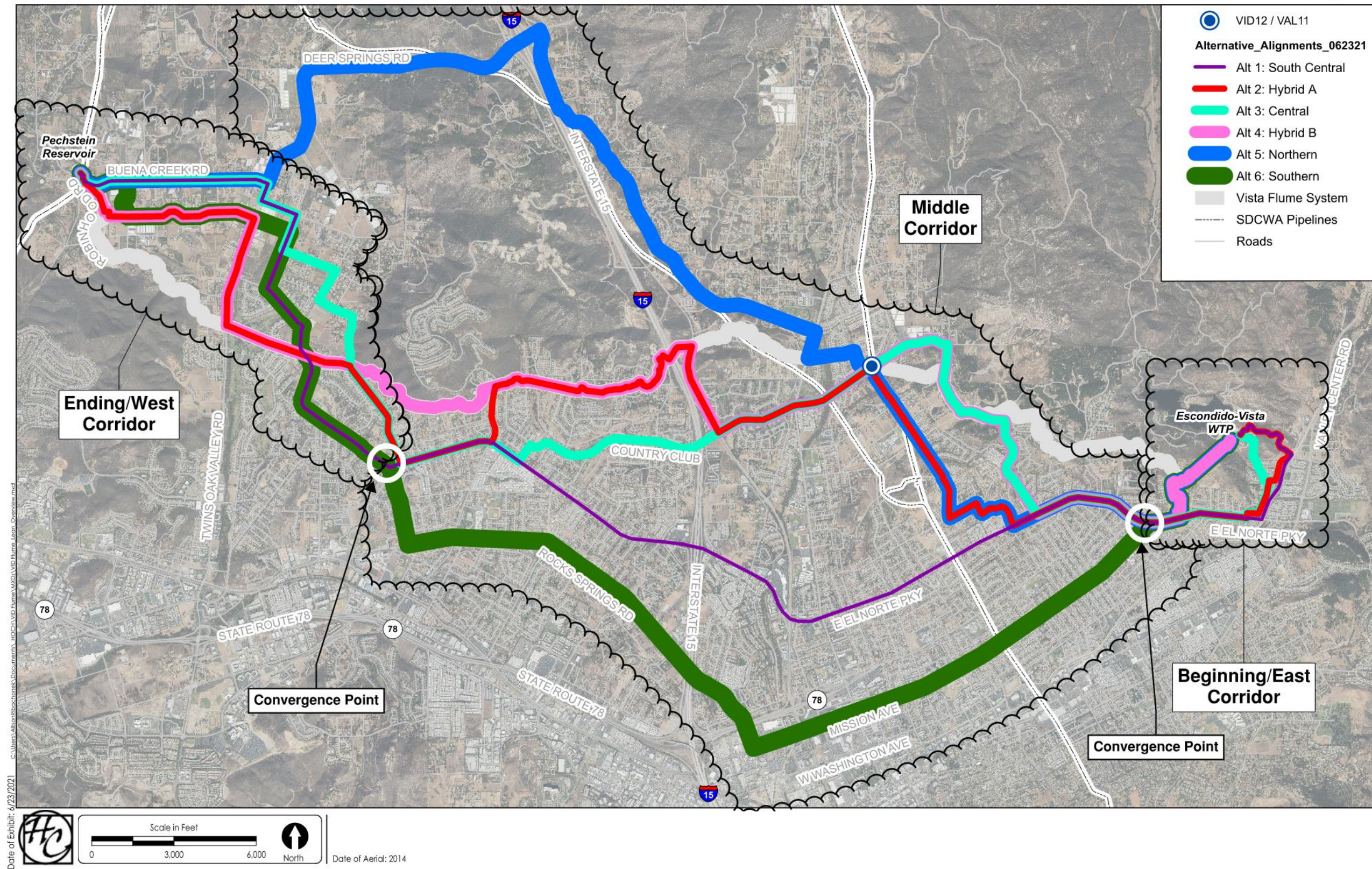


Figure 2-3 - Proposed Alternative Alignments



Section 3

Coarse Screening Criteria Details

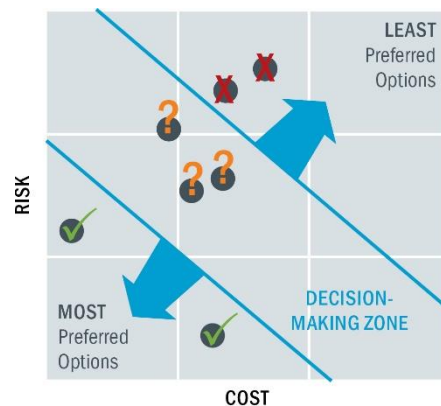
Summary:

- The Study's next step is Phase 3 - Coarse Screening; all alternative alignments will be evaluated, and a recommended "short-list" will be developed.
- Coarse Screening will use a "Risk vs. Cost" approach for grouping and assessing the evaluation criteria.
- Board Workshop No. 2 will present the results of Coarse Screening and seek the Board's consensus to advance the recommended "short-list" to Phase 4 - Fine Screening.

3.1 Risk vs. Cost Evaluation Approach

Using a graphical Risk vs. Costs approach will lead to a short-list of the most preferred alignments during Coarse Screening.

Whereas the segment level analysis used a binary approach to apply the initial criteria to a given segment, the Coarse Screening (Phase 3) analysis will apply weighting factors to the customized criteria depending on importance to rank each coarse alignment alternative. Utilizing both geospatial data and engineering experience, the Study will quantitatively rank the alignment alternatives against the set of cost and risk-based criteria developed for the Study. The resulting scores will facilitate and support the decision process to determine which alignment alternatives should proceed to Phase 4 - Fine Screening. A sensitivity analysis will be conducted to verify that the weighting factors and criteria are being applied appropriately across the alignment alternatives. The intent of Coarse Screening is not to automate the decision-making process, but rather to reflect objective criteria of costs and risks while leveraging the institutional knowledge of District staff. The draft criteria prepared for Coarse Screening are presented below in **Section 3.2**.



3.2 Draft Evaluation Criteria

Custom evaluation criteria are currently being developed for the Alignment Study; below is a draft criterion for use in Phase 3 - Coarse Screening.

A set of key criteria has been developed, and is currently undergoing refinement, to evaluate the costs and risks of various alignment alternatives. **Table 3-1** below outlines the key criteria groupings and lists all criteria subcomponents recommended for the Alignment Study. Each criteria category will be assigned a weighting factor that aligns with the top priorities of the District.

Table 3-1. Criteria Groups for Coarse Screening Evaluation		
Categories	Criteria Groups	Criteria
Project Delivery	Project Affordability and Implementation	Capital Cost Factors O&M Cost Factors Boot and Bennet Mitigating Revenue Reduction (purchase from other agency) Rate Impacts/District-Funded Portion Grant/Funding Opportunities
	Schedule and Risk	Schedule Factors Phasing/Sequencing
	Constructability	Geology Crossing/Construction Methods Alignment Length Additional Piping Upgrades for Boot and Bennett Service Areas Tunneling for Topographic Peaks
Stakeholder Coordination	Community Impacts	Traffic Impacts Impacts to Critical Facilities
	Land Ownership	Easements/ ROWs Land Acquisition
	Environmental	Biological Resources Areas of potential soil contamination Cultural Resources CEQA
	Permitting	Interagency Coordination Cal DFW/USACE Coordination DDW Coordination Stormwater/SQMP
System Reliability	System Hydraulics	Pressurization vs Low-Head Impacts to Transient Flow Impacts to EVWTP Operations Pumping Stations Flow Control
	Operations and Maintenance	Accessibility Long-Term Vulnerability Agency Service Connections VID Service Connections Operational (Hydraulics) Operational (Water Quality) Future Adaptability/Redundancy



Section 4

Cost and Affordability Check-in

Summary:

- Both the costs of materials and labor have escalated significantly since the pandemic. Although the market is showing signs of leveling-off, there are no signs of a decline.
- Market pricing as of July 2021 shows the cost to construct Flume Replacement projects presented in the WSPS has increased by up to 30 percent since March 2020.
- Costs for the Not to Flume option have increased by at least as much as the To Flume option, meaning the Flume balance scale continues to favor the To Flume option.

4.1 Project Costs have Increased

Both construction materials and labor prices have been highly variable and have increased significantly since the start of the COVID-19 pandemic. Below is an excerpt from the Engineering News Record’s (ENR’s) April 2021 publication on Construction Economics reporting monthly variabilities in costs with observed annual escalation rates ranging from 3.8 percent to 14 percent.

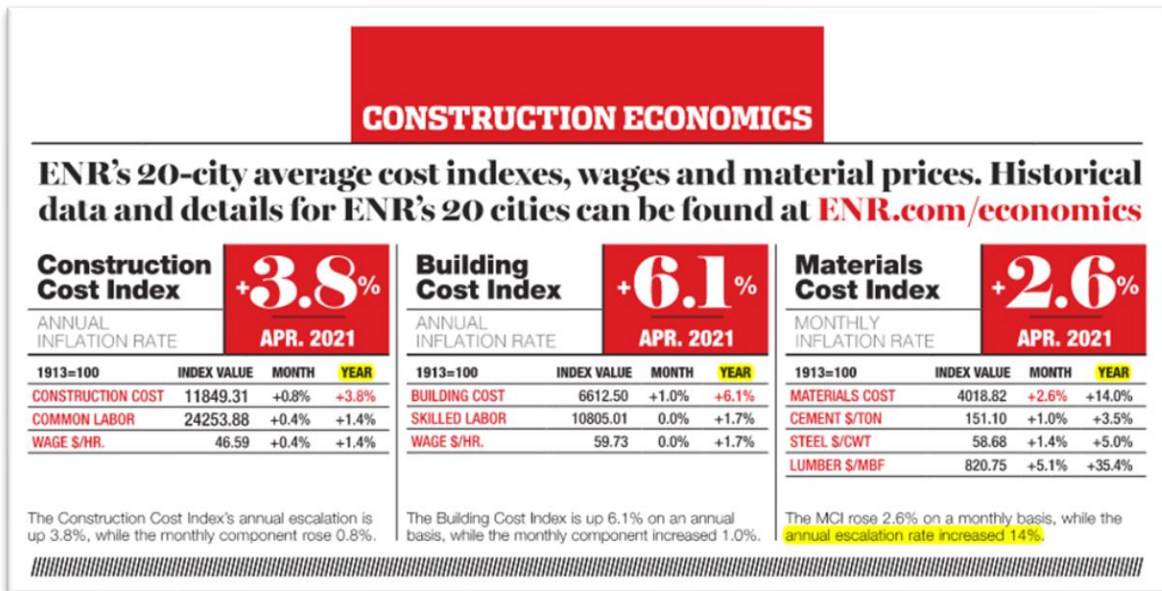


Figure 4-1 – Engineering News Record’s Construction Economics, April 2021

4.2 Current Market Price of the Flume Replacement Project

During July 2021, the Alignment Study team updated the cost estimates prepared during the WSPS using current market unit pricing. We found the total Project cost have increased significantly since the final WSPS Board Meeting held in March 2020, by approximately:

- 18 percent over the \$120M estimate for the All-new Pipeline option, and
- 28 percent over the \$130M estimate for Hybrid option, rehabilitate existing siphons and all-new pipeline for bench sections.

Considering the above, we are currently anticipating a net increase ranging between 15-30 percent and will continue to monitor the escalation of costs closely for the duration of this planning study. Planning level cost estimates will be developed for each of the six alignment alternatives presented herein during Phase 3 – Coarse Screening; the cost estimates for the six alignments will be presented to the Board at Workshop No. 2.

4.3 Affordability Check-In: To Flume or Not to Flume?

With the increase in project costs described above, it becomes prudent to return once again to the WSPS's balance scale, weighing the merits of the To Flume option with those of the Not To Flume option. Briefly, our preliminary review indicates the costs for the Not to Flume option have increased by at least as much as the To Flume option, with the result being that for now, the Flume balance scale continues to favor the To Flume option.

Increased costs on the Not to Flume side of the balance scale include the following:

- Water Authority Purchases: Net present value costs have increased for purchasing additional water from the Water Authority to replace the District's local water supply. In August, the Water Authority presented the draft results of its Long-Range Financing Plan, including a rate forecast indicating an average increase over the next ten years of approximately 5.5 percent per year. This is considerably higher than the rate escalation assumptions utilized in the WSPS. For this interim update, we have increased the escalation assumptions to match the Water Authority's ten-year forecast.
- Boot and Bennett Transfer: District staff now believes the transfer of the Boot and Bennett service areas to the Vallecitos Water District will incur higher annexation, capacity, and infrastructure transfer fees than assumed in the WSPS.
- Delivery Reliability Mitigation: The WSPS assumed delivery reliability to the District absent the Flume would be mitigated in part by the Water Authority's planned installation of an isolation valve in Pipeline 4, sufficient to allow the Twin Oaks Valley Water Treatment Plant to operate during treated water shutdowns from Metropolitan Water District. The Water Authority has now deferred the isolation valve project to Fiscal Year (FY) 2032. As a result, additional mitigation will be required in the form of supplemental storage reserve in the District's planned Pechstein II treated water reservoir project.

On the To Flume side of the balance scale, in addition to the increased construction costs for the Project, costs have increased for treatment of local water due to increased chemical costs as well as for allowances for additional costs arising from the management and treatment of cyanobacteria, or Harmful Algal Blooms (HABs).

The above preliminary findings were made by revisiting the 30-year present-worth cost analysis performed for the WSPS, which showed that the To Flume option had a \$110 million dollar cost advantage. In factoring in the above changes, including a cost allowance of \$375,000/year (District's portion, other half paid by the City of Escondido) for HABs testing and treatment, the To Flume cost advantage increases to \$120 million. A second analysis assuming a 20 percent reduction in local yield, whether caused by HABs or other issues, still shows a To Flume cost advantage of \$70 million.

The project team will report on these preliminary findings in more detail during Workshop No. 1. It is important to note that work to understand and mitigate HABs is ongoing and the long-term impacts

on the availability and cost of local water is not yet understood. A more in-depth evaluation of the issue will be performed during Coarse Screening as additional information and data becomes available.



Section 5

Condition Assessment Update

At roughly 95 years old, the Flume has exceeded its usable service life

The typical design life for this type of asset is 50-75 years, while the actual age of this asset is over 95 years; the Flume is well beyond its anticipated useful service life. The bench section inspection along the Flume and discussions with District staff reaffirms this; there are numerous repaired sections, holes, staining, possible leaks (exfiltration), repeated roof/wall separation repairs, roof/floor structural concerns, required increased maintenance and no longer functioning as new. The asset will continue to deliver water, but will be more costly to operate, less efficient, and has a higher risk of failure. The risk of failure will continue to increase as the asset degrades until replacement is performed.

5.1 Purpose for Inspecting the Bench Sections

A qualitative condition assessment of the bench sections established a recent baseline for assessing the priority for replacement and helped identify project phasing opportunities.

In April 2021, an external visual inspection of the Flume bench sections was performed using an Unmanned Aerial System (UAS), or drone. The inspection provided data necessary for establishing a more recent baseline condition of the bench sections. The significant defects, which were documented in an inspection defect and repair recommendations log, were developed based on the type, severity, and quantity of defects observed for each bench section. These recommendations were based solely on the exterior defects of the Flume visually observed from the drone footage; interior conditions of the benches are unknown and may vary greatly.

The purpose of this work was to enhance the alignment alternatives development by providing a better understanding of the necessary timing requirements for replacement when phasing is considered for each reach of the future Project.

5.2 Bench Section Inspection Results

Prioritization levels, alternatives development and identifying project-phasing opportunities based on qualitative condition assessments.

The drone inspections, along with input from District staff on repair and maintenance needs for each bench section, helped establish bench replacement prioritization for a potential phased, hybrid alignment option. Prioritization levels were assigned to each bench section as shown on **Table 5-1** and **Figure 5-1** below. The prioritization levels assigned include: 1 (very poor), 2 (poor), 3 (fair to poor), and 4 (fair) conditions. Prioritization level 1 bench sections should be the first to be replaced, followed by prioritization level 2, 3, and lastly prioritization level 4.

Table 5-1. Replacement Prioritization		
Flume Bench Section	Approximate Length (LF)	Prioritization Level*
Jack Creek Bench	394	3
Tunnel Bench	3,750	3
Daley Bench	3,241	2
Kornhauser Bench	1,321	3
Finkbinder Bench	3,888	2
MD Bench	3,290	2
Pearson Bench	371	3
Beehive Bench	477	1
Borden Bench	6,265	1
Twin Oaks Bench	5,135	1
MW Bench	2,173	4

**Prioritization Level*

1 = Very Poor

2 = Poor

3 = Fair to Poor

4 = Fair



Section 6

Conclusions

The work performed in Phase 2 – Long-list of Alternatives and Evaluation Criteria Development, as presented herein, constitutes the first major step in this Alignment Study. The key findings of this work will shape the next phase of the Alignment Study, Phase 3 – Coarse Screening Results, Project Affordability, and Recommended Short-list. Below is a summary of the four major conclusions resulting from Phase 2:

1. Six (6) alignments have been developed which define a reasonable range of project alternatives and are recommended for Coarse Screening.

The WSPS presented two alignment alternatives to show replacement was feasible and at a lower cost than retiring the Flume. However, when evaluating the implementation of a “To Flume” project more than two project alternatives reasonably exist. This Alignment Study has developed six alignment alternatives that have been recommended for Coarse Screening, see **Figure 2-3**. These alignments represent a broad, yet reasonable, range of project alternatives needed to select a preferred alignment while supporting the subsequent environmental documentation phases of the Project.

We will proceed to evaluate the six alignment alternatives presented in **Figure 2-3** using the criteria listed in **Table 3-1**. We will return to the Board during Workshop No. 2 (Phase 3) with a shortlisting of alignments recommended for advancement to Phase 4 – Fine Screening Results and Proposed Project Selection.

2. Costs have risen since the WSPS and there is no sign of decline; however, the decision “To Flume” continues to be the economically preferred alternative than “Not To Flume.”

Market pricing as of July 2021 shows the cost to construct the Flume Replacement projects presented in the WSPS has increased by up to 30 percent since March 2020. Costs for the Not to Flume option have increased by at least as much as the To Flume option, meaning the Flume balance scale continues to favor the To Flume option.

We will develop estimated construction costs for each of the six alignment alternatives presented herein and return to the Board during Workshop No. 2 with another “To Flume or Not to Flume?” affordability check-in using the newly developed estimates.

3. More condition assessment confirms retiring the Flume remains a high priority and establishes a recommended order of priority for its replacement.

The exterior drone inspection of the Flume’s bench sections concluded that although the asset will continue to deliver water, it will become more costly to operate, less efficient, and will increasingly have a higher risk of failure, particularly in the locations noted on **Figure 5-1**. While the Flume has served the District remarkably well for over 95 years, the time has come to prioritize its replacement.

We will continue to use the drone inspection data to inform potential phasing opportunities for replacing the Flume and return to the Board during Workshop No. 2 with recommendations as to whether phasing a Project remains viable.

4. As costs continue to increase, and the priority of replacing the Flume heightens, so does the likelihood of requiring financing; advancing financial planning efforts for this project would be prudent.

It appears increasingly likely the Project will require some amount of capital financing. At the conclusion of the WSPS, several next steps were recommended. One of those recommendations included developing financial plans for funding a project. We recommend the District consider finance planning sooner rather than later in order to be prepared for the likelihood that capital financing will be required. We also recommend that the financial planning be conducted in tandem with the ongoing Alignment Study and subsequent project design and environmental documentation phases so that real time project details can be incorporated into the financial plan as the project becomes better defined. This approach should lead to more accurate financial planning and allow the District to be better positioned for a variety of potential funding options.

For Workshop No. 2, we will prepare a discussion related to project affordability, funding opportunities, prioritization within the District's Capital Improvement Plan (CIP), and next steps for preparing the District in securing financial assistance may it be through grants or loans.